A project entitled

The Effects of the International Baccalaureate Diploma Programme on Schools:

A Systematic Review of the Literature

by

Chelsea Androschuk

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Abstract

The International Baccalaureate (IB) Diploma Programme (DP) is a rigorous secondary curriculum offered in schools around the world. In Canada and the Unites States, the IB DP often runs additional to local curricula, is viewed as an added challenge, and is often treated as a high achievement program. Despite the popularity of the IB DP, its overall effects on schools and their populations remain only partially understood. This systematic review of the IB DP literature has the purpose of answering two questions. One, to what extent have the effects of the IB DP been represented and discussed in the literature so far? And two, what can we learn about the IB DP in Canada and the United States by looking at the effects of the program that have been studied in the literature so far? Thirty-five papers on the IB DP in Canada and the Unites States were included in this study. These papers were annotated and their findings were coded for the types of effects of the IB DP that they included. These types of effects were qualitatively grouped into themes, and quantitatively analyzed for frequency. Based on the findings, the IB DP seems to positively impact academics and the college experience, but still has potential weaknesses in areas of school climate and non-academics. Issues of access for marginalized groups of students are not yet well enough studied or understood. Schools wishing to implement the IB DP for its benefits should also carefully consider its drawbacks and ensure appropriate supports are in place.

Dedication

I dedicate this work to my grandfather John Androschuk. I believe he spent more time asking me if I was going to take my MCAT than he did doing anything else for a few years. Well grandpa, alas - I am not a doctor. But, given that you were a chemist and a teacher, I feel as though I have ultimately followed in your footsteps. In my work as a chemistry teacher, I am often reminded of you, and hope that I have made you proud. Were you still with us, I would like to think that you would be especially proud of my achieving a Master in Education degree. Wherever you are, this one's for you.

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The Effects of the International Baccalaureate Diploma Programme on Schools: A Systematic Review of the Literature

Introduction

High achievement programs, such as the International Baccalaureate (IB) program, have become widely offered in our Canadian school systems, especially at the high school level (Baluja & Hammer, 2011). In the municipality I work in, virtually all of the high schools offer either the IB Diploma Programme (DP) or the Advanced Placement (AP) program as an option to their students. I currently work in a school that offers two levels of the IB program. We offer the IB Middle Years Programme (MYP) as well as the IB DP, and it would seem that we are not alone. As of February 2016, the IB program is offered in 362 schools across the country, according to the International Baccalaureate Organization (IBO) (IBO, 2005-2016). In North America, there are 2,072 schools offering IB programs (IBO, 2005-2016). Furthermore, these numbers continue to grow. Worldwide, in February 2016, the IB had grown by 46.40% compared to February 2011. It stands to reason that these programs are becoming increasingly popular, and are going to be a reality of the schooling system for a long time to come. So what is compelling schools to offer these programs; why are these programs so popular?

My district is a district of choice, and, in my experience, schools use programs such as the IB DP (and the AP program) as marketing tools in their recruitment of new students. It would seem that students and parents have almost come to expect the option of a high achievement program as part of the high school experience. But having taken IB, having taught IB, and having worked as an IB coordinator, I am often left wondering as to the overall effects of the IB program on our students and our schools. I am particularly curious about the nature of the IB DP

in Canada and the Unites States, when it often runs alongside existing curricula. Running alongside the existing curricula means that a teacher who teaches IB is expected to deliver the locally developed curriculum for their grade or course as well as the curriculum for that grade or course as mandated by IB.

Is this program for everyone? I often see the full IB students stressing about their workload, complaining of lack of sleep, and interacting almost solely with each other. It doesn't feel all that long ago that I had to peel a weeping student off of one of her chemistry tests. She was experiencing such pressure to perform at a high level academically that she had become unable to write a test without breaking down. This student was a full IB DP candidate. She was constantly stressed and overwhelmed by her workload. And yet, she made friendships in this IB program that she may not have made otherwise, and was a part of a group who could relate to her overwhelming desire to be at the academic top. She was clearly benefitting in some ways from the program. But at what cost? Was it worth it in the end? Given this experience, and others, I could not help but develop a strong line of questioning about the nature of how the IB DP plays out in our schools. I also see the IB DP teachers working very hard to prepare to teach their 'extra' content. They are expected to prepare students for an extra set of exams. Furthermore, the IB program requires my school to use a great deal of our resources in training teachers to administer the program; in equipping the students with extra materials relevant to IB; and in paying IB annual registration, evaluation, and assessment fees. Some school districts across Canada require parents to pay as much as $3,000 to send their children to an IB school, while other schools offer the program for free (Baluja & Hammer, 2011). When there are no fees to parents, the cost of running the program comes from somewhere inside the existing school or provincial education budget.

As a result of my experiences, I wonder whether or not we have carefully enough considered the possible effects of the IB DP. Given the fact that the program requires a great deal of resources, but does not include every student, I am often left reflecting on issues of equity and justice. Do the students who wish to access the program have access? Are other programs in IB schools underserved because a large portion of resources gets allocated to the IB program? Are the benefits of the IB DP significant enough to warrant the resources, time, and commitment it demands? I ask: what are the effects of the IB DP on its students? What are the effects on the students who are *not* enrolled in the program but who attend a school that offers the IB DP? How does this program impact staff? Certainly there are benefits to offering the IB DP, but there are risks as well. Given the widespread and increasing popularity of the IB program, it would seem that these questions are worth exploring.

Purpose of the Study

In looking into the existing research on the IB DP, it is clear that some of the effects of the program have been better studied than others, and that significant gaps exist. In order to better understand this topic, the existing literature on the IB DP was searched to establish what effects of the program are known, or have been studied, to date. The purpose of this paper is to establish the extent to which the effects of the IB DP have been represented and discussed in the literature. This was accomplished by conducting a systematic review of the research in this field. This systematic review includes papers that mention some effect of the IB DP on Canadian or American schools. While the IB program is offered throughout the world, the benefits and costs of the program are worth considering in Canada and the United States specifically, as schools in these countries commonly offer the IB program in conjunction with a local curriculum. Additionally, many Canadian and American schools offer the IB DP as a ‘school within a

school' format. This means that some of the students in the school will choose to be IB students, but many will not, and will instead follow the local curriculum in so-called 'regular' classes. This creates possible divisions between those students who are taking IB, and those students who are not, as well as those teachers who are teaching IB, and those teachers who are not.

Despite the fact that the IB program has been around for some time, there are not many articles written on the effects of the program. For the purpose of this systematic literature review, 35 papers were found that could be included in this study. Papers were included if they mentioned an effect of the IB DP on participant(s) $n \geq 1$, took place in Canada or the United States, and were published prior to 2016 (the year of the search). This inquiry included papers of multiple type (as peer-reviewed articles on this topic are not common enough), as well as both qualitative and quantitative studies. It is my recommendation that, moving forward, more quantitative and mixed method papers be published on this topic, as not many exist, especially when considering the non-academic impacts of the program.

This review will include an analysis of the frequency with which each 'effect' presents itself in the literature. The findings of each paper were coded for the effects that they contained. The codes were categorized by type. The frequency of each type of code was analyzed for the purposes of discussion.

It is my hope that this systematic review of the existing literature can accomplish two things. One, that it will offer a better understanding of what has and has not been studied thus far in terms of the effects of the IB DP on schools and their populations. And, two, that this review will help to describe, and clarify, the major effects of the IB DP studied so far in the literature, so that schools can take a more informed approach in their implementations of the IB DP.

In summary, this paper will explore two questions:

- To what extent have the effects of the IB DP in Canada and the United States been represented and discussed in the literature so far?
- What can we learn about the IB DP in Canada and the United States by looking at the effects of the program that have been studied in the literature so far?

Paradigm

I believe that there are certain things that we can learn about our reality as people. For me, the ability to conduct a study and believe that we can learn things makes life more interesting. It means that we have the ability to understand various parts of our reality, and therefore that we can learn and grow in response to those understandings. I am also aware that we are limited as researchers in our ability to access this reality. No study will every properly address everyone, and every study is bound to be flawed, usually in multiple ways. Having been a student of science, I appreciate our ability as people to investigate our natural world, and learn about how and why things happen. I am always astounded by what modern medicine, biology, and chemistry in particular have accomplished for humanity. I realize that this probably means I am of the post-positivist orientation in my thinking, and I believe that this tends to inform most of my decisions when it comes to inquiry. Having said that, I do believe that there are other ways of thinking and other ways of knowing that are extremely valuable, and that often challenge my way of looking at the world.

This paper will take a post-positivistic approach to surveying the existing literature on the IB DP. This summary of the existing literature on the effects of the IB DP attempts to present all of the sides and interests as best as possible. In doing so, I believe that some important patterns

or trends emerged. I call these important because I am hopeful that the findings will create meaning for other researchers interested in the field of IB, and also that they might provide some fresh insight about the IB DP for teachers currently working in this area. I chose to code the literature based on the IB DP 'effects' present in each paper because I believe that the incidence to which an effect has so far been studied will help us to understand its importance to the current scholarship, as well as offer us insight into which areas require more attention.

Papers utilizing both qualitative and quantitative research methods were included in this systematic literature review. An effect was considered even if the affected sample size was n = 1, despite the fact that questions of generalizability and transferability will surely arise from this fact. This was done because there is a lack of quantitative and mixed methods research representing generalizable trends in this field.

When trends strongly emerge in scholarship, they are likely important enough to warrant consideration. These trends can probably tell us something about how our world works, and can often at minimum offer us the opportunity to more carefully or more critically consider something in our world. I hope that this review of the literature is able to demonstrate some evidence of the trends in this field, so that a more critical consideration of the IB DP can occur in schools.

Background or Context

Given that the entirety of this project will systematically review the literature, a traditional literature review will not occur at this time. Instead, the background and context of the IB DP in Canada and the United States will be further discussed.

Description and History of the IB DP

As of February 1, 2016 there were 5,578 schools worldwide offering the IB DP (IBO, 2005-2016). These schools exist in 143 countries (IBO, 2005-2016). The fact that the IB DP has become such a global phenomenon is a testament to its popularity, so what is it and where did it come from?

According to its website, the IB DP is "an assessed programme for students aged 16-19. It is respected by leading universities across the globe" (IBO, 2005-2016). The IB DP works by having students follow a course in each of six subject groups. These subject groups include language and literature (English), language acquisition (a second language), individuals and societies (social studies), sciences, mathematics, and the arts (IBO, 2005-2016). According to the IBO, students who wish to take a second course in the sciences, individuals and societies, or the languages, may opt out of their arts course and still meet the requirements of the program. These courses are offered at either the higher level (HL) or the standard level (SL) (IBO, 2005-2016). The IBO requires students to take either three or four of their courses at the HL. The key differences between HL and SL courses are the number of instructional hours required in each (HL requires more), and the amount of content that is presented in each (HL presents more).

At least one University in my area recognizes the earning of final grades of 6 or 7 (IB assigns final grades are out of 7 marks) as qualifying for transfer credit (University of Alberta, n.d.). Earning transfer credit means that a student can earn credit in his/her introductory courses

without having to take those introductory courses. Some institutions only award credit for HL IB courses, but some accept SL courses as well. Transfer credits are promoted, at least in my school, as a way to save time and money. I myself was able to earn introductory-level university arts credits for my completion of IB DP French when I was a high school student. This saved me from completing one of my arts options for my first Bachelor's degree, which was in science.

The IB assessment is rigorous, and involves some internally assessed pieces (by the teacher of the course), some externally assessed pieces (by trained evaluators hired by the IBO), and a set of final exams (these are externally assessed) (IBO, 2005-2016).

The requirements that have just been outlined describe the nature of the program for a *full* IB DP student. These are students who wish to earn the IB Diploma. I should note here that many students choose to earn one or more IB certificate(s) by taking one or more IB subject group course(s), but not all of them. In my school we often term these students *partial* IB students. Partial IB DP students may still earn transfer credit in their chosen subject groups at select universities.

Additional to the subject requirements in the IB DP, full IB students must comply with participation in what are known as the three core (IBO, 2005-2016). These include the Theory of Knowledge component (a course on its own, as well as a set of outcomes embedded in the subject group curricula, that focuses on the nature of knowledge); the Creativity, Activity, and Service component (which includes a project that encompasses those three criteria); and the Extended Essay (in which students explore an independent and self-directed piece of research and compile a 4000 word report).

The concept of IB originated in 1968 as a program that would work for students who needed to be internationally mobile (IBO, 2005-2016). The program was conceived to offer students the ability to apply to post-secondary institutions, no matter where they had studied in the world, given that they would have experienced a common curriculum and set of assessments.

The spread of the program did not take very long after that. In 1970, the first official set of IB exams was written (IBO, 2015). Throughout the 1970's, many different schools in many different countries adopted the program, and in 1975, the North American Regional Office of the IB was opened in New York City to better serve the Americas (IBO, 2015). By the early 2000's, there were 1000 IB schools around the world (IBO, 2015). Since then, in a relatively short period of time, the number of IB schools has grown tremendously, reaching 5,578 as of February 1, 2016, as reported earlier (IBO, 2005-2016).

Given that it currently exists in so many schools and countries, the success of the IBO in marketing this educational program on a global level is obvious. In fact, the IB claims that the DP offers more than just a rigorously assessed curriculum to its students. Their mission statement is as follows:

> The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.
>
> To this end the organization works with schools, governments and international organizations to develop challenging programmes of international education and rigorous assessment.

> These programmes encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right. (IBO, 2005-2014).

Based on this mission statement, the IB DP is intended to develop a person's character, their skills, and their attitudes, in addition to the knowledge components of the program.

The IB DP in the Canadian and American School: Meeting the Need for a High Achievement Program?

It is clear that the IB DP purports to have a great many benefits for students. However, it is interesting that we choose to offer it in so many Canadian and American schools when most schools in these countries follow a provincially mandated, or state mandated, locally developed curriculum. In other words, schools are adding the IB DP curriculum and set of expectations to their own curriculum and set of expectations. Why is this being done? What purpose might it serve?

While the first schools to adopt IB were international schools populated by students looking for the recognition of a curriculum by universities back home, it has since been adopted by many Canadian and American schools due to its academic rigor, its international status, its recognition by post-secondary institutions, and the demand made by parents and students, at least according to the IBO (IBO, 2005-2016). Callahan (2003) suggests that programs such as the AP and the IB may have been introduced into schools to provide an option for the academically gifted. In fact, the IBO initially marketed the IB DP to academically gifted students (Callahan, 2003). According to IB North America in the 1980's, the IB program was "a rigorous pre-university course of study, leading to examinations, that meets the needs of highly motivated and academically gifted secondary school students" (as cited in Callahan, 2003, p. viii). IB has since

evolved to use a more inclusive approach to marketing to students: "the International Baccalaureate (IB) Diploma Programme (DP) is open to any student aged 16-19. There are DP students all over the world" (IBO, 2005-2016). The notion that the program is intended for any student is a nice one, but it is often still the academically inclined students who choose to follow the program due to its academic rigor and level of difficulty. In my school, the IB DP is still used very much as an option for the academically gifted students.

Providing options for the academically gifted, or creating homogeneous ability groupings, has been something that schools have attempted to do in various formats for years (Goldberg, Passow, & Justman, 1966; Lucas, 1999). Some of those options have included using in-class ability groupings or streaming (tracking) to provide similarly-abled students a variety of supposed benefits (such as working at their appropriate paces, covering or not covering extension materials, using or not using higher level thinking skills, etc…) (Collins, 2007). While there seem to be advantages to ability grouping, there is also a large body of literature suggesting that it might have little benefit (or no benefit) to the advanced and the gifted, and that it might actually impede the learning of lower-ability groupings (e.g., Collins, 2007; Oakes, 1987; Slavin, 1987). Whether or not ability grouping is a good thing or a bad thing, it will likely persist in one form or another, as it stems from underpinning philosophies about how to approach diversity in education, and philosophies take a great deal of time to change (Oakes, 1987).

The IB DP is a unique example of streaming based on ability level. In many cases of streaming, students are grouped based on ability within the confines of the same curriculum. In other words, they are grouped with similarly-abled peers, but to learn the same content, and often even be assessed in the same ways. The IB DP, however, not only results in students being grouped within a school by ability level (with the most academically inclined students found in

the IB DP stream), but also results in those students who are in the IB DP stream being required to learn additional content, and undergo additional assessment. Students enrolled in the IB DP are not exempt from their local curriculum, but rather complete both sets of exams, and learn both sets of outcomes. This might be perceived as contributing to the challenge that IB offers these students, and is largely the reason why many students and parents feel that IB is a better preparatory route for post-secondary entrance than completing the regular curriculum alone: they do a bunch of extra stuff.

The IB DP also often runs as a school within a school. This means that students who are enrolled in the IB DP follow the program in a school where many other students are simply following the locally developed curriculum. These students have different classes, sometimes follow different timetables, and often even have different teachers than the other students.

It is the fact that offering the IB DP in Canadian and American schools often results in the enrolled students following two sets of curricula and taking two sets of exams that makes it a unique example of ability streaming. It is also unique in many cases because of its 'school within a school' design. For these reasons it merits its own rigorous study and consideration in the literature.

Overview of the Existing Literature on the IB DP and its Effects

The research that exists on the IB DP and its effects includes benefits of the program, as well as some drawbacks. This section will outline some of those effects. This should provide a brief sense of what is to come through the completion of this systematic literature review.

One of the studied benefits of the program includes college (or university) persistence (e.g., Bergeron, 2015; Coca et al., 2011; Gordon, VanderKamp, & Halic, 2015). It would seem

that students who have taken the IB DP in high school are more likely than their peers to persist (and not drop out) in college, for at least the first two years. Students who have taken the IB DP are also more likely, according to one study, to enroll in more *selective* (or desirable) colleges (Coca et al., 2011). When it comes to college preparation, in the same study by Coca et al. (2011), IB DP students claim that they feel better prepared for college as well.

In the IB DP, students tend to experience greater academic achievement as compared to their non-IB peers (e.g., Poelzer & Feldhusen, 1996; Shaunessy, Suldo, Hardesty, & Shaffer, 2006). Furthermore, students perceive an increased challenge and therefore are more motivated to be better students, according to Culross & Tarver (2007). Being a better student might include things like an increased sense of pride in his/her work, better ability to cope with increased workload, or better ability to cope with more difficult content (Foust, Hertberg-Davis, & Callahan, 2009).

Maybe because of the increased work expected, the rigor of the program, as well as the often-smaller classes sizes, students in more than one study report on the quality and preparedness of their teachers as being advantages to the IB DP (e.g., Culross & Tarver, 2007; Foust et al., 2009). According to Foust, Hertberg-Davis, and Callahan (2009), students in the IB DP also report that they experience better atmospheres in their IB DP classes, a greater sense of belonging in these classes, and having special bonds with (and more in common with) their peers in these classes.

One of the names that is the most cited in this field is that of Carolyn M. Callahan. Callahan holds her Ph.D. in Educational Psychology, and is a professor at the Curry School of Education at the University of Virginia (Rector and Visitors of the University of Virginia, 2015). According to her bio, she has been the director of the National Research Centre on the Gifted and

Talented for 18 years. Because of her interest in the gifted and her work in education, Callahan's areas of research include the AP and the IB (among other things). Callahan and a group of other researchers were able to conduct one of the largest studies into the IB DP done in the United States. This study used a grounded theory approach, collected interview and observation data, was conducted in more than 20 high schools in a variety of states, and its results were published in multiple publications (e.g., Callahan, 2003; Foust, Hertberg-Davis, & Callahan, 2008; Foust et al., 2009; Hertberg-Davis, Callahan, & Kyburg, 2006; Hertberg-Davis & Callahan, 2008). In one publication (Hertberg-Davis, & Callahan, 2008), the findings suggest that there might be advantages of the IB DP for gifted students. According to the study, gifted students perceive a greater level of academic challenge in the IB DP, and that this is favorable because they desire a greater challenge.

According to Callahan (2003; with Hertberg-Davis, 2008), there are limits to what high achievement programs like the IB DP (and AP) can offer the gifted, however. Because of the rigidity of the program due to time constraints (because of so much content), there is a tendency towards rote teaching of concepts, and teaching to the tests. This does not allow for the creativity and flexibility that some gifted students seek in their programming.

And there are other drawbacks. Foust et al. (2009) report that students in the IB DP might feel judged by other students in their schools, might feel that the program is time consuming and demanding of all of their free time (leading in some cases to stress, fatigue, and decreased social lives), are likely to complain about program rigidity and intensity, and are likely to feel isolated from the core culture in their schools. Foust, Hertberg-Davis, and Callahan (2008) report that IB DP students do try to have strong academic as well as social lives, but that they often do this at the expense of their sleep.

One of the emerging areas of research on the IB DP is the critical questioning of the program's justice. Questions of access have been posed, and it has been fairly well established that minority and low-income students do not have the same level of access to high achievement programs, like the IB DP, as their peers do (e.g., Hertberg-Davis & Callahan, 2008; Perna et al., 2015).

Other potential drawbacks to the program include a possible false sense of preparedness for college (National Academy of Sciences, 2002), as well as an increased workload for both teachers and students (Culross & Tarver, 2007).

It is my hope that this paper will shed some light on these benefits and drawbacks, as well as other effects of the program not yet mentioned. Furthermore, given that some of the areas within this field are just emerging, I hope that this paper illuminates a need for further research.

Methodology

This section of this paper will outline the methods and approach to the research. This research project used both quantitative and qualitative methodologies to systematically review the literature concerning the IB DP and its effects. Both qualitative and quantitative methodologies were used because we can learn different things from each, and because the research questions of this paper are each better served by a different set of approaches. In presenting some quantitative data in the form of basic descriptive statistics (frequency of findings), the trends in the existing research should be made apparent. In presenting some qualitative results, key themes from this inquiry can be discussed in terms of how they might impact decisions surrounding program implementation.

Method: Use of a Systematic Review of the Literature

A systematic literature review, as a method, is an effective way to bring members of the intended audience information (Thomas & Harden, 2008). While not all systematic review approaches have been well-developed yet (unlike, say, the meta-analysis of quantitative data from randomized controlled trials which is fairly well understood), the "systematic review is an important technology for the evidence-informed policy and practice movement, which aims to bring research closer to decision-making" (Thomas & Harden, 2008, p.2). Because this method serves to integrate the findings of many existing works, it can be valuable in furthering the awareness about a topic, as well as highlighting what has been done, and what needs to be done within a field of study. Therefore, using this approach should best serve to answer the two research questions of this paper. Since my research questions ask about the effects of the IB DP that have been represented and discussed in the literature so far, and also about what we can learn about the IB DP by looking at those effects, it would stand to reason that the research method chosen would need to systematically survey the current literature on the IB DP. Given that this is inherent in a systematic literature review, this was the logical methodological choice.

Research Approach

This section of this paper will outline the specific steps that were taken to conduct the research. First, appropriate sources were located and selected using a variety of search approaches, and based on a number of inclusion criteria. Then, each selected source was briefly annotated and assigned a type (e.g., peer-reviewed journal article, report, etc…). The findings of those sources were coded for the effects of the IB DP that they presented. Finally, the frequency of each code was determined, and those codes were categorized into themes.

Selection of sources. The search was carried out using a variety of search tools (discussed in a moment). Search terms included International Baccalaureate, IB, effects of, high achievement programs, streaming, and ability grouping. The results generated by each tool were skimmed to look for papers that touched on the IB DP. If a paper did mention the IB DP, then the abstract or executive summary was read to see if it might go into any possible effect of the program. If it did, the paper was saved in a database, printed, or downloaded and saved, for proper reading, annotating, and coding.

Search strategies also included chaining from footnotes and reference sections of previously located sources. Chaining was also used from articles that were literature reviews. Because literature reviews do not contain primary data on IB DP effects, those papers were not themselves included in this study.

The search was conducted between October 2015 and December 2016. While some papers were identified for this study early on (in October and November 2015), the bulk of the research was conducted later on, mostly in April 2016, and then again in the fall of 2016. Earlier searches included using the additional terms Advanced Placement and AP, as I was originally interested in the effects of that high achievement program as well. Later searches relied only on the terms stated earlier, and papers that had originally been found that focused on AP, but not IB, were ultimately not included in this study. Sources that focused on both the AP and the IB could be included in the study, but only the explicitly mentioned effects of the IB DP were used for coding.

The following paragraph outlines the major search tools that were used in locating the papers included in this study. Because I am a student at the University of Alberta, it was their library page and database collection that facilitated the majority of my searching. This was done

using the education database collection, as well as advanced search functioning. Google was also used when chaining led to a paper that could not be located via a University of Alberta libraries search. The first 20 papers came from employing this combination of University of Alberta and Google search tools (see Appendix A for the list of included papers). In fairness to the International Baccalaureate Organization (IBO), their annotated bibliography (provided on their website) was also considered as a database for this search. Many reports, and some articles, that had not been previously identified for inclusion in this study came from this source (a total of 15 further sources). When no new papers pointing to an effect of the IB DP could be found using any of the mentioned search tools, that search tool was considered exhausted. A total of 35 papers were identified for inclusion in this study.

Sources were included in this study if they were published prior to 2016 (the year of this study), contained data collected in Canada or the United States, and included mention of at least one effect of the IB DP on schools (as a primary finding). This included effects on current, former, or prospective students, parents, teachers, administrators, or other stakeholders. The effects could be positive or negative in nature, and were considered effects no matter the affected sample size (i.e., sample size $n \geq 1$). Where more than one paper was published on a single study, all of the sources could be included, but only if each presented a new effect of the program, as any one study was not coded for the same effect more than once.

Sources were not included if they were about the IB program, but did not include any effects of the program. Studies conducted in places other than Canada, or the United States, were not included. Only published reports, dissertations, and articles were included. Conference proceedings and other types of publications were not included (unless they had a corresponding

report or article, in which case those publications were included, not the conference proceeding themselves).

Annotation of sources. Each source was preliminarily read and briefly annotated so as to give a general sense of its content (see Appendix A). These annotations were intended to support the qualitative descriptions of the major themes emerging from the sources, once the coding process established those themes.

Sources were also assigned a type. This was intended to present a transparency to the reader about the kinds of sources that were included in the study (see assigned types in the annotations in Appendix A). More than just peer-reviewed journal articles were included in this study, as there currently exists only a limited body of literature on the effects of the IB program.

Coding. Coding was done in an open fashion. Papers were read, and as any effect of the IB program was mentioned, that bit of text was saved. The effect described by the text was determined and saved as well. Then, a code was assigned to the determined effect. The codes ended up representing different types of effects of the IB DP. The codes were also categorized so that they could ultimately be discussed as themes. Table 1 shows a sample of the coding process. A description of each code chosen for use in this study is outlined in the results section of this paper. The complete coding process work is also available (see Appendix B).

Table 1

Sample of coding process work

Author	Text	Effect of the program	Code	Category
Mayer, 2008	"We feel that one thing which the IB program provides, which is very seldom accomplished in public schools, is a sense of community." (from interview data, p. 228)	perceived sense of community	improved school climate	School Climate
	"In 2006, 48 of the 55 diploma candidates went on to college. Findings from this study suggest a wide range of students can succeed in a rigorous academic program like IB." (pp. 229-31)	increased success for minority students	improved access	Access

When an effect was reported multiple times within a paper, it was only saved once for coding. The first, or most representative, mention of that effect was often used (see Appendix B). In some cases, more than one sample of text was saved to provide evidence of an effect being present multiple times in the findings of a paper, even though the corresponding effect was still only represented one time in the coding process.

When more than one published work came from a single research *study*, any cited effect of the IB DP from that study was only saved once for coding. For example, if one study was done but two papers were written about it, and lack of sleep was cited as an effect of the program in both papers, then lack of sleep was only listed as an effect for one of the papers, for the purposes of the coding process.

Frequency analysis. Once the codes were applied to the identified effects, their frequencies could be determined by counting the occurrence of each one. These frequencies are a representation of the extent to which each type of effect of the IB DP appears in the literature. In other words, they represent the number of times each type of effect has been chosen for study, or exposed through study. These frequencies were tabulated and charted, so that they could be discussed (see tables in the results section).

Thematic analysis. After examining the frequency data, major themes from the literature were established for the sake of discussion. The thematic analysis in the discussion of this paper will be focused on presenting each category of coded effects, in terms of what they mean for the research on IB and for schools in their implementation of the IB DP.

Results

Types of Sources

After utilizing the search strategies outlined previously, 35 published papers were located that fit the inclusion criteria of this study. The 35 papers were classified based on type. Four different types of papers emerged: peer-reviewed journal articles, reports, reports prepared for the IBO, and doctoral dissertations. A paper was classified as a peer-reviewed journal article if it was published in a juried academic journal. A paper was classified as a report if it represented a study published independently from academic journals. Special interest groups, consortiums, government branches, or private research companies often authored these types of studies. Many of the reports were clearly commissioned for publication by the IBO. These include papers whose authors work for IBO, or papers from independent research companies hired by the IBO.

In these cases, the reports were identified as reports prepared for the IBO. A paper was considered a doctoral dissertation if it was classified as such, or as an academic thesis.

Most of the journal articles were located using the University of Alberta library education databases in conjunction with chaining and Google. Sixteen of the 18 peer-reviewed journal articles were located using these strategies. These strategies also yielded two reports and two doctoral dissertations. Use of the IBO website as a search tool resulted in the addition of one more report, two more peer-reviewed journal articles, six more doctoral dissertations, and eight reports prepared for the IBO.

Table 2 shows the breakdown of the types of paper located for the purposes of this study. While the most frequently located type of paper turned out to be the peer-reviewed journal article, these articles represent only slightly more than half of the included studies. Fifty-one percent of the papers in this study are peer-reviewed and journal published. Twenty-three percent of the papers in this study are reports that were commissioned directly by the IBO. Seventeen percent of the papers are doctoral dissertations. Nine percent of the papers are other reports. This breakdown of the types of papers that are included in this study will be further evaluated in the discussion of this paper.

Table 2

Frequency and Proportion of Included Papers by Type

Paper Type	Frequency of Paper Type	Proportion of Paper Type*
Peer-Reviewed Journal Articles	18	0.51
Reports Prepared for the IBO	8	0.23
Doctoral Dissertations	6	0.17
Reports	3	0.09

* For n = 35 total papers

Frequency of Effects

Reading all of the included papers resulted in 149 effects being identified. Those effects were coded using 10 different codes, which emerged as a result of the open coding process. Those codes and a description of each can be found in Table 3. The codes were established once the effects had been identified in an effort to group the effects together by type.

Five categories of codes emerged as a result of the coding process: effects relating to school climate, effects relating to academic outcomes, effects relating to non-academic outcomes, effects relating to college, and effects relating to issues of access. Table 4 shows the frequency and proportion of the types of effects identified in each category in this study. These findings represent the extent to which each type of effect has shown up in the literature on the IB DP. For example, the code 'improved school climate' was applied to 18 of the 149 identified effects in this study. This represents an overall proportion of 0.12. Therefore, 12% of the identified effects related to positive impacts of the IB DP on the overall school climate and community. In fact, the category of school climate was ultimately the most represented in the literature. This was followed by the academic category, after which the non-academic and college categories (which were equivalent to one another) appeared. Finally, it can be seen in Table 4 that issues of access have been the least well represented in the literature on the IB DP.

Table 3

Descriptions of the Codes Used For All Identified Effects

Code	Description
Improved School Climate	This code was applied to any effect that created a positive impact on the school community and environment. These effects often impacted more than just IB students. Included were effects on teachers, other students, enrolment, etc…
Challenge to School Climate	This code was applied to any effect that might have a negative impact on the school community and environment. These effects often impacted more than just IB students. Included were effects on teachers, other students, resources, etc…
Positive Academic Outcome	This code was applied to any positive impact the IB program had on DP students specifically, in terms of their academic work, experience, or success.
Negative Academic Outcome	This code was applied to any negative impact the IB program had on DP students specifically in terms of their academic work, experience, or success.
Positive Non-Academic Outcome	This code was applied to any positive impact the IB DP had on the students enrolled in the program in a non-academic sense. These positive impacts included improvements to general skills, lifestyle, health and wellness, etc…
Negative Non-Academic Outcome	This code was applied to any negative impacts the IB DP had on the students enrolled in the program in a non-academic sense. These negative impacts included things like increased stress, loss of sleep, loss of social life, etc…
Improved College Outcome	This code was applied to any effect of the IB DP on a student's college experience that improved the experience.
Negative College Outcome	This code was applied to any effect of the IB DP on a student's college experience that created a more challenging or negative experience.
Improved Access	This code was applied to any effect that suggested the IB DP was becoming more inclusive in nature, or was improving learning outcomes for often marginalized and at-risk groups in education.
Lack of Access	This code was applied to any effect that suggested the IB DP was exclusive in nature, or was underserving the often marginalized and at-risk groups in education.

Table 4

Frequency and Proportion of the Effects of the IB DP Coded for in the Included Papers

Effect Category	Frequency of the Effects in this Category	Proportion of the Effects in this Category*
School Climate	41	0.28
Improved School Climate	18	0.12
Challenge to School Climate	23	0.15
Academic	36	0.24
Positive Academic Outcome	25	0.17
Negative Academic Outcome	11	0.07
Non-Academic	31	0.21
Positive Non-Academic Outcome	15	0.10
Negative Non-Academic Outcome	16	0.11
College	31	0.21
Improved College Outcome	29	0.19
Negative College Outcome	2	0.01
Access	10	0.07
Improved Access	7	0.05
Lack of Access	3	0.02

*For n = 149 total identified effects

From Table 4, we can also see that some effect categories seem to carry more positive effects than negative effects, and others not. When it comes to academics, the program seems to result in more positive outcomes for students than negative ones, at least according to the included studies. Research also seems to suggest that college outcomes for students are largely positive in nature. However, when it comes to school climate, there appear to be more challenges mentioned in the literature on IB, than there are positive impacts. The non-academic effects of the IB DP on its students are split: there are approximately as many benefits represented here, as there are drawbacks. The issue of access seems to suggest that there have been more positive implications of access studied than negative ones, but the category itself is very light, and likely requires further research. These trends and their implications will be further explored in the discussion section of this paper.

Key Themes in the Literature

Five major themes emerged in the literature on the effects of the IB DP. The categories used to group the codes serve as the themes used for the purposes of discussion in this paper. Therefore, these themes include effects on school climate, academic effects, non-academic effects, effects on college outcomes, and effects on access. Table 5 outlines the effects that fell into each category after the coding process (a complete summary of the coding process can be found in Appendix B). Within each theme, there are apparent trends. For example, in looking at the theme of school climate, it can be seen that the effect 'feelings of isolation from core school culture' appeared in four of the included studies. Therefore, this is likely an important consideration for any school that chooses to implement the IB DP. These five themes and the trends relating to the effects within them will be explored in detail in the discussion section of this paper.

Table 5

Effects of the IB DP on Schools in Each Category/Theme

School Climate		**Academic**	
Improved School Climate	Challenge to School Climate	Positive Academic Outcome	Negative Academic Outcome
strong interpersonal relationships in the program (2) better relationships with teachers (3) higher perception of school climate creation of strong relationships with peers (2) perceived sense of community students become more involved in service activities higher perception of school climate improved school culture increased collaboration among teachers (2) increased enrolment in the school improved teaching in general education classes due to increased teacher training improved school reputation and enrolment improved academics/increased expectations for all students in the school	increased need for resources increased stress for teachers (2) rigidity and lack of flexibility of the program (4) feelings of isolation from core school culture (4) lack of guidance and support perceived judgment from other students in the school difficulty maintaining trained staff heavy financial cost to districts and schools difficulty with alignment to local curriculum lack of time for proper implementation creation of large general education classes teachers' time unevenly distributed between IB demands and regular class demands inequity amongst teaching assignments disparity of resources increased workload for teachers increased entitlement	feelings of strong academic identity increased academic performance (3) better quality work higher level thinking (4) better quality of teacher (4) increased challenge (3) increased perception of the quality of education development of lifelong skills increased performance on standardized tests (2) better quality education (3) improved learning environment increased performance in math	increased workload (5) faster pacing students with modest academic backgrounds find the program to be a struggle some students lack proper skills and motivation to be successful high perceived level of difficulty/struggle increased pressure leads to academic dishonesty increased level of difficulty

Non-Academic		**College**		**Access**	
Positive Non-Academic Outcome	Negative Non-Academic Outcome	Improved College Outcome	Negative College Outcome	Improved Access	Lack of Access
feelings of motivation and goal-orientation better self-management skills higher level of psychological well-being lower levels of emotional and social distress higher level of motivation development of thinking and learning skills IB cohort as a support group desire to disprove stereotypes and improve one's lifestyle decreased initiation to cigarette smoking decreased repetitive use of cigarette smoking increased feelings of motivation increased feelings of pride in their work increased high school graduation rates improved coping mechanisms homogeneous grouping of students created – desired by parents	sacrifice of social life (4) sacrifice of sleep (2) increased stress (6) sacrifice of healthy lifestyle increased feelings of academic superiority over peers increased stress even in years of pre-enrolment creation of parental pressure to access the program	increased college enrolment (3) increased choice of selective college increased college persistence (4) increased feelings of academic readiness for college (4) perceived increased college admission perceived increased college preparedness (3) perceived increased college admission by parents less perceived stress compared to colleagues in first year postsecondary studies savings of time and money with advanced credits higher perception of the program by universities increased college graduation (3) increased choice and enrolment in more selective colleges increased college performance increased feelings of academic readiness for college (due to the extended essay) (2) improved college acceptance/admissions process	students believe they must have IB courses to get into college false sense of readiness for college	increased success for minority students higher college graduation rates for low-income students increased access over time for low-income students (2) increased access over time for minority students decreased high school drop out rates (especially for black students) increased high school graduation rates (especially for black students)	low enrolment of diverse and low-income students lack of enrolment of diverse and low-income students students of particular races, or particular family backgrounds, are more likely than their peers to enroll in IBDP

Note: a number in brackets indicates the number of times that same effect repeats itself within its category

Discussion

Types of Sources

Four types of sources were included in this paper: peer-reviewed journal articles, doctoral dissertations, reports, and reports prepared specifically for the IBO. In order to make evidence-based decisions in education, practitioners would likely rely primarily on journal published materials. Therefore, it might be concerning that only 51% of the papers containing effects of the IB DP take the form of peer-reviewed journal articles. It might also be concerning that 23% of the papers included in this study take the form of reports specifically commissioned by the IBO. While the IBO is likely aiming to provide schools with the best decision-making information possible by commissioning these reports, it would stand to reason that they would probably like the DP to appear in a positive light. Therefore, they might generally commission investigations into areas that typically shine a favorable light on IB. Many of the reports prepared for the IBO investigate college trends (see, for e.g., Bergeron, 2015; Halic, 2013; Shah, Dean, & Chen, 2010). Fourteen of the 29 times the code 'improved college outcome' was applied to an effect, the effect had come from a report prepared for the IBO. Virtually half of the data out there suggesting that the IB has positive college outcomes for students is published in reports that the IBO itself commissioned. While all of this data is still very useful for informing practice, and while the IB DP likely *does* have an overall positive impact on college outcomes for students (discussed further later on), it would be ideal if more research could be done on these outcomes from sources outside the IBO itself.

It should also be noted that many of the sources illuminating the negative academic and non-academic effects of the IB DP are qualitative in nature, and often contain results stemming from as little as one individual's response. While these responses are still valid, and important, it

would be useful to practitioners if the field of research on the potential negative academic and non-academic impacts of the IB DP were expanded, especially in ways that might offer increased generalizability of results. For example, if we consider the negative non-academic impacts of the IB DP uncovered in this paper, 25% of them come from the grounded theory Callahan study (Foust et al., 2008; Foust et al., 2009; Hertberg-Davis & Callahan, 2008). This large-scale study (mentioned earlier in this paper) produced multiple publications, and is undoubtedly one of the more important works present in the literature for exposing some of the drawbacks of the IB DP. These publications are cited in many of the literature review sections of other papers in this field. However, the data in the study comes largely from interviews, and therefore some of the results could be based on a data set as small as n = 1. While unquestionably valuable, this work would benefit from others replicating its efforts while adding further layers of scrutiny, such as with quantitative analysis. Some papers that consider the non-academic impacts of the IB DP do include quantitative approaches (Shaunessy et al., 2006; Suldo & Shaunessy-Dedrick, 2013; Suldo, Shaunessy, & Hardesty, 2008; Taylor & Porath, 2006), but these are few in number.

The fact that six (or 17%) of the identified papers are doctoral dissertations is promising. This might suggest that emerging academic scholars are interested in the IB DP and what it does for schools and their populations. A continued inquiry into the effects of the IB DP will only improve the decision-making ability of those working in education, and further their ability to take an informed approach program implementation.

Frequency of Effects

The purpose of the frequency study in this paper was primarily to address the research question: to what extent have the effects of the IB DP in Canada and the United States been

represented and discussed in the literature so far? This section of this paper will discuss the key findings that pertain to this research question.

It should be noted, prior to discussing some answers to that question, that while the high frequencies of some types of effects suggest that those effects are important to consider, it does not mean that those are the *most* significant effects of the IB program, but rather the most studied or apparent in the research so far. Given that this paper indicates the frequencies with which certain types of effects present themselves in the literature, we can only use these frequencies to understand how well-researched those types of effects are, rather than how *important* those types are effects probably are. Of course, it could be said, for example, that because the grounded theory papers allowed the students to vocalize their own experiences without any preconceived idea about where the answers might end up, that those students reported on the effects of the IB DP that were at least the most important to *them*. In other words, the effects in this paper carry what could be described as at least a relative importance. Furthermore, it should be understood that this paper does not include non-effects of the IB DP, which might also be important for schools and their various stakeholders to consider. And, there are likely effects of the IB DP that have not yet been uncovered explicitly by researchers but that will appear in time with more work dedicated to this field. New effects will be important to consider moving forward.

Having said all of this, the frequency data in this paper can help us to understand some possible trends surrounding the IB DP.

Fifteen of the papers included in this study reported on a positive college outcome for students of the IB DP. This was the most frequently assigned code in this project. Nineteen percent of all of the codes assigned were for positive college outcomes. This makes these effects possibly the best studied for the IB DP. It is likely this is the outcome of the program that we

know the most about. For schools promoting the IB DP to their students this is probably reassuring as, at least in my experience, this is one of the selling points of an IB education: the fact that we see better results for IB students at the college level. Negative college outcomes only represented 1% of the effects located in this paper. This suggests that we either have not uncovered what these might be yet, or, that there really are not very many negative impacts of experiencing the IB DP on a student's college education. Even if some of the papers on college outcomes have the IBO bias, it is unlikely that the IB DP *hurts* most students' college experiences, based on these frequencies. Schools can probably feel good about suggesting that the IB DP has an overall positive impact on college outcomes for students.

The most frequently assigned codes fell into the category of school climate, with more than half of those codes representing effects that were challenges, as opposed to improvements. School climate codes were applied to effects that had to do with overall school environments and communities (in other words, the experiences IB students and others might have in school), so it is clear that these issues are of significance at least to the respondents/participants in the included studies. This was the only category where the effects of the program seemed to do more harm than good based on the research so far. Schools that offer the IB DP should probably take a closer look at the ways their programs are impacting their school climate and community, based on this evidence.

Seventeen percent of the codes in this paper were assigned to positive academic outcomes. This was the second highest proportion of effects, after the improved college outcomes. Only 7% of the effects suggested negative academic outcomes. This suggests that the program probably does carry some benefits to the academics of its students, at least enough to warrant consideration by those who do, or who wish to, implement the program.

With 21% of the effects in the literature falling into the non-academic outcomes category, this category is definitely an important one to consider. Twenty-one percent is the same as the college category, so schools and students should probably take these effects as seriously as the effects of the program on college and on academics. In my experience, however, this is not the case. Students interested in the IB DP seem aware of the fact that the IB DP is intended to help them obtain a better quality education and improve their academics. They seem aware of the fact that the IB DP might improve their college outcomes. However, they often do not seem to consider the fact that the program might require them to engage in their schooling in a more psychologically taxing way, as compared to regular programming. They do not always seem aware of all of the possible costs to their health and well-being that might come as a result of those academic and college-type gains. The non-academic benefits of the IB DP were approximately as frequent as the drawbacks. But again, students do not seem to understand that they might gain more than just academic and college-type benefits from the IB DP, such as the development of increased motivation and feelings of pride. To summarize, I feel that while this category seems to carry a weighted importance in the literature, it is not often enough talked about in schools. The results of this study suggest that the possible non-academic impacts of the IB DP should be made explicit to students, and discussed more openly, along with other more obvious elements of the program.

The category with the least amount of coverage in the literature is the access category. There has not yet been a sufficient amount of inquiry into the effects of the IB DP on marginalized students in schools. This is likely because many such students have not historically accessed high achievement programs in the same numbers as their more privileged counterparts. However, when a school implements a program such as the IB DP, there are effects on all

stakeholders, including the marginalized in the school community. The numbers in this study suggest that the IB DP might ultimately be able to have a positive impact on issues of access and marginalization in schools (since the improved access code was used more frequently than the lack of access code), but likely we just need to see more work done in this area. In looking at the fact that only 2% of the effects in this paper were coded as lack of access, it might seem like lack of access is not a problem. But, it is more likely that it just has not been well enough studied yet. And, on the flip side, perhaps the IB DP can create access opportunities in more positive ways than what we currently understand, as well.

Key Themes in the Literature

This section of this paper will address the second research question: what can we learn about the IB DP in Canada and the United States by looking at the effects of the program that have been studied in the literature so far? Each theme will be explored in terms of the specific effects within them, and what those effects might mean for schools and their stakeholders.

School climate. The theme of school climate was the most frequently encountered category in the research, with the IB DP potentially having both positive and negative impacts on a school's community and environment.

In looking at the 'improved school climate' effects from Table 5, it would seem that the IB DP seems to have a positive impact on the feeling of community and the building of relationships within a school, at least for the IB students themselves. According to Coca et al. (2012), students enrolled in the IB DP "develop a strong belief in the necessity of having and relying upon an academic community during their high school years in the program." This need for, and development of, a strong sense of community is echoed in other papers as well. Vanderbrook (2006) states that gifted females who enroll in the IB DP have a tendency to feel

safe, and to appreciate the fact that they are now part of a shared experience with like-minded intellectual peers, often after having been singled out previously in regular programming. DiGiorgio (2010) claims, "from the point of view of many students, the IB program allowed students who normally felt ostracized or restricted in regular classrooms the freedom to share their knowledge and interest with peers of similar ability" (p. 284). In short, the IB DP seems to allow some students an increased opportunity to make friends. Furthermore, schools that are in need of developing a sense of community might benefit from implementing the IB DP, according to the work of one researcher. Interview data in Mayer (2008) stated, "one thing which the IB program provides, which is very seldom accomplished in public schools, is a sense of community" (p. 228).

In looking at the data presented in Table 5, it would seem that many of the IB DP benefits to school climate come down to the quality of the teachers, relationships with teachers, and teacher training. Shaunessy, Suldo, Hardesty, and Shaffer (2006) claim, "IB students reported more positive perceptions of student-teacher relations and student interpersonal relations than general education students" (p. 82). Poelzer and Feldhusen (1996) further suggest that IB DP teachers have a tendency to interact *more* with their IB DP students as compared to their regular stream students, and that they are perceived to be more specialized due to larger knowledge bases. Despite the fact that these benefits seem isolated to the IB crowd, some of the effects in Table 5 suggest that improvements to teacher quality permeate general education programs throughout a school as well. For example, in Verneuille (2011) it is suggested that because teachers are forced to collaborate with each other to satisfy the demands of the IB DP, professional learning communities are formed. Professional learning communities, depending on how they are implemented school to school, certainly have the potential to benefit teachers

beyond the IB DP. Duarte (2013) also suggests that when IB DP teachers are trained in an area for the purposes of IB, they will likely use any acquired knowledge and skills in their regular program classes as well. One interviewee in Duarte (2013) refers to the IB DP as having "'raised the bar campus-wide'" (p.81), in part because of improvements to teaching practices across the board, but also due to increased expectations for all students as a result of offering a more rigorous program on their campus. In Verneuille (2011), this is echoed by an interviewee who states, "'we are a school that takes learning seriously'" (p.31).

And these benefits to the learning community can impact schools in additional ways. In O'Connor (2011), one school was able to increase enrolment significantly simply by offering the IB DP. In fact, that school counteracted any costs of program implementation using the funding attached to the new students they were able to draw. As a result, staff who were running the risk of losing their jobs were able to be kept, and the overall school culture improved. Duarte (2013) describes this phenomenon as being an increase to a school's reputation and general perception in the community, both which were accredited in the case of the school in the study to the presence of the IB DP.

There are also potential drawbacks to the climate in a school. In Table 5, the effects coded as 'challenge[s] to school climate' include such things as added stress and workload for teachers, increased need for (and disparity of) resources, inflexible timetabling for IB DP students, feelings of isolation for IB DP students, and staffing challenges.

The stressors for teachers seem to be quite significant. Beckwitt, Van Kamp, and Carter (2015) note that the challenge most iterated by IB DP teachers is that of time. Because of the added demands of the program, teachers simply felt that they did not have enough time to accomplish what was being asked of them. Culross and Tarver (2007) state that teachers notice a

large amount of material from outside their local curricula needs to be taught. This resulted, according to their study, in added stress for even the most experienced of teachers. One interviewee in Verneuille (2011) describes this stress by saying:

> Think about it. We have a bunch of teachers. They are all seasoned. They are teaching brand new courses for the first time. They are in the spotlight and everybody is watching them. Whatever grades they give are going to be published all through the district. (p. 38)

And schools notice the impact of offering the program on resources and staffing as well. One issue with staffing is the fact that not all teachers on a staff become IB teachers. Therefore, some teachers on a staff do not receive the same level of training and possibly level of respect within the school as their colleagues. Additionally, IB training usually requires travel, which is generally viewed as a perk. Teachers who do not get to go on a training trip might feel like they are not receiving fair treatment in their school. In O'Connor (2011), the competition between teachers for IB positions is described as being "not always collegial" (p. 107). There is, according to the same study, an "appearance of inequity [that is] substantiated and sustained by trends in teacher placements and promotion" (p. 107). Another issue with staffing is that there is often a level of difficulty in finding trained or qualified staff (Beckwitt, Van Kamp, & Carter, 2015). Beckwitt et al. (2015) note, "many of the teachers had not had sufficient training to teach in the IB program" (p. 69). They also claim that training quickly becomes out of date, and that not everyone in their study progressed beyond a level one training (Beckwitt et al., 2015).

This inability of schools to keep teachers trained at a current, or more advanced level, is probably one side effect of the often-prohibitive cost that the IB DP runs to schools. Beckwitt et al. (2015) describe the cost as being a challenge in multiple ways. First, the costs to the school (resources, training, exam fees, registration fees) are quite real. And, many schools choose to

extend these costs to the students themselves in the form of additional fees. Second, the issue of cost is a challenge because the public has a perception about the program and its financial burden on schools. This can create challenges within the community.

Because of the large cost of the program, there is often a disparity of resources created by the IB DP within a school. O'Connor (2011) talks about the fact that, because IB DP classes often run small, general education classes become larger to compensate. Further to that, O'Connor (2011) points out that a teacher might give more time and attention to their IB students and classes than their general education classes simply because of the demands. One interviewee in Duarte (2013) points out that the disparity in resources is felt throughout the school: "'there are some people here who are, like, oh, they are IB, you know everything goes to IB, or we aren't IB and so we don't get that'" (p. 90).

IB students notice that there are often costs to being a part of the program in terms of their school experience. In Duarte (2013) the data from one interviewee suggests that, "IB students are isolated on campus and do not interact with other students" (p. 97). And other studies suggest something very similar. DiGiorgio (2010) claims that IB limited the social circles that the students engaged in, and Beckwitt et al. (2015) suggest that the limiting of those social circles creates a separation between the IB students and the other students. And other effects arose from that sense of isolation, such as the propagation of unflattering stereotypes about IB students by other students in their schools (Foust et al., 2009). One of the reasons cited for the creation of the sense of isolation felt by IB DP students is the structure of the program (Foust et al., 2008). Students in the IB DP must take specific courses, and often, due to small program numbers, there is only one timetabling option that satisfies the requirements. This can create tension between programs, and student wishes for their high school experiences. In DiGiorgio

(2010) it is stated that one band teacher has the practice of discouraging students from the IB DP so that they can take band; if they choose IB, there is no room for the band program in the restrictive schedule. In Jarva (2013), one interviewed subject states that IB students are limited by what is classified as 'IB' within the school. If art, choir, or some other elective does not fall within the IB umbrella, then IB students cannot choose to take those courses.

The division between the IB students and the non-IB students within a school might have other secondary effects, apart from the obvious social and timetabling restrictions. In Duarte (2013), it is suggested by one subject that the IB students in his/her school develop the notion that they are somehow superior to the rest of their student body. This is a troubling phenomenon when issues of hegemony in education seem to be at the forefront of conversation.

Finally, Vanderbrook (2006) suggests that in the case of the two schools from their study, counselors had only minimal interaction with IB DP students, despite the clearly increased demands of the program. The emotional and career needs of the students in this study were not met. This is important, as schools wishing to implement the IB DP should probably take a more thought-out approach to the level of support that they offer the IB students.

Academic. The category on academic effects seems to be predominantly positive. However, some potential drawbacks are still worth considering.

When it comes to what a student stands to gain academically in the IB DP, there seem to be clear advantages, at least if you are the right kind of student. The data in Table 5 suggests that the IB DP can create a positive academic identity for students, can improve student achievement and work quality, provides students with a better quality of teacher, increases the level of challenge for otherwise bored students, increases the number of academic skills taught to students, and improves the learning environment.

Coca et al. (2012) found that students who had belonged in the IB DP in high school had a great deal of confidence in their academic abilities. They felt "that they *belonged* in college, that they were as smart as (and, in some cases smarter than) their college peers" (p. 45, emphasis in original).

This confidence might stem from an actual improvement in achievement and ability for IB DP students, as compared to what they would have accomplished in regular programming. According to Shaunessy et al. (2006), IB students received higher school grades and had an increased level of confidence as compared to their general education peers. Some might challenge that the increase in performance is only due to the type of student who chooses IB, but maybe not. The work expected of IB students is often of a higher standard (Poelzer & Feldhusen, 1996), which might contribute to an increase in ability. Poelzer and Feldhusen (1996) also report that students are tasked with higher-level thinking exercises, more complex tasks, and more group work in IB. In a study using matched pair testing, where the IB students were paired with the highest achieving non-IB students, the IB students scored significantly higher than their counterparts on standardized tests (Meister, 2011). Saavedra (2011) also used matched pair testing and determined that IB enrolment could be used as a predictor for standardized test performance, with IB students out-performing their counterparts. Additionally, Cortes, Moussa, and Weinstein (2013) determined that students in the IB DP had a greater likelihood of achieving a higher average when they compared matched groups of students from a school that did adopt the IB DP to students in a school that did not. Their results were especially pronounced in the area of mathematics.

Another reason that IB students might see improved performance is the quality of their teachers. Cavazos & Cavazos (2010) note that one student in their study reported having the best

teachers she had ever encountered in IB, and that they had very high expectations of her. From the teachers' points of view, some state that the IB "program has challenged them to become better teachers" (Culross & Tarver, 2007). Hertberg-Davis and Callahan (2008) suggest that students respond passionately about the excellent quality of their teachers; they view them as being masters in the fields that they teach.

Another academic advantage that the IB DP seems to be able to offer to students is that of an increased challenge, complete with higher level thinking, for students who might otherwise find themselves bored in regular programming. The subjects in the Culross and Tarver (2007) study describe the program as being "quite challenging but not overwhelming" (p. 57), suggesting that at least some students perceive the program to have a reasonable level of added difficulty. In Hertberg-Davis and Callahan (2008), the IB DP is described as an escape from less challenging courses: clearly a desirable one for those who stated as much. Subjects surveyed in a study done by Taylor and Porath (2006) claim that the IB DP "provided them with an intellectually stimulating curriculum" and that they "enjoyed the broader range and deeper understanding of the topics" (p. 153). It would seem that, for students seeking an enriched educational experience, the IB DP might be a good option for helping them find the added challenge and higher-level thinking that they are looking for. The higher level of thinking might come from IB's emphasis on teaching certain skills, along with knowledge content.

Culross and Tarver (2007) claim, "[teachers] perceive IB as focusing more on global issues, requiring higher level thinking skills, applying learning, developing links between concepts, and covering a broader spectrum of topics" (p. 58). In Taylor and Porath (2006), many respondents claimed that they had developed a wide range of skills as a part of their IB education. These skills included things such as time management skills, work ethic skills, and

communication skills. Part of the benefit of skills acquisition is the ability to use those skills (often more so than acquired knowledge) later in life. In one study, students reported learning better skills in the IB that could help them be successful in university, than they were taught in university itself (Jarva, 2013). One teacher in the Duarte (2013) study believed that students in IB were learning skills that were likely to be of use to them beyond their time in high school. These skills included research and writing skills. With the current push in schools to become more reliant on competencies rather than content knowledge, as well as to create so-called lifelong learners, these benefits might be of interest to districts and schools.

The learning environment might also improve in the IB DP, as compared to in general education. Beckwitt et al. (2015) suggest that IB seems to provide some consistency in education because of its programming. They suggest that this is in part because of the use of common practices. Some of the topics already discussed in the school climate section, such as increased teacher collaboration and training, probably add to this sense of overall improvement to learning as well.

However, increasing the level of difficulty in education comes with costs. The data in Table 5 suggests that the IB DP poses academic challenges to students, including an increase to their workload, the increased possibility of struggling (due to the greater level of difficulty), faster pacing, and increased pressure.

The fact that the IB DP comes with an increased academic workload seems fairly well established in the literature (Culross & Tarver, 2007; Hertberg-Davis & Callahan, 2008; Jarva, 2013; Poelzer & Feldhusen, 1996; Vanderbrook, 2006). In Vanderbook (2006), the girls who were interviewed reported that they had always had an easy time in school, up until they joined the IB DP. Once they joined, they often had a difficult time adjusting to the increased workload,

as well as the increased level of difficulty. The increased level of difficulty, according to Verneuille (2011) can make learning "strenuous" (p. 36) for students. In Hertberg-Davis and Callahan (2008), the added difficulty of the program is suggested to be too much for students who have not been previously taught time management, and other learning skills, even if they are intellectually inclined. Vanderbrook (2006) shares an example of a student who claims that her previous schooling did not set her up well enough to be successful in IB. There was a science concept that the student just could not understand because she felt that she was lacking in background information. And, due to the pace of the course, the teacher moved on, and she never did understand the concept. Culross and Tarver (2007) claim that an achievement gap exists within IB. Students who come into the program with high previous achievement levels seem to adapt well to the added difficulty. However, students with only modest previous achievement levels seem to struggle more. These findings are suggestive of the fact that schools should take care in who they are recommending to IB. Students who are unable to cope with an increased workload and level of difficulty should perhaps not be recommended to the program.

Further adding to the level of difficulty is the pacing in IB. Poelzer and Feldhusen (1996) suggest that teachers of the IB DP must deal with more complex concepts at an even faster pace. So IB students are dealing with a higher level of complexity in an even shorter time.

All of these factors that increase the difficulty of schooling for students can lead to added stress and pressure. This will be discussed in detail in the next section of this paper (non-academic impacts). But it should be mentioned here that feelings of increased pressure in the program can lead to dishonest academic practices (like cheating) according to one study (Taylor, Pogrebin, Dodge, & Tonso, 2002). In their study, Taylor, Pogrebin, Dodge, and Tonso (2002) discovered that IB students were becoming desensitized to certain cheating practices, viewing

them almost as requirements for survival in the program. Furthermore, because of the heavy workload, the students in their study seemed to have established a certain hierarchy for their cheating practices. They viewed copying homework, say, as acceptable because there was never enough time to get it all done, but viewed cheating on exams as being more serious, and something that most of them would not do, or would not do as often.

Schools should bear in mind that the academic benefits and the academic drawbacks of the program might impact different students differently. Gifted and advanced students might reap more benefits here than average students, and average students (or those unwilling to work hard) might be more susceptible to academic struggling. Care should be taken in recommending the IB DP to students based on its academic merits.

Non-Academic. The data from Table 5 suggests that there are many potential positive effects of the IB DP on a student's non-academic life, but also that there are many potential negative effects. This section should be paid careful attention to, as many of these effects describe how the IB DP might impact a student's health and well-being.

The 'positive non-academic' effects from Table 5 include such things as increased development of certain non-academic skills, the development of positive feelings towards school, benefits to health and well-being, as well as the creation of desirable student groupings.

Shaunessy et al. (2006) report that students involved in the IB DP feel "more confident in their abilities to manage their own learning behaviors, to master academic material, and to fulfill academic expectations than students in general education" (p. 82). The students in their study felt that they had developed better self-management, and metacognitive skills, than their peers. If this can be attributed to the IB DP, then this is an important positive for students to consider. These kinds of skills are valuable life-long, both in college and beyond. Poelzer and Feldhusen (1996)

also discovered that IB students seemed to have developed skills beyond what the students in regular programming developed. In their study, it was reported that the IB students had higher levels of independence, management skills, commitment, and responsibility for their own learning, as compared to the general education students.

Perhaps in part because IB students seem to have these skills, they also seem to develop more positive feelings towards their schooling. One of those feelings is that of motivation. Poelzer and Feldhusen (1996) report, "IB students, compared with regular students, show relatively high levels of motivation" (p. 7). In the study done by Foust et al. (2009), IB students reported feeling a motivation that was superior to that of their peers. Of course, it could be said that this is why some students choose IB programming in the first place: a superior motivation. But it would seem that the program at least cultivates those feelings. The same Foust et al. (2009) study found that the IB students also expressed feelings of increased pride in their work, stemming from the fact that they were able to do the more advanced work and keep up with the increased workload. The students claimed, "they derived pride from being able to rise to the challenges" (Foust et al., 2009, p. 10). Furthering the idea that the IB DP can give rise to positive feelings is data from a study that suggests that some students access the program in order to disprove racial stereotypes, change socioeconomic status, or to escape family patterns of dropping out (Hertberg-Davis & Callahan, 2008). The students in the study wanted to "escape a lifestyle that they did not wish for themselves" (p. 8). In such cases, the IB DP seems to come with, at least in the minds of these students, new opportunities and promises of college success that were otherwise unexpected for them. Saavedra (2011), who did a large-scale study on the impacts of the IB DP in over 100 Chicago schools (where the IB DP became implemented as an intervention to ensure success in education), found that the program could increase high school

graduation rates. Therefore, perhaps those students who look to the IB DP to give them hope of a better future are at least somewhat well founded in their beliefs.

The possible non-academic benefits to students include health and wellness effects as well. It would seem that IB students might have a higher level of satisfaction in life, indicating a greater level of psychological well-being than their non-IB peers (Shaunessy et al., 2006). The same study suggests that they have lower levels of social and emotional distress, based on having fewer externalizing behaviors of psychopathology (like aggression) and fewer negative relationships with peers. Suldo and Shaunessy-Dedrick (2013) claim that despite the increased stress of the IB DP, students in the program do not have the same propensity to develop emotional distress as their general education peers. In other words, even though they experience stress, they seem better equipped to cope with it and demonstrate positive emotional functioning. Perhaps some of the increased ability to cope comes from the strong relationships built within the IB program (as mentioned in the section on school climate). Poelzer and Feldhusen (1996) claim that their teacher respondents believe that "IB students support each other a lot in their endeavors" (p. 7) suggesting that IB students experience positive support networks within their schools.

One study suggests that there might even be healthy lifestyle benefits to belonging to the IB DP. According to Amuedo-Dorantes, Mach, and Clapp (2004), there is a connection between the presence of the IB DP in a school and cigarette smoking. Schools with the IB DP have fewer students who try, and who continue to, smoke. This might be attributable to the program, but could also have to do with the types of students who have a tendency to enroll in the IB DP, or attend IB schools. Further exploration into any possible health benefits that might be associated with enrolment in the IB DP would be helpful here.

Given that the students in the IB DP often wind up serving as support groups for each other (Poelzer & Feldhusen, 1996), it might make sense that some of the parents of IB students view the often homogeneous composition of the students in the program as a positive (DiGiorgio, 2010). These groupings were considered desirable to some parents in DiGiorgio's study because they "felt safe knowing that their children were interacting with other students whose parents had raised them in a similar manner" (p. 284). These parents want their kids around other academically motivated and hardworking kids. DiGiorgio claims that the parents who are 'in the know' about IB want their children to have access to the best; they want them to gain the same cultural capital that they likely have. Because of that, they want them in the program.

The potential negative effects of the IB DP on students include increased levels of stress and pressure, sacrifice of social life, and threats to health and wellness.

Despite the fact that some studies (see above) suggest that IB students might have the ability to better cope with stress than their peers, many studies place the amount of stress facing IB students in a more unfavorable light. And, there are a significant number of studies that suggest that IB students face increased levels of stress (DiGiorgio, 2010; Duarte, 2013; Foust et al., 2009; Jarva, 2013; Suldo et al., 2008; Taylor & Porath, 2006; Verneuille, 2011). Taylor and Porath (2006) report that IB DP students spend time worrying about whether or not they will be able to meet the demands of the program, or that they might not be accepted into the postsecondary institution that they prefer. Some students describe the stress that they experience as the pressure to constantly excel; failure and substandard work are not options (Foust et al., 2009). And that pressure comes from more than just intrinsic sources. Students might enroll in the IB DP to appease their parents in the first place, suggesting that parental pressures could be

dominating forces in the lives of these students (DiGiorgio, 2010). Or, it is the parents who are the most concerned about the increased levels of stress that they are observing in their children (Jarva, 2013). Furthermore, stress relating to the IB DP might even begin *prior to* enrolment in the program (Suldo & Shaunessy-Dedrick, 2013). This phenomenon can be seen in students as young as grade nine, as they contemplate their high school programming and attempt to achieve the appropriate marks to eventually join the IB DP. In Verneuille (2011), one interviewee described the IB DP as being strenuous, and stated that students would likely need support from their families as well as within the school in order to successfully deal with the added stress. This is likely true, and in my experience, schools are not ensuring these supports to the extent that they should.

Despite the fact that students seem to gain a close network of friends within the IB DP itself, they might experience a sense of loss when it comes to their social lives, according to the data in Table 5. Culross and Tarver (2007) claim that concerned parents have expressed that the program is so intensive that students end up with less time for family and extracurricular activities like sports. In the Hertberg-Davis and Callahan study (2008), one student in a focus group interview claimed that they had heard (before joining the program) that they would lose their social life: no time for phone calls, no time for TV shows. And once they had joined the program, they decided that those claims were true. In Taylor and Porath (2006), IB student respondents felt that they had less time for friends who were not also a part of IB. The social separation experienced by IB students might create other programs as well. In one study, some of the IB students involved expressed feelings of academic superiority over their peers (Foust et al. 2009). Perhaps the isolation of these students (both socially and within the school schedule, as was suggested in the school climate section of this paper) from many of their peers exacerbates

this phenomenon of *different than* and therefore in some way *better than*. If IB students spent more of their time with more diverse groupings of students (be it in school, or through sports, etc…) then perhaps some of these feelings could be avoided.

Depending on the student, and how they cope with the increased work and pressure, some might experience negative repercussions to their health and well-being. Some of the IB student respondents in Taylor and Porath (2006) reported that they "sacrificed a healthy lifestyle" to be a part of IB. There are two studies that explicitly point out that IB students generally sacrifice sleep, in order to keep up (Beckwitt et al., 2015; Foust et al., 2008). Foust et al. (2008) suggest that the students in their study reported that sleep was the thing they preferred to give up, if they were going to try to have it all (such as maintaining some form of social life, or finding time to relax, along with getting their school work done).

One non-academic item that did not seem to come up explicitly in the research, but that I have experienced first hand as a teacher in an IB school, is the level of competitiveness that can exist between students in the IB DP program. I have never seen students ask each other 'what did you get?' after handing something back, quite like I have with the IB kids. It is like they *need* to know that they earned one of the best marks, or at the very least, not the worst mark. In my experience, this constant need to keep up with or outdo each other seemed to worsen the stress felt by any struggling students. True, pressure can also be motivating, but in the IB it seems to create a results-driven culture that stresses kids out.

If we want to be more responsible in our care of the students we teach, we cannot ignore the possible non-academic drawbacks of the IB program. We must offer adequate supports to IB students in the form of proper entrance screening, and counseling throughout the program.

College. The category of effects containing the most positive outcomes for students is the college category. So far, very few negative impacts of the IB DP on college have been reported on in the literature.

The data in Table 5 suggests that college has improved outcomes for IB DP students because of increased enrolment, persistence, and graduation; an improved admissions process and increased choice in selective colleges; and increased performance and preparedness (also leading to less stress).

In one of the largest studies on the IB DP and its impacts on college (over 85 000 students from over 100 schools in the Chicago area), Coca et al. (2012) compared an IB cohort of students to a cohort of their high achieving peers. They found that the IB students had higher college enrolment and college persistence patterns than their peers. And, this is not the only study to look at college data using some form of quantitative analysis. Saavedra (2011) used a propensity-score selection model and regression analysis to evaluate the effects of the IB DP on college enrolment. Students in an IB group were compared to a group of non-IB counterparts, with corrections made for differences in backgrounds, abilities, etc., such that the two groups could be considered more or less equivalent, apart from IB enrolment. It was determined using the analysis that students in the IB group were significantly more likely to enroll in college. Shaw, Dean, and Chen (2010) also used comparison student groups to study college enrolment as a function of being a part of the IB DP. The IB students had statistically significant and "consistently higher graduation rates than comparison group students" (p. 5). Reports conducted by Bergeron (2015) and Halic (2013) for the IBO also conclude that the IB DP increases college enrolment, persistence, and graduation. However, their reports only compare IB students to national averages, and not to comparison student groups, or within matched pairs. The problem

with reports such as these is that the type of student who has a tendency (at least historically) to choose IB is usually academically inclined, comes from an ethnic majority, has more educated parents, is part of the upper socioeconomic status, etc., so it could be argued that *of course* they have a greater tendency to enroll in, persist in, and graduate from college. Therefore, more studies like the ones using proper quantitative analysis should be conducted.

IB DP students might experience an improved college admissions process as compared to their peers, according to the data in Table 5. Students seem to know about this benefit, and might choose to enroll in the IB DP for the sole purpose of improving their admissions process (Culross & Tarver, 2007). Fitzgerald (2015) found that "Canadian admissions officers are very positively disposed towards the IB DP, particularly when compared to Canadian provincial and US high school curricula" (p. 22). Duarte (2013) further supports this finding by stating that an interviewed IB coordinator claimed that post-secondary institutions give special consideration to those students who graduate from the IB DP. The coordinator claimed that the difference between an IB student and a non-IB student becomes most pronounced at college application time, given the IB student's clear advantage.

Along with improved admissions, the data in Table 5 suggests that IB students seem to access more selective colleges. In California, Shah et al. (2010) found that "the enrolment rates of IB students at UC campuses show that IB students tend to enroll at the most competitive schools within the system" and that even though "students in the comparison group possessed similar academic credentials to IB students, they tended to enroll at the more competitive schools in the UC system at slightly lower rates than IB students" (p. 4). The Chicago Schools study done by Coca et al. (2012) also found that the IB students in their study were accessing more selective colleges than their peers. It could be that selective colleges have a greater propensity to

accept IB students, or simply that IB students tend to apply to more selective colleges. To fully understand this dynamic, including what this means for IB and non-IB students in the long term, more work is needed. On a final note about the admissions process, IB students might gain an advantage in other ways, such as by receiving transfer credit. Taylor and Porath (2006) report that "sixty-two and a half percent of the respondents [in their study] were granted advanced credit for some of their first-year courses, and those who chose to apply those credits stated that this freed up time to pursue other interests" (p. 153). When advanced credits are applied, students can save both time and money. With college being as stressful and expensive as it is, this possible benefit might appeal to a large number of students. The time savings is particularly interesting, as students would be able to take fewer courses in their first year (since they would already have credit for some of them), freeing up more time to be academically invested in the remaining courses. This could potentially improve performance in those remaining courses, and decrease first-year stress. More investigative work into the concept of transfer credit, and what it does, is needed.

Some of the most pervading effects relating to college in the literature are those that suggest that the IB DP better prepares students. In Table 5, if we combine all of the listed effects relating to readiness for college, we get a total of nine effects. Based on all of the research included in this study, that makes this the single most reported on area of impact for the IB DP. The Chicago Schools study (Coca et al., 2012) states, "students felt that the IB program provided them with a strong foundation for college, both by building core academic skills (e.g., critical thinking, analytical writing) and by transmitting specific content knowledge (e.g., literary forms, world languages)" (pp. 31-32). Taylor and Porath (2006) found that a significant majority of the IB postgraduate students in their study found introductory college courses easier because of their

experience with IB. A lesser majority (but majority still) found that even advanced college courses were probably easier because of their experience with IB. In Verneuille (2011), multiple interviewees believed that IB graduates were more prepared to be able to graduate college in four years than their peers. This could be in part because IB students are used to an increased workload, and are better able to manage a full time course load because of it. In fact, one student in Jarva (2013) claimed that in college:

> 'the quality of work that was demanded of me was the same [as in the IB program] but instead of being at school from 7 to 3 and then going to sports 3 to 6 and then work from 6 to 10 and then doing my homework after that, I had a class for an hour and then had a whole day to just relax…' (p. 63).

So some students believe that a college schedule is even more manageable than their high school schedules.

The level of college preparedness that is reported in these studies might be more than just perceived. There is at least one quantitative study that supports the idea that IB students are better prepared for college than their peers by examining academic performance. Shah et al. (2010) used matched comparison group T-testing to establish that IB postgraduate college students had higher first year grade point averages than their peers, in a statistically significant way.

Part of what makes IB students more prepared for college (apart from the added course work and learning of additional skills), might be the experience of the extended essay (Aulls, Lemay, & Pelaez, 2013; Inkelas, Swan, Pretlow, & Jones, 2013). The fact that students must complete and independent research project, at a level that many other high school students are

not exposed to, supposedly helps students to become familiarized with increased academic demands and the research process.

It would seem that the increased college preparedness felt by IB graduates becomes a part of the IB reputation within a school. Culross and Tarver (2007) report that the IB students in their study (who were still in high school) knew of the increased preparedness of IB postgraduate college students, and that this preparedness was a part of their own motivation for choosing IB.

Increased college preparedness might have other advantages for students as well. In the Taylor and Porath (2006) study, a number of IB student respondents believed that they were less stressed in their first year college courses than their peers on account of having taken IB. And, Conley, McGaughy, Davis-Molin, Farkas, and Fakuda (2014) report that IB DP graduates in college are simply better prepared to cope with the pressures of end-of-term papers and exams. The students in their study reported that they were not intimidated by those end-of-term pressures in the same way that their peers were. Perhaps the decrease in stress might have to do with better coping mechanisms, and time management skills, stemming from prior experience and exposure.

There is really only a paucity of research suggesting that the IB DP might negatively impact a student's college experience. This could mean that the effects on college really are primarily positive, or, that a significant amount more work needs to be done in this area. In the study done by Taylor and Porath (2006), a small number of their IB respondents claimed to have felt a false sense of preparedness for college because of their IB experience. So, despite all of the supposed benefits of IB on the college experience, not all IB students will experience those benefits. Furthermore, some students might get a so-called reality check in college, as they learn that they are not as prepared as they *anticipated* being. On top of this, students in high school

(having been exposed to all of this IB college hype) begin to believe that they *must* take IB to be appropriately competitive in the college admissions process, and in order to be adequately prepared for college (Hertberg-Davis & Callahan, 2008). The result is that students might choose to take IB even if they are not good candidates for the program, based on the positive college outcomes alone. This could create real pressure for high school students and their families as they make their academic programming decisions for high school.

Access. Issues of access are the least represented in this paper. It would seem that the IB DP might be able to have a positive impact on issues of justice and equity in education, but that its history of being a program predominantly accessed by the well-off racial majorities has precluded its ability to be fully inclusive as of yet.

The IB DP might be able to improve outcomes in schools for minority students, that is, *if* they can, or choose to, access the program. Caspary, Woodworth, Keating, and Sands (2015) claim that because of the rapid growth of the IB DP over time, more and more students of low-income are accessing the program than ever before. The percentage of low-income students in the IB DP has increased over time (Caspary, Woodworth, Keating, & Sands, 2015). Also, the number of students taking IB exams is becoming more and more representative of multiple racial groups and income levels (Austin-King, Lee, Arbisi Little, & Nathan, 2012). So perhaps, in some places at least, more marginalized students are gaining access to the program. Once a part of the program, students of historically marginalized groups might see some unique benefits. Caspary et al. (2015) report that 6-year college graduation rates for low-income students who were a part of the IB DP are on par with national graduation averages, which are substantially higher than the averages typically seen for that demographic. Another study suggests that the IB DP can decrease high school drop out rates and increase high school graduation rates, particularly for

African American students (Cortes, Moussa, & Weinstein, 2013). And, Mayer (2008) suggests that a wide range of students can do well in the IB DP, if given the opportunity.

Despite what benefits the program might be able to offer marginalized students, it should be reiterated that students would first need access to the program. And despite the fact that some of the studies (mentioned above) suggest that overall access is improving, others suggest that this is not necessarily the case. Perna et al. (2015) suggest that even though the IB DP has increased in popularity, its low-income student enrolment has not increased to the same overall extent. More schools with low-income students seem to be offering the program, but the low-income students do not seem to be accessing the program in the same numbers as their peers in those schools. Chen, Wu, and Tasoff (2010) support these findings as well. Their study suggests that students of particular races (i.e., white and Asian populations), or particular family backgrounds (i.e., parents with higher levels of education) are those who are the most likely to access the IB DP. In the 2008 Hertberg-Davis and Callahan study, they point out the fact that their sample of IB DP students is relatively homogeneous due to low enrolment of diverse student populations. This is probably true in a lot of the literature on the IB DP, though it is not always overtly discussed.

The reality surrounding issues of access and the IB DP is that we probably need more information, and therefore more research done, before we understand whether or not the IB DP is worthwhile for marginalized student groups, and whether or not those groups are experiencing increased opportunities with the program over time.

Gaps in the Literature: Opportunities for Further Research

It would be useful to schools and their stakeholders if the research on the effects of the IB DP continued to grow, in general. However, there are two particular areas that really seem to warrant more work in light of the findings of this paper.

One, as previously mentioned, there seems to be a scarcity of papers with aims to explicitly measure non-academic impacts of the IB DP, using any large-scale quantitative means. Using quantitative approaches here might help to determine the non-academic impacts that have the most bearing on the most students. This has not really been done enough to date, as a large portion of the data in this area comes from interview data with small sample sizes.

Two, it would be helpful if the research in the area of access was further developed. There are very few papers that explicitly show any effects of the IB DP on access and on marginalized groups of students in schools. If we value equity and issues of justice in education, then this area of research is deserving of further development. There is perhaps an opportunity here for the critical theorists to add some work to the field of IB education.

Recommendations and Significance of the Findings

It is probably true that any student who experiences the IB DP in school will have a mixed experience with the program. There are enough positive and negative outcomes thus far studied to suggest that what any one student will experience will likely be complex. Furthermore, each school implements the IB DP in a slightly different way. Differences might stem from student demographics, staffing, financials, district support, amount of in school counseling available, etc. School climate effects were more negative than positive in the research to date. Non-academic effects were mixed. College effects were much more positive than negative, and the academic benefits of the program seem to be more positive than negative in nature.

Therefore, it could probably be said that the program provides the opportunity for improved outcomes *after* high school, but we should ask ourselves what the cost is to the high school experience itself? Is the amount of stress worth it? Is the loss of sleep worth it? And while issues of access seem to be improving, do we really know enough about the possible inequities created by the IB DP in schools?

Despite the fact that these questions still exist, schools will likely continue to offer the IB DP. This because of parent and student demand, and likely because of the societal importance placed on college outcomes. The rapid growth of the IB DP in Canada and the United States speaks for itself: this high achievement program is probably here to stay. So what can policy makers, school districts, and schools do to minimize the negative impacts of the program, and enhance the positive? How are these findings significant to schools?

For one, schools should consider the possible psychological implications of enrolling students in the IB DP prior to granting them access into the program. The situation of each student should be considered. Does the student have positive coping skills? A support network? The desire to reap the academic and post-secondary benefits of the program at the cost of sleep, social life, and with the probability of increased work and stress? Suldo, Shaunessy, and Hardesty (2008) discovered that IB students who had access to family communication and positive appraisal had lower levels of stress and higher levels of life satisfaction than their peers who had other (often negative) coping strategies. If IB schools used counseling services as a part of the entrance process for the IB DP, and assessed whether or not students would likely have the ability to cope with the increased work and demands of the program, we might see better psychological outcomes for students in IB schools.

Additionally, given the many challenges to school climate posed by IB (increased work and stress for teachers, disparity of resources, lack of time, isolation of the IB cohort from the school culture, etc.), schools should carefully consider whether or not they have the ability to properly support the IB DP prior to its implementation. What supports will individual teachers receive? How will their increase in demands be compensated for? How will it be ensured that the IB students do not feel completely removed from the school culture, and do not experience complete rigidity in their schedule? Furthermore, schools should consider whether or not they could offer the IB DP without compromising other programs. Do they have sufficient funds and resources to ensure that the IB DP does not detract from the schooling of the children not enrolled in the program? If schools and school districts cannot effectively answer these questions prior to program implementation, then perhaps the offering of the IB DP should be reconsidered, despite its probable benefits on academics and college outcomes.

Finally, these findings are significant because schools need to ask themselves some difficult questions about access. Not enough is known about the way the program impacts already-marginalized groups of students in schools. So a school wishing to implement the IB DP should carefully consider the possible effects for *all* of the students in their school, in their various situations. Will outcomes for marginalized students be improved? There are certainly studies that suggest that this is possible (e.g., Austin-King et al., 2012; Saavedra, 2011), but also at least one study that suggests that even with growth in the program, disparities between groups of students might simply persist (Perna et al., 2015).

If schools choose to take a more carefully thought-out approach to implementation, then it might be possible to maximize the positive effects of the program, while minimizing the drawbacks, for the most students possible, within the school community.

Limitations of this Study

While I believe that this work has been successful, it is not without its own set of challenges and limitations. In this section of this paper, I will outline some of the shortcomings of this paper.

A challenge in any systematic review of literature is ensuring that all of the relevant literature has been included. While I did my best to exhaust the search approaches that I did use, it is likely that there are other papers containing effects of the IB DP that I did not discover because they would have only been uncovered using other search approaches. Furthermore, inclusion was largely based on the abstract of a paper, and whether or not it suggested that the paper studied or uncovered an effect of the IB DP. It is possible that some papers do present effects of the IB DP, but that this information is missing in the abstracts of those papers. While reading and understanding every IB DP paper in its entirety would have improved my ability to decide what to include, and what not to include in this paper, this would have taken too much time, and was well beyond the scope of this project.

One of the greatest challenges I faced in assembling these papers stemmed from a concern that I often find myself faced with when reading literature on the IB DP. I find that while many articles suggest that the IB program might *do* things, we often cannot be certain that it is *because* of the IB program that these things are happening; in other words, correlation does not imply causation. Just because a student might experience something, and also be a part of the IB program, does not in every case suggest that what is being experienced is an effect of the program itself. In many studies on the IB, causality is difficult to underpin. Given the fact that many students who access the IB DP are academically strong (because of the nature of the program with its rigor and workload) it makes sense that we often observe higher tendencies of,

for example, achievement or persistence in university (e.g., Bergeron, 2015; Coca et al., 2011; Gordon et al., 2015). However, these same students may have achieved exemplary grades, etc., even had they chosen regular programming, given that they are academically inclined in the first place. Some studies about the effects of the IB DP try to correct for confounding variables (e.g., Meister, 2011; Saavedra, 2011), but many do not, and therefore this is one possible source of error or uncertainty in this literature review.

One possible limitation to this work is the fact that not all of the included papers are peer-reviewed articles. In fact, some were reports published for councils or consortiums that might have private interests that they are trying to promote. Furthermore, many of the papers were reports commissioned for the IBO by the IBO. While these still provide valuable insight into some of the effects of the program, it is not likely that the IB commissions reports on the less academic, or potentially more flawed, aspects of the program. Therefore, there might exist a skewed number of papers representing the positive impacts of the program in this study.

Another limitation is the fact that a great many of the papers (especially those that outline program shortcomings) are qualitative in nature (often using a grounded theory or a case study approach) and present results that could be based on a single respondent's reply. While there is still value in each and every bit of interview data, etc., it is worth noting that more research is needed to examine some of the issues brought forth in these studies to see if these effects might have a greater generalizability than would be currently accepted given the nature of these studies.

Identifying the effects of the IB DP in the findings of all of the included papers was difficult and time consuming. Sometimes deciding what effect of the IB DP any given bit of text represented was challenging. It would have been very helpful to have someone to collaborate with on this, as it would have increased the validity of the findings. Triangulation in the data

analysis would have helped to optimize the coding process used in this paper. Given the nature of this project, this was not a solution that was available to me.

When a study mentioned variances coming from *within* the program, those findings were not included in this paper. For example, there exist studies that suggest that student performance in IB DP subjects predicts first-year college performance in those same subjects (see, for e.g., Caspary & Bland, 2011). However, because this does not clearly outline any effect of the whole program, these studies were not included. Also, studies showing how the IB DP might improve specific curricular areas were too specific to be included as an effect of the program in general. I list these as limitations because this data is likely still valuable to a stakeholder considering the general worth of the IB DP, and might be considered by some an oversight in this work.

Lastly, this paper is limited in its inclusion of only the effects of the program. Some of the studies examined illuminated possible non-effects of the program (things that the program was found explicitly *not* to do). While these non-effects are likely interesting to stakeholders implementing the IB DP, they were beyond the scope of the research questions in this paper.

Conclusion

It is my hope that the presentation of these effects from across the literature on IB gives reason to more carefully consider the implementation of the IB DP in schools. This is not to say that we should not offer such a program, and likely this program will continue to grow as a result of its benefits, but that we should also consider the drawbacks of the program and how we will help support students in coping with these, prior to implementation, wherever possible. As the program continues to grow, so should the research in this area, so that schools continue to have

improved insight into what is really needed to successfully make decisions surrounding the IB DP.

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APPENDIX A

Annotations of Sources

Papers in this appendix are presented in the order in which they were annotated (the same order in which they were located and identified to be included in this study). Table 6 presents the list of included papers, in the order they will appear in this appendix, as well as in Appendix B.

Table 6

List of Annotated Papers

Paper Number	First Author	Year of Publication	Paper Number	First Author	Year of Publication
1	Coca	2012	**19**	Suldo	2013
2	Perna	2015	**20**	Suldo	2008
3	Shaunessy	2006	**21**	Bergeron	2015
4	Poelzer	1996	**22**	Beckwitt	2015
5	Culross	2007	**23**	Caspary	2015
6	Hertberg-Davis	2008	**24**	Digiorgio	2010
7	Foust	2008	**25**	Shah	2010
8	Chen	2010	**26**	Verneuille	2011
9	Vanderbrook	2006	**27**	O'connor	2011
10	Taylor	2002	**28**	Austin-King	2012
11	Cavazos	2010	**29**	Jarva	2013
12	Amuedo-Dorantes	2004	**30**	Aulls	2013
13	Taylor	2006	**31**	Inkelas	2013
14	Foust	2009	**32**	Halic	2015
15	Fitzgerald	2015	**33**	Cortes	2013
16	Mayer	2008	**34**	Conley	2014
17	Meister	2011	**35**	Duarte	2013
18	Saavedra	2011			

Paper 1: Coca, Johnson, Kelley-Kemple, Roderick, Moeller, Williams, and Moragne. 2012.

Type: Report

The purpose of this report was to examine the effect of offering the IB DP in Chicago neighborhoods on the post-secondary outcomes of IB students both quantitatively and qualitatively. They looked at the outcomes for students who graduated in 2003-2007. They quantitatively examine the issues of enrolment in college, selection of a more selective college, and persistence in college. This report was written pursuant to the Chicago Schools' opening of 13 new IB DPs after the year 1997. A total of 85, 663 graduates in 122 high schools were followed (60% female, 40% male, 48% African American, 34% Latino, 6% Asian/Pacific Islander, 12% while) for the quantitative analysis, and 25 students were selected for longitudinal qualitative analysis. The qualitative sample mirrored the larger demographics. For the quantitative study, a control group of non-IB students was generated using students who had scores suggesting that they had the propensity to be an IB student. For the qualitative piece, semi-structured in-depth interviews were used. Interview data was converted into thematic codes.

Quantitative:

Key findings include: the majority of IB students enroll in college (59% in four-year college and 13% in two-year college). More IB students enrolled in college than the non-IB control group students (49% in four-year college). In four-year college, 75% of IB students persisted for at least 2 years, as opposed to 64% of non-IB students persisting. IB was not found to impact GPA or SAT scores (students in IB and non-IB scored similarly). Also, more IB students enrolled in more selective colleges (based on Barron's college competitiveness ratings). It should be noted

that these positive effects were only notable for students who complete the IB program. Students who begin in the program but then switch out experience no negative effect from that decision (their results effectively match the control group numbers), but also experience no demonstrable benefit from their time in IB.

Qualitative:

Students experienced increased feelings of academic readiness for college based on their academic rigor, the expectations of the program (including the extra content and requirement to learn a language), their teachers, and the rigor of the program. Students reported feeling confident in their academic skills, their content knowledge, their analytical writing skills, and their academic behaviors (like motivation, work habits, time management, organization, help-seeking behaviors). Students also reported that they believed that their high school IB DP cohort was more like a family to them. They refer to their IB cohort classmates as a community of support. Students also report feeling a significant sense of belonging in college, and feel a great sense of academic identity.

Paper 2: Perna, May, Yee, Ransom, Rodriguez, Fester. 2015.

Type: Peer-reviewed journal article

The purpose of this study is to explore whether or not students who are from low-income families, or from racial/ethnic minorities have the same access to the IBDP as their peers do. They seek to answer four questions. One, to what extent is IBDP offered in schools that serve Black, Hispanic, and low-income students? Two, to what extent do Black, Hispanic, and low-income students enroll in the IBDP? Three, for the state of Florida, is the IBDP offered in public schools that serve very high numbers of Black, Hispanic, and low-income students? And finally,

are there supports in the schools across Florida that vary based on the demographics of the school, that would help students to make their academic decisions?

Data was collected from the Common Core of Data (CCD) from the American National Center for Education Statistics. Also, the International Baccalaureate Organization database was used. These databanks were used to address questions one and two. The data covered the years 1995 to 2008. Questions three and four were addressed using survey tools. The surveys were administered to IBDP coordinators in 69 Florida schools, serving over 7,000 students. Surveys contained fixed-response, and open-ended items.

Findings:

- Over time, more schools attended by low-income students were offering the IBDP (some Title I schools probably became IB during that time, and some IBDP schools probably became Title I during that time.
- Even though the amount of non-white students participating increased over time, it did not increase to the extent that IB enrolment increased, meaning that not as many non-white students are accessing the program.
- Schools vary greatly in their application to the IBDP procedures, as well as their policies for continued DP enrolment. In fact, the attitudes of various coordinators were dramatically different about who they believed that the IBDP was for. Some felt that it should be inclusive, and (fewer) held that it was for the academically inclined only.
- Title I schools were less likely to offer IBDP counselors as supports to their students.

Paper 3: Shaunessy, Suldo, Hardesty, Shaffer. 2006.

Type: Peer-reviewed journal article

This study aimed to evaluate the psychosocial functioning of students in the IB DP. The focus of the study was adolescent psychosocial functioning, which involves three major areas: academic functioning, emotional distress, and psychological well-being. The study also looked at life satisfaction as a measure of subjective well-being (i.e., happiness, and perceived quality of life). The climate of the school was also measured, according to the students' perceptions. Participants included 122 students enrolled in an IB DP (33 gifted and 89 high-achieving), and 179 general education peers. Data collection involved two instruments: the School Climate Scale, and the Self-Efficacy Questionnaire for Children. For the psychosocial functioning portion of the study, only the Self-Efficacy Questionnaire questions dealing with academic self-efficacy were considered.

Results:

- The students in the IB group reported higher levels of satisfaction with their student interrelationships, student-teacher relationships, sharing of school resources, and order and discipline than their regular education peers (overall higher level of school satisfaction).
- IB students achieved highers GPA's, had higher academic self-efficacy, had fewer discipline referrals, and had better attendance than their regular education peers (overall higher academic functioning).
- IB students had higher levels of satisfaction with their friends and their living environments than their regular education peers (overall higher levels of psychological well-being).

- IB students have lower levels of externalizing symptoms of psychopathology, and fewer negative peer affilitations (i.e., “bad kid” friends) than their regular education peers (overall lower levels of emotional and social distress).

Paper 4: Poelzer, Feldhusen. 1996.

Type: Peer-reviewed journal article

This study compared the achievement of IB students to non-IB students in biology, chemistry, and physics. HL subjects, SL subjects and regular subjects were examined. The study had 708 participants from seven schools. All of the schools were in Alberta. Pre- and post-test data were compared using ANOVA analysis. Qualitative interview data with 11 teachers was also collected. The purpose of the qualitative data was to ascertain how IB students were different from regular students, how IB student interaction impacted teaching, how teachers taught regular and IB students differently, and how schools selected IB students. The measuring tool was AP chemistry, biology, and physics tests that the students would not normally write, nor should they have previously seen. Students completed either the even or odd questions in the pre-test, and then the opposite set in the post-test.

Findings:

- Teachers reported perceiving that IB students have higher levels of motivation, dedication, self-management, questioning, and ability than their regular students.
- Teachers claim to teach the IB students differently from the regular students. IB students were required to do more quality lab work, with less instruction. IB classes have more group work. IB classes also tended to have smaller class sizes too.

- Teachers of IB use greater complexity and faster pace, and require students to use more independent learning.
- Teachers of IB felt that they had to work harder to specialize in their subject areas and also tended to interact more with IB students than with their regular students.
- Students in HL and SL biology score equally well, but higher than students in regular programming. Semestering has no effect on score.
- Students in HL and SL physics score equally well, but higher than students in regular programming. Students in non-semester programming score higher than students in semester programming. Males in all levels performed better than females.
- Students in HL and SL chemistry score equally well, but higher than students in regular programming. Males score higher than females. Males in HL score higher than all other sex groups.
- Cautions include the fact that students in HL groups often only came from one school, whereas the other groups were mixed. Also, the results might be due to the fact that more able students choose IB.

Paper 5: Culross, Tarver. 2007.

Type: Peer-reviewed journal article

This study involved interviewing students and teachers at the end of their first year implementing the IB DP in their school. 24 IB DP students were interviewed, as well as 14 faculty members. Multiple team members conducted the interviews, and then different team members coded the interviews, looking for categories of responses that could be tallied and discussed.

Findings:

- Students who chose IB did so because they believed that it would better prepare them for college, help them gain admission to college, and improve their academic abilities. Students perceived a greater challenge, but not a prohibitive one.
- Students perceive an increased workload with increased teacher expectations of them.
- Some parents believe that the program is an advantage, especially because of its supposed benefits to the college admissions process. Other parents feel that the program is too challenging, requires too much free time, and therefore interferes with other activities, such as sports.
- Students who were high achieving students prior to being in IB found the program to provide a challenge, but students with a more modest academic history instead found the program to be a struggle.
- Teachers of the program perceived the program to require higher level thinking and more difficult content, and therefore also required them to become better teachers.
- Teachers found that the program required the use of additional resources that were not normally needed in their instruction.
- Teachers found teaching the IB program to be stressful.

Paper 6: Hertberg-Davis, Callahan. 2008.

Type: Peer-reviewed journal article

In this qualitative study, 200 teachers, 300 students, 25 administrators, and 8 program coordinators were interviewed and/or observed. These occurred in 23 schools in seven states. Researchers used a grounded theory approach. Schools were visited three times during a year for

data collection. Field notes and interview transcripts were coded. As themes emerged, researchers sought to confirm or deny them. Multiple sets of researchers examined the data to ensure minimal errors and bias in the coding process. In the end, multiple findings about gifted learners and the IB program emerged.

Findings:

- Students who were enrolled in IB courses found them to be more challenging than non-IB courses.
- Students found that the amount of work in the IB program was too intense.
- Students realized that they had to compromise aspects of their social life, or their sleep, in order to stay successful in the IB program.
- Students felt that they were getting the best possible high school education that is currently available to them.
- Students described their IB teachers as being of a higher quality.
- Students described favorable learning environments in their IB classes, with supportive teachers and peers (who are like-minded and also want to learn).
- Students describe the IB teachers as having more favorable interactions with them than regular program teachers. They claim that these teachers treat the students as though they are older and more mature than regular program teachers would.
- Some students who had quit the program claimed that it was because of the "one-size-fits-all" (p. 5 on the printout) approach to instruction. The IB program did not allow for multiple ways of learning, especially given the heavy amounts of content and the need to prepare for the exams. Students explained that there was often a lack of accommodation, or modification, in IB classes.

- Teachers identified struggling students as being those unwilling to do, or unable to manage, the workload, rather than those students who are less academically inclined.
- IB classes tend to be homogeneous in nature due to underrepresentation of minority students and low-income students.
- Students claim that their reason for taking IB was to gain acceptance at a desirable college. Some students believe that this is not even a choice that they have: if they want to gain admission to a good college, they need IB or AP.
- Students also claim to have heard reports about past IB students feeling better prepared for college.
- Some students claim that their reasons for taking IB involved disproving stereotypes that they could not do it, or wanting to be the first in their family to graduate from college, or wanting to gain a different lifestyle than they grew up with.

Paper 7: Foust, Hertberg-Davis, Callahan. 2008.

Type: Peer-reviewed journal article

This qualitative study is part of the larger Callahan 23 schools in seven states study. This study involved a sampling of four of the schools to use for in-depth case analysis. All four schools were within one state, and had populations representative of the diversity of all of the schools. For the purposes of this study, the researchers interviewed 84 participants (48 being female). Data was triangulated (field notes, interview data), and then analyzed using coding. Codes were refined and collapsed into multiple common themes.

Findings:

- Some IB students notice feelings of tension, or difference, between students who take IB in a school and students who do not.
- Students reported that they did not feel as though they needed to choose between taking IB and having a social life, but rather that they could do it all. Students reported that the thing they sacrificed most often in order to have it all was sleep.

Paper 8: Chen, Wu, Tasoff. 2010.

Type: Statistical Report

This report outlines, using only statistical data tables, the likelihoods of various student groups (separated out by race, affluence, ethnicity, family education background, etc…) of completing various numbers of credits, courses, programs, and then enrolling and persisting in college. It does not distinguish IBDP from AP, however, and it also does not look at the effects of IBDP on courses, enrolments, etc… but only looks at student demographics as to their likelihood of enrolling in IBDP or AP. So it only looks at the question of access to the program. The data comes from the Educational Longitudinal Study of 2002, which used a nationally representative cohort of students who graduated in 2004. The study followed those students until 2006 (2 years into their potential post-secondary educations). The findings include:

- White and Asian students are more likely than those of Black, Hispanic, or American Indian populations to enroll in IBDP or AP.
- Students with parents with higher levels of education are more likely than those with parents of lesser levels of education to enroll in IBDP or AP.

Paper 9: Vanderbrook. 2006.

Type: Peer-reviewed journal article

This article examined, through qualitative means, the experiences of five gifted females enrolled in AP or IB. The study combines phenomenological methods with educational criticism methods. This study is part of a larger study. Of the five girls, three were of European descent, one was of Cuban-Lebanese descent, and one was of Chinese descent. Data was collected using phenomenological interviews. Each participant was interviewed three times. Data was transcribed, coded, and member checked. Three of the five girls were following AP programs, and two were following IB programs (both were of European descent and came from lower middle class socioeconomics). The two schools used as sites for the study are found in a large city in the Western United States. The IB school had an enrollment of 2,470 students at the time of the study, and used the school-within-a-school model of IB programming. One of the IB participants, called Bethany, was a senior who graduated with the full IB diploma, and the other participant, called Julie, was a junior who was a certificate candidate. Both of these students only attended this high school for the IB program, as it was outside their school boundaries. Students described the following effects of the IB program on their education:

- Both IB students described the content as being challenging and very difficult, especially at first, possibly because of the lack of prior knowledge from other programming.
- Students in both programs report increased work and difficulty.
- IB students in the study report the creation of strong peer relationships, used for support, understanding, guidance, and common experience. One student (Julie) reported that she created relationships that she might have otherwise been unable to form, based on her history making successful peer relationships in school.

- Students in both programs reported having little to no relationship with school counselors.

Paper 10: Taylor, Pogrebin, Dodge, Tonso. 2002.

Type: Peer-reviewed journal article

This study used interviews with 32 high school students enrolled in either AP or IB to explore whether or not the pressures of these programs encouraged student deceitfulness on assessments. Participants included 18 male, and 14 females in either junior or senior year. The study was a grounded theory approach, using interview-style data to make conclusions about pressures to success as they relate to academic dishonesty. Most of the findings do not distinguish the AP from the IB, but there is one finding in the paper specific to the IB program:

- Students might engage in deceitful behavior on assessments due to competition for grades, and the desire to be successful.

Paper 11: Cavazos, Cavazos. 2010.

Type: Peer-reviewed journal article

This study explored the high school experiences of nine Latina/o students. Seven were female and 2 were male. All were currently in college. The researchers were qualitatively exploring (using interviews) whether or not the students believed that their teachers had high or low expectations of them. A grounded theory approach was used for interview data analysis. One student reported directly on IB experiences:

- A student in this study who pursued an IB education believed that the teachers involved in the program were excellent and among the best teachers.

Paper 12: Amuedo-Dorantes, Mach, Clapp. 2004.

Type: Peer-reviewed journal article

This study quantitatively investigated the relationship between students' schooling and their likelihood to both try and continue to use alcohol, tobacco, and other drugs (ATOD). Data was used to measure the likelihood of use of ATOD (based on their demographic, family, school, and neighborhood characteristics and as determined by a Probit random-effects model). The data came from the 1997 and 1998 NLSY97 which collected survey data on nearly 9,000 youth aged 12-16 years. The results were further analyzed by separating out school-types from the school data, and controlling for all other data, in an effort to see statistical correlational information about school type and substance use. Findings relative to IB report that students attending an IB school are 3% less likely to try cigarettes, and 50% less likely to continue to use cigarettes, than students who attend non-IB schools. There were no statistically significant differences between IB and non-IB school students when it came to alcohol and other drug trial and prolonged usage.

Paper 13: Taylor, Porath. 2006.

Type: Peer-reviewed journal article

This study involved issuing a survey (20 4-point, Likert scale items and 7 open-ended items) to IB graduates from two public school in a large city in British Columbia. The surveys were administered in 2005. One of the two public schools was inner city, and the other served a more middle-class population. Students who had graduated from the years 1996 and 2000 were chosen for the survey. Given the timing of the survey, many of the respondents were just completing their undergraduate work (class of 2000) and many were just completing postgraduate studies or were in the beginning stages of their careers (class of 1996). The response rate for the survey was

fairly low. Of the 76 DP graduates from 1996, seven were able to be contacted and chose to respond. Nine out of 79 from 2000 were able to be contacted and chose to respond. The surveys resulted in the following findings:

- Some students felt that the IB program allowed them to explore an enriched and more worthwhile curriculum.
- Some students sacrificed free time and other extracurricular endeavors in order to be in the program.
- Some students experienced increased stress about not being able to keep up the requirements of the program, or not being able to get into their preferred post-secondary institution.
- Most students reported better feelings of college readiness, both for introductory classes, as well as more advanced classes.
- Some students reported feeling a false sense of preparedness for postsecondary.
- Most students reported feeling better prepared for pursuing their career goals.
- Some respondents reported sacrificing a healthy lifestyle in order to meet the requirements of the program.
- Most students report having developed lifelong skills such as critical thinking skills, strong work ethic, organizational skills, time management skills, and communication skills while in the program.
- Students saved time and money when they were able to take advantage of advanced credits.
- Some students reported feeling less stressed than their counterparts in their first year of postsecondary studies.
- Some students report having access to fewer courses than their peers because of the restraints of their IB schedule.

Paper 14: Foust, Hertberg-Davis, Callahan. 2009.

Type: Peer-reviewed journal article

This paper is also a publication stemming from the Callahan 23 school study. For this sub-study, 84 participants (same grouping as in Foust's other work) were chosen to examine. The study involved using in-depth interviewing and qualitative analysis. From this stem of this study, a few new findings that have not already been included in this systematic review emerged:

- Students report increased feelings of motivation in IB classes.
- Students report having feelings of academic superiority over their non-IB peers.
- Students report that IB participants share a special relationship with each other.
- Students report that they have increased pride in their work because the nature of that work is more challenging.
- Students report that they experience stereotyping for being an IB student by the other students in their schools.
- Students report increased levels of stress due the intensity of their programming.

Paper 15: Fitzgerald. 2015.

Type: Peer-reviewed journal article

The purpose of this study was to investigate whether or not admissions officers at Canadian universities (the study was conducted in Ontario) have a more favorable perception of the IB DP than they do of local Canadian and American curricula. The study is modeled after studies that had already been conducted in the United Kingdom, and in Australia/New Zealand. The study followed a mixed methods, explanatory sequential approach, beginning with the administration of surveys, and concluding with two one-hour long open ended interviews conducted with each

participant. A total of 19 participants, from 8 Ontario universities, could be recruited whose responses could be used. These participants had to self-identify as working with the applications of IB DP students at the onset of their surveys in order for their responses to be used. The major findings of the study include:

- A vast majority of admissions officers believe that the IB DP curriculum is more challenging than local curricula.
- A vast majority of admissions officers believe that the IB DP better prepares students for postsecondary studies than local curricula.
- Some admissions officers believe that the IB DP students make an easier transition to university than their non-IB peers.
- Admissions officers do not seem, however, to be able to agree on what specific abilities the IB DP offers students that regular curricula do not.
- Overall, I would say that the effect of the IB DP on schools represented in this paper is that admissions officers at Canadian universities seem to have a more favorable perception of the IB DP than they have of local Canadian and American curricula.

Paper 16: Mayer. 2008.

Type: Peer-reviewed journal article

This study examines the ways in which students from minority groups (especially Latino and African American students) can be successfully included in the IB program. Most of the study focuses on successful ways to implement the IB program for a wider variety of students, but there are some key findings about what the IB program can do for minority student groups as well. The study took place in an urban, Title 1 school in California that serves a largely ELL and

minority population. The school has one of the lowest API (academic performance index) scores in California. The researcher used open-ended interviews (which were all transcribed and coded) with parents, administrators, program coordinators, teachers, and district representatives to collect her data. A total of 63 interviews were collected over the course of a year, during which she also observed classrooms and recruitment activities to triangulate her data (though she did not use observation data as her primary study data). The IB program in this school is unique because it is an open-access program. Students may seek it out as a magnet program, but no students are excluded. Supports that make the program successful for a wider variety of candidates than are often served in other schools by IB programs include: counseling, academic enrichment opportunities, and social scaffolding. The researcher also mentions two possible effects of the IB program on the students at the school:

- The IB program in the school provides a much needed sense of community to the students it serves.
- A wide range of students can be served by, and be successful in, the IB program, despite the misconception that this is not true due to its level of academic rigor.

Paper 17: Meister. 2011.

Type: Doctoral dissertation

The purpose of this study was to determine whether or not students enrolled in an IB program achieved higher grades on state standardized tests than their non-IB peers. The study was conducted in Kentucky using grade 11 students who were either enrolled in SL IB Mathematics or state Mathematics programming. Results on the Kentucky Core Content Test (KCCT) wer compared. Matched pairs were established between IB and non-IB students. Students were

paired based on PLAN (a grade 10 test serving as a midpoint academic test) school, race, gender, and socioeconomic status. Analysis was done using matched pairs t-testing. The researcher claims a passive design (as he did not impose any manipulations into the study) examining co-variation. The results of the test were as follows:

- IB students scored significantly higher than their matched counterparts, even after additional testing was done pairing the IB students with the highest performing non-IB students.

Paper 18: Saavedra. 2011.

Type: Doctoral dissertation

The purpose of this study was to examine whether or not the IB DP could improve academic achievement, high school graduation rates, and college enrollment for students. The study was conducted using 20,422 students attending high school in one of 13 Chicago Public High Schools. The students were tracked in their grade 11 year, and the study looked at grade 11 students from school years 2002/2003-2006/2007. The Chicago Public Schools investigated tend to serve more low income and minority students than the national average. Despite the schools tending to serve low income and minority students, the IB programs in these schools tend to serve a greater proportion of higher income and White or Asian students than the general education programs. The public schools studied do use admission requirements for their IB programming, requiring that students be at least above the 50^{th} percentile based on seventh-grade testing of basic skills (the Illinois Test of Basic Skills). The data collected came from CPS records of academic achievement, as well as Student Publisher Clearinghouse data on college enrollment. Because the students in the 2 samples (IB vs. non) are non-equals, students in each group were weighted to shift the importance of different members of each sample. The IB

students were weighted so that the strongest students had the least weighting, and the weaker students who more closely resembled the general population students had the greatest weighting. In the non-IB group, students who were the strongest academically had the greatest weighting, with weaker students who would likely not have been admitted to IB having the least weighting. After weighting, the groups were indistinguishable for the measured characteristics. Data was analyzed using a propensity-score selection model and logistic regression analysis. Results were corrected based on possible limitations of the data analysis. The results of the data analysis were as follows:

- Students in IB are more likely to perform higher on their ACT (American College Testing) subject-specific tests, however, the corrected effect, while still present, is likely to be small.
- The estimated effect of IB on high school graduation is significant.
- The estimated effect of IB on college enrollment is significant.
- More girls than boys tend to enroll in IB programming.

Paper 19: Suldo, Shaunessy-Dedrick. 2013.

Type: Peer-reviewed journal article

This study was conducted with grade 9 students enrolled in the IB program (pre-DP studies). One hundred and thirty-four students from three public high schools in a southern state were administered self-report questionnaires at the end of grade 8, and at the beginning of grade 9. This was done as part of a larger study of 480 students ranging grades 9-12. The purpose of the study was to ascertain whether or not students pursuing pre-IB DP education in high school (specifically grade 9) develop higher levels of stress than their peers in regular education courses. The results of the self-report questionnaires from the pre-DP students were compared

with those of 22 regular curriculum students. Analysis included checking to ensure that race, gender, ethnicity, and school did not confound the comparisons between groups with respect to stress. The results were as follows:

- Students in pre-IB DP programs in the three public high schools did develop higher levels of perceived stress than their general education colleagues (see fig. 1, p. 207), but did not display diminished life satisfaction nor induced psychopathology as a result of their elevated stress. This suggests that the pre-IB DP cohort may in fact have better coping mechanisms for their perceived stress levels than their general education peers.

Paper 20: Suldo, Shaunessy, Hardesty. 2008.

Type: Peer-reviewed journal article

The purpose of this study was to examine stress levels in IB students, as compared to their general education peers. Stress levels as they relate to mental health were also studied, and coping mechanisms were examined. This study used participants in a southeastern state school that offered the IB DP (which was taught in conjunction with state curricula), as well as regular state programming. The sample included 307 students: 139 were enrolled in IB programming, and 168 were enrolled in state programming only. Most of the participants in both groups were Caucasian, female, and of average or high socioeconomic status. Students were administered a series of self-report measures, including the Perceived Stress Scale, the Adolescent Coping Orientation for Problem Experiences, the Youth Self-Report form of the Achenbach System (for problem behaviours), the Students' Life Satisfaction Scale, and the Self-Efficacy Questionnaire for Children. Student grade point averages were also examined. Analysis was carried out using

an independent samples t-test, comparing IB students to non-IB students. The results were as follows:

- Students in the IB programme experienced significantly higher perceived levels of stress than their peers.
- Within the IB group, higher levels of stress did correlate with decreased mental health. Perceived stress positively correlated with anger coping. Family communication was negatively correlated with perceived stress, so this might be an effective coping strategy. Positive appraisal and negative avoidance (substance abuse, etc…) did not impact perceived stress. But, positive appraisal and family communication were positively correlated with increased life satisfaction. Anger coping and negative avoidance were negatively correlated with life satisfaction. Negative avoidance was linked with internalizing behaviours like depression or anxiety, and anger coping was linked with externalizing behaviours like aggression and conduct disorder.
- Coping styles were not linked to GPA's.

Paper 21: Bergeron. 2015.

Type: Report prepared for the IBO

The purpose of this study was to examine the enrollment, persistence, and graduation rates of IB DP students in college. Both private and public schools were considered (using the class of 2008). It is effectively a repeat of the Halic study, which uses the class of 2005. Only full DP candidates were considered (and both diploma earners and non-earners were maintained in the study). The study also looked at where IB students were enrolling in college, but these results seem unremarkable to the systemic literature review. Data was collected using National Student

Clearinghouse (NSC) numbers, as well as the IB student information system (IBIS). The results show the IB DP in a positive light, but they are not compared to any numbers for similarly performing non-IB students. The results were as follows:

- 78% of IB DP students enrolled immediately in college compared to a national average of 69%.
- One-year, and 2-year retention rates are 98% and 96% for IB DP students, as compared to 2-year retention rates of 77% for the average student.
- Markedly more IB DP students will graduate from college (79% and 83% in 4 years and 6 years, respectively) than will the average student (56% in 6 years as a national average).

Paper 22: Beckwitt, Van Kamp, Carter. 2015.

Type: Report prepared for the IBO

This study focused on the implementation of IB programmes in 2 school districts in the United States. Both qualitative and quantitative approaches were taken. The quantitative approach looked at grades, SAT scores, exam scores, college enrollment, etc…, but because none of these were compared to the districts' results from pre-implementation, the numbers do not necessarily signify any effects of the IB programmes specifically. The qualitative results were obtained using observation, focus groups, and interview data. Teachers, students, and administrators were all included in the study. The following results were obtained from the data:

- Respondents believed that IB provided a better quality of education that regular programming.
- Funding affects schools implementing the IB DP; implementation (especially training) is expensive.

- Teachers receive extra, good quality, professional development.
- Administrators and teachers perceived increased collaboration between teachers.
- Challenges maintaining adequately trained and qualified staff.
- Challenges of aligning state curriculum with IB curriculum.
- Lack of time for proper implementation available.
- Rigor promotes lack of balanced lifestyle, according to other students. Sleep was cited as being sacrificed in the interest of doing well.
- Better relationship with teachers, as perceived by the students.
- Students perceive a greater opportunity to engage in service, especially as mandated by CAS.
- Students feel the separation of IB students from non-IB students in the school.
- Students perceived the IB DP as providing better college preparedness.

Paper 23: Caspary, Woodworth, Keating, Sands. 2015.

Type: Report prepared for the IBO

This report used National Student Clearinghouse and IB exam data from the years 2008 to 2014 to determine whether or not access in IB DP for low-income students can impact college access, persistence, and graduation. The major findings suggest:

- Access to the IB DP for low-income students improved over the course of the studied time frame.
- Diploma candidate who were low-income had a high tendency to enroll in post-secondary, tended to persist in post-secondary in a manner similar to that of their higher-income peers, and tended to graduate at rates higher than the national average for low-income students.

Paper 24: DiGiorgio. 2010.

Type: Peer-reviewed journal article

This study examined the effects of the IB DP in 2 schools who were establishing themselves as the first IB programmes in their small province (this being the last province to adopt the programme in Canada). The study purports to be an ethnographic case study that merged findings from interviews, observations, and document analysis (e.g., newspaper articles on the introduction of the programme, etc…). Interviews and observations included members of staff (teachers and administrators) as well as students. Key findings include:

- Parents of higher socioeconomic status, or international families, were the most in support of the DP because they already knew about it.
- Parents became the driving factor for student registration. Parents were generally seeking a more elite form of education that would include homogeneous groupings of like-minded, highly motivated students.
- Students who participated in the programme believed that it created a more positive learning culture in their classrooms because they were more able to discuss ideas and share things.
- Some students left the programme after taking one pre-IB year. These students tended to express concerns over the lack of options in scheduling available to IB students, as well as the isolation of the IB classes from the rest of the school population.

Paper 25: Shah, Dean, Chen. 2010.

Type: Report prepared for the IBO

This study examined the college selectivity of IB students, as well as their college performances and graduation rates as compared to their non-IB peers. The study compared IB DP cohorts to

matched groups (matched for graduation year, race/ethnicity, family income, and high school academic performance as indicated by GPA and highest SAT/ACT scores). The study used 8 University of California campuses, and student cohorts from years 2000-2002. A total of 1,547 IB students, and 5,253 non-IB students were considered, making this a fairly large-scale study. Key results were as follows:

- Students from the IB cohorts chose more selective universities than their non-IB peers.
- Students from the IB cohorts had higher GPAs in their first year of college, and at the time of their college graduation, than did their non-IB peers.
- Students from the IB cohorts had higher graduation rates, at both 4 and 6 years, than their non-IB peers.

Paper 26: Verneuille. 2011.

Type: Doctoral dissertation

This study involved a case study using observation data, as well as interview data, in the Sag Harbour school district in New York, as it brought into implementation the IB program at some of its schools. The district already offered the AP program successfully prior to bringing in the IB program. The purpose of the study was to establish the experiences of various stakeholders as the IB program was implemented, as it compared to the AP, and otherwise. Observations were made in the schools, as well as at various meetings. Interviews were conducted with teachers, administrators, and coordinators of the IB program. Interviews were semi-structured, and completed one-on-one. Key findings of the impacts of the IB program on the stakeholders interviewed and observed included:

- increased stress and a greater perceived level of difficulty for students.

- many benefits over the AP program.
- better learning environment, or an improved culture for learning in the schools.
- greater collaboration among colleagues (teachers) in the program.
- greater stress for teachers who were teaching IB courses.
- increased perceived college readiness for students.
- teachers and students required supports in order to successfully implement an IB program.

Paper 27: O'Connor. 2011.

Type: Doctoral dissertation

This study aimed to examine the supposed benefits of an IB program on the non-participants within a school. This was done by considering what the school claimed to be the benefits, as well as the seeming accurateness of those claims. The study used interviews with school and district representatives, as well as reviews of other data and documents (achievement data, etc…), in a case study design. The findings of the study are as follows:

- The IB program increased enrolment and allowed for private school students to return to the public school. The increases in enrolment often brought along with them enough numbers to increase revenues enough to more than justify the costs of the magnet programming. The increases in enrolment, in this study, saved a school that had projected declines in enrolment, and shifted those declines to gains.
- The presence of the IB classes created disparity in numbers of students in IB classes versus regular program classes. The IB classes had fewer numbers, and the regular classes were large.

- Because of the additional demands of the IB program, teachers who shared their time between IB classes and regular classes reported spending more time on their IB assignment than their regular assignment.
- Teachers who received IB training reported improving their teaching practices in all of their assigned classes, including their regular classes.
- Teachers viewed having IB classes in their schedules as being an elite assignment, and teachers who were only receiving low-end regular courses often felt a disparity between themselves and their IB colleagues on account of not receiving the same schedules.

Paper 28: Austin-King, Lee, Little, Nathan. 2012.

Type: Report

This report represents the changes in enrolment numbers in AP, IB, PSEO, and Concurrent Enrollment programs in Minnesota for the years 2006 to 2011. Data was provided to the authors by the education department of Minnesota. The results pertaining to the IB program are as follows:

- For the period of time studied, enrolment in the IB program increased for minority students more significantly than it did for white students.
- For the period of time studies, enrolment in the IB program increased for low and moderate socioeconomic students more significantly than it did for high socioeconomic students.

Paper 29: Jarva. 2013.

Type: Doctoral dissertation

This study uses a grounded theory approach to investigating the impacts of the IB DP on an urban high school in Minneapolis, Minnesota. The school had recently implemented the IB DP and the experiences of various stakeholders who had been a part of the building years of the program were sought. Interviews were conducted with 4 principals, 4 coordinators, 15 teachers, and 20 students. The interviews were transcribed, coded, and analyzed for themes. Amongst the findings of this study, the following impacts of the IB DP emerged in the data:

- According to interviewed students, the program is more difficult and many students drop out from the first year to the second. Reasons for this include the level of difficulty, but also extend to the rigidity of the program's scheduling, as well as the supposed lack of payoffs for the extra work.
- The program does include higher stress levels for the students enrolled.
- The students who had graduated from the IB DP did perceive increased preparedness for college.
- Students also reported perceiving better abilities than their peers to critically think, and claim to have received a superior education in other ways as well.

This paper goes on to look at the perceived successes and challenges of having implemented the program, especially from an educator and administrator's perspective, and would be a valuable paper to read for any leaders considering implementing the IB DP in their own schools. The bulk of this paper does not, however, report on effects of the program, but rather on the logistics of its implementation.

Paper 30: Aulls, Lemay, Pelaez. 2013.

Type: Report prepared for the IBO

The purpose of this study was to examine the effects of having completed the extended essay portion of the IB DP on 15 students who were now enrolled in first year university courses in Quebec. The study was a 2 phase exploratory study that involved 1) ascertaining whether or not IB DP students had improved inquiry self-efficacy scores as compared to their non-IB peers, and 2) ascertaining whether or not the IB students in the study report on feeling increased academic preparedness for college on account of having participated in the extended essay. The findings were as follows:

- IB students reported having slightly higher inquiry self-efficacy scores than their non-IB counterparts.
- The IB students involved in the study believed that their experiences in the extended essay did help them to be better prepared for university work by improving various research, organization, and academic skill sets. The IB DP afforded students a better learning environment for developing those skills.

Paper 31: Inkelas, Swan, Pretlow, Jones. 2013.

Type: Report prepared for the IBO

This mixed methods study used first year students at the University of Virginia to explore whether the extended essay of the IB DP had any impact on a student's perceived preparedness for university, as well as whether or not extended essay performance could be used as a predictor for DP results and university GPA. The researchers wished to determine whether or not students who had completed the extended essay had any advantage in terms of preparedness in college as

compared to students who had not completed it. They chose to compare a sample of IB students (n=1,045) to a sample of AP students (n=1,046) to do this. Students were administered a survey ascertaining their perceived level of preparedness for various university classes, based on a variety of high school experiences. Follow up to the quantitative phase included focus group meetings with 39 students and individual interviews with 2 IB students who had reported on feeling well prepared for university. Key results were as follows:

- The IB students in the sample reported greater perceived preparedness for university, especially in the area of research, than their AP counterparts.
- The IB students believe that the extended essay helped to prepare them for the rigors of university, especially research focused endeavors.

Paper 32: Halic. 2015.

Type: Report prepared for the IBO

The purpose of this study was to examine the enrollment, persistence, and graduation rates of IB DP students in college. Both private and public schools were considered (using the class of 2005). Only full DP candidates were considered (and both diploma earners and non-earners were maintained in the study). The study also looked at where IB students were enrolling in college, but these results seem unremarkable to the systemic literature review. Data was collected using National Student Clearinghouse (NSC) numbers, as well as the IB student information system (IBIS). The results show the IB DP in a positive light, but they are not compared to any numbers for similarly performing non-IB students. The results were very similar to the Bergeron findings (similar study but using 2008 – more current – data). Students from the IB DP are more likely to

enroll in, persist in, and graduate from college, as compared to students in the general population.

Paper 33: Cortes, Moussa, Weinstein. 2013.

Type: Peer-reviewed journal article

This study aimed to examine whether or not the IB DP had an impact on academic outcomes while students are in the program. The students examined were from the Chicago Public Schools group. The test group involved looking at schools that did adopt the IB DP and comparing those to a control group of schools that did not adopt the IB DP. Both groups were studied before and after the adopting of the IB in the test group ensuring that the time period was the same for both groups. The study employed a difference-in-differences framework to quantitatively analyze the data. Chicago Public Schools provided the data for the study. Eleventh grade students were considered from 1993-1994 until 2005-2006. Data provided were corrected for a variety of factors including demographic factors, as well as school-specific factors. Students within one single school could not be compared against each other, as those who choose the program tend to be of greater academic ability than those who generally do not (non-random sampling). Therefore the design included comparing schools with and without the program, and correcting for school site differences instead. The results of the analysis are as follows:

- Grade 11 academic achievement is improved with enrollment in the IB DP. Students see higher scores predominantly in math, but the overall likelihood of receiving a B or better is improved.
- High school drop out rates decrease for students enrolled in the programme. This is mostly true for African American students.

- High school completion rates increase for students enrolled in the programme. This is mostly true for African American students.

Paper 34: Conley, McGaughy, Davis-Molin, Farkas, Fukuda. 2014.

Type: Report prepared for the IBO

The study represented in this paper was a three-phase project. Students of 2 different groups (honours/non-IB and honours/IB) were compared against each other for academic college readiness and college persistence (phase 1), non-academic college readiness (phase 2), and non-academic college readiness again (phase 3). The student population were all in attendance at the University of Oregon's Honors College. The students were presumed to have had comparable high school performances given the nature of the college, and were sorted based on whether or not they had participated in an IB DP in high school as well as other demographic characteristics. The study used data ranging from years 2005-2012.

Phase 1 used data extant data provided by the college to compare academic performances in both groups. The IB group was relatively small (n=196) as compared to the non-IB group (n=1,495). A regression analysis was conducted that corrected for minority status and gender. Persistence data were also compared between the 2 groups.

In phase 2, self-report surveys were conducted for quantitative analysis. The survey issued was the CampusReady survey that examines metacognitive, cognitive, and college adjustment items. Sixty IB students, and 65 non-IB students participated. The items in the survey are 5-point Likert in nature, and were compared using t-test analysis.

In phase 3, qualitative data about college readiness in the 2 groups was collected using design charettes. The charettes involved 20 hours of workshop-style data collection over a period of 2

days (recordings, photographs, field notes, and other artifacts were collected). Eighteen IB students were compared to 18 non-IB students. Each group was selected to be as broadly representative of the possible demographics as possible.

The results of each phase of the study are as follows:

- In phase 1, researchers discovered that the IB DP group had a greater propensity to do well on a math placement exam, but that there was no statistically significant difference between college GPA's of the 2 groups.
- In phase 1, researchers discovered that the IB DP group had a greater probability of persisting in college than their non-IB peers.
- In phase 2, researchers uncovered no statistically significant difference between the responses of the IB group as compared to the non-IB group (i.e., based on this survey, both groups reported feeling as prepared for college as one another).
- In phase 3, IB students reported a greater level of college readiness as compared to the non-IB group based on certain factors other than those studied in phase 2 (i.e, better able to handle increased workload, better prepared for high-stakes finals, and better able to manage their time).

Paper 35: Duarte. 2013.

Type: Doctoral dissertation

This study involved a qualitative exploration of the impact of the IB DP on 2 different California high schools. The researcher was particularly interested in the effects of the programme on non-participants, and therefore sought to explore the effects of the programme on overall school climate and culture. At each school, three individual interviews were conducted (principal, IB

coordinator, and an IB teacher), along with a focus group session (all non-IB teachers). Also, field notes and artifacts from visits to each school were collected. The data is presented to the reader largely in narrative form, but was also transcribed and coded wherever possible. Codes were grouped together and examined for themes. Each major emergent theme is discussed from the perspective of school climate and school culture. The themes emergent themes were as follows: school pride, IB diploma requirements, instructional techniques, school within a school, earned and entitles IB student privileges, and school and IB missions. Both of the schools in question are large schools that have school within a school IB DP's. One of the schools is in an affluent area, and one of the schools is less so. Despite the differences in the schools, the researchers note that the interview sessions from both schools yielded very similar responses, as did the focus group sessions from both schools. The results of all of the gathered data are as follows:

- The IB DP can improve a school's image in the community, which can lead to a better reputation as well as higher enrolment.
- The IB DP can raise the bar in terms of academics throughout the entire school.
- The IB DP ensures that students learn a variety of lifelong learning skills.
- Teachers collaborate more as a result of the program.
- The presence of the program can create a disparity of resources in the school, with IB receiving things that other programs do not.
- Teachers perceive increased workload in IB.
- Students of the program become isolated from the core school culture.
- Colleges give special consideration to the IB students as compared to other students.
- IB students perceive a higher level of stress than their peers.

- The IB students seem to have an increased sense of entitlement as compared to their peers in the school.

APPENDIX B

Coding Process Work

Author	Text	Effect of the program	Code	Category
Coca, Johnson, Kelley-Kemple, Roderick, Moeller, Williams, and Moragne. 2012.	"We found that the majority of IB Cohort students (59 percent) enrolled in a four-year college and an additional 13 percent enrolled in a two-year college…The college enrollment patterns of students who were in the IB Cohort as of freshman year look better than those high achieving students not in the IB Cohort (49 percent enrolled in a four-year college and 15 percent enrolled in a selective four-year college." (p. 20)	increased college enrolment	improved college outcome	College
	IB students are more likely to choose a selective college. 31% of non-IB students versus 48% of students who 'complete the program. (See Table 2 statistics, p. 20.)	increased choice of selective college	improved college outcome	College
	"When examining the persistence rates of IB Cohort students who enrolled in a four-year college immediately after graduating from high school (graduating cohorts 2003-2007), we found that the majority (75 percent) stayed in college two years after starting…This rate was 11 percentage points above the average rate of students with high test achievement (64 percent)." (p. 21)	increased college persistence	improved college outcome	College
	"…students felt that the IB program provided them with a strong foundation for college, both by building core academic skills (e.g., critical thinking, analytical writing) and by transmitting specific content knowledge (e.g., literary forms, world languages). Students were particularly confident about the strength of their analytical writing skills…Finally, the IBDP students whom we interviewed consistently described their own academic behaviors – their motivation, work habits, organization, and time management – as strengths." (pp. 31-32) "…they discussed a wide range of behaviors and beliefs that they felt were critical to their success. We have categorized these competencies into three themes that students consistently cited as important: organization and time management skills, help-seeking behaviors, and motivation." (p.37)	increased feelings of academic readiness for college	improved college outcome	College

Author	Text	Effect of the program	Code	Category
	"IBDP students' ability to seek help from peers and mentors is perhaps not surprising, given their experiences in high school. It appears to be very clear that IBDP students develop a strong belief in the necessity of having and relying upon an academic community during their high school years in the program. In IBDP students' interviews in high school, a strong sense of community – both among peers and between students and teachers – emerged in each program." (pp. 42-43)	strong interpersonal relationships in the program	improved school climate	School Climate
	"The IBDP students whom we interviewed were highly motivated and goal-oriented." (p. 44)	feelings of motivation and goal-orientation	positive non-academic outcome	Non-Academic
	"A number of the IBDP students whom we interviewed described gradually realizing that they *belonged* in college, that they were as smart as (and, in some cases smarter than) their college peers." (p. 45, emphasis in original)	feelings of strong academic identity	positive academic outcome	Academic
Perna, May, Yee, Ransom, Rodriguez, Fester. 2015.	"Figure 6 shows that the proportion of free or reduced price lunch eligible students participating in IBDP increased only slightly in recent years, from 13% in 2006 to 7% in 2009, despite the concurrent increase in the availability of IBDP at schools with high percentages of low-income students (Figures 3 and 4)." (p. 412)	lack of enrolment of diverse and low-income students in IBDP (even though it is available to them)	lack of access	Access
Shaunessy, Suldo, Hardesty, Shaffer. 2006.	"…both groups of IB students reported more positive perceptions of student-teacher relations and student interpersonal relations than general education students. Additionally students in general education reported a more negative perception of the manner in which resources were shared in the school, [] as well as the order and discipline within the school." (p. 82)	better relationships with teachers	improved school climate	School Climate
	"Both groups of students in the IB program achieved better school grades and felt more confident in their abilities to manage their own learning behaviors, to master academic material, and to fulfill academic expectations than students in general education…both gifted and high-achieving students in the IB program had better attendance and received fewer discipline referrals than students in general education." (p. 82)	increased academic performance	positive academic outcome	Academic
		better self-management skills	positive non-academic outcome	Non-Academic

Author	Text	Effect of the program	Code	Category
	"Regarding satisfaction with important domains of life, groups differ on two domains (satisfaction with friends and with living environment)." (p. 82)	higher level of psychological well-being	positive non-academic outcome	Non-Academic
	"…students in the general education group reported more externalizing symptoms of psychopathology (that is, aggressive and rule-breaking behaviors) than both gifted and high-achieving students in the IB program….Regarding peer functioning, the effect of group membership on negative peer affiliations was larger. Gifted and high-achieving IB students were similar to each other and less likely than students in general education to report affiliation with negative (i.e., rule-breaking) peers." (p. 83)	lower levels of emotional and social distress	positive non-academic outcome	Non-Academic
Poelzer, Feldhusen. 1996.	"All reported that IB students, compared with regular students, show relatively high levels of motivation, task commitment, questioning, independence, intelligence, ability to see connections among concepts, desire to understand, management skills, and taking responsibility for their own learning. They found that IB students support each other a lot in their endeavors, and that they typically score 10% to 15% higher than regular students on the provincial diploma exam." (p. 7)	higher level of motivation	positive non-academic outcome	Non-Academic
		development of thinking and learning skills	positive non-academic outcome	Non-Academic
		IB cohort as support group	positive non-academic outcome	Non-Academic
	"All teachers taught IB students differently from regular students. They required IB students to do more laboratory work of very high quality and do the lab assignments with minimum direction…Overall, much more group work occurred in IB classes than in regular classes." (p. 7)	increased workload	negative academic outcome	Academic
		better quality work	positive academic outcome	Academic
	"Teachers of IB students reported dealing with concepts at a more complex level and at a faster pace." (p. 7)	higher level thinking	positive academic outcome	Academic
		faster pacing	negative academic outcome	Academic
	"teachers had to work hard to have a large knowledge base in their subject specialties, teachers enjoyed interacting with students and tended to interact more with IB students than with regular students." (pp. 7-8)	better quality of teacher	positive academic outcome	Academic
		better relationships with teachers	improved school climate	School Climate
	"in all sciences, students in IB out-performed students in regular programs." (p. 1)	increased academic performance	positive academic outcome	Academic

Author	Text	Effect of the program	Code	Category
Culross, Tarver. 2007.	"Students who chose to participate in IB did so to gain an advantage in the college admissions process, particularly at selective institutions and to better prepare themselves for college study." (p. 57)	perceived increased college admission	improved college outcome	College
		perceived increased college preparedness	improved college outcome	College
	"The program is perceived to be quite challenging, but not overwhelming." (p. 57)	increased challenge	positive academic outcome	Academic
	"IB students perceive that teachers' expectations of them have increased since entering the program." (p. 57)	increased workload	negative academic outcome	Academic
	"[parents] who are supportive [about the program] tend to be seeking an advanced learning experience for their children that will advantage them in the college admissions process. [Parents] who express concerns about the program feel the students' increased workload impacts negatively on family time and the students' extracurricular activities, such as sports." (p. 57)	perceived increased college admissions by parents	improved college outcome	College
		sacrifice of social life	negative non-academic outcome	Non-Academic
	"…perceived differences between high achieving students who enrolled in IB and those with a more modest academic history, comments suggest that while the highest achieving students found the program challenging, those who were more modestly successful academically prior to entry into IB found the program to be a struggle at times." (p. 58)	students with modest academic histories find the program to be a struggle	negative academic outcome	Academic
	"[teachers] perceive IB as focusing more on global issues, requiring higher level thinking skills, applying learning, developing links between concepts, and covering a braoder spectrum of topics." (p.58)	higher level thinking	positive academic outcome	Academic
	"IB faculty report that the program has challenged them to become better teachers…" (p. 58)	better quality of teacher	positive academic outcome	Academic
	"[teachers] found that a considerable amount of outside material was required for teaching the courses." (p. 58)	increased need of resources	challenge to school climate	School Climate
	"Faculty perceive teaching IB classes as very stressful, even though they are highly educated, highly experienced teachers." (p. 58)	increased stress for teachers	challenge to school climate	School Climate

Author	Text	Effect of the program	Code	Category
Hertberg-Davis, Callahan. 2008.	"Students enrolled in AP and IB courses judged the content included in AP and IB courses to be appropriately challenging and at a higher level of difficulty than that included in non-AP and –IB courses. Indeed, most AP and IB students seemed to view taking AP and IB courses as an opportunity to escape from the drudgery of less challenging courses." (p. 3)	increased challenge	positive academic outcome	Academic
		higher level thinking	positive academic outcome	Academic
	"Many students indicated that the amount of work they received in AP and IB courses was too heavy." (p. 3)	increased workload	negative academic outcome	Academic
	"I was told if you took IB you would have no life…my social life is very important to me…They were like, "If you take IB you're not going to have time to talk on the phone, you are going to miss your favorite TV shows. You are going to be stuck in a book all day…you are going to have these long papers to write, these big essays." I was like, "Well, it can't be that bad." So, you come here and a lot of it is true, (student focus group interview)." (p. 4)	sacrifice of social life	negative non-academic outcome	Non-Academic
	"Overall, students in AP and IB classes seemed to believe that they were getting the best education their high school had to offer, making the sacrifices worth it." (p. 4)	increased perception of the quality of education	positive academic outcome	Academic
	"AP and IB students were very vocal about the generally high caliber of their teachers, describing them as dedicated, hardworking, skilled, and knowledgeable." (p. 4)	better quality of teacher	positive academic outcome	Academic
	"Overwhelmingly, students in AP and IB courses indicated that the learning environments were supportive and generally superior to general education courses and preferred AP and IB classroom environments. An IB student commented that learning in her IB classes was an improvement over other classes she had taken: "I find it much more fulfilling than I think other classes have been. More because of the experiences and the people and the teachers" (student focus group interview). (p. 5)	higher perception of school climate	improved school climate	School Climate

Author	Text	Effect of the program	Code	Category
	"One of the most potent characteristics of this relationship for AP and IB students was their sense that their AP and IB teachers treated them like adults." (p. 5)	better relationships with teachers	improved school climate	School Climate
	"some students indicated that the 'one-size-fits-all' curriculum and instruction of AP and IB courses did not match the way they liked to learn. Interviews with 28 gifted students in 10 schools who had chosen not to continue taking AP courses or who dropped out of IB programs revealed that not all talented secondary students found these courses to be a good educational fit" (p. 5 on the printout). "One student who decided to drop out of the IB program expressed her frustration with the lack of modifications made in her IB English classes to meet her needs." (p. 6)	rigidity and lack of flexibility of the program	challenge to school climate	School Climate
	"Interviews with many AP and IB teachers confirmed that students who struggled most in these courses were not incapable intellectually but rather were those students who came to the courses without the appropriate time management and study skills." (p. 6)	some students lack proper motivation and skills to be successful	negative academic outcome	Academic
	"Underrepresentation of minority students from low-income backgrounds inmost of the AP and IB programs involved in our study resulted in relatively homogeneous classrooms." (p. 6)	lack of enrolment of diverse and low-income students in IBDP	lack of access	Access
	"Students revealed that they believed that taking AP and IB courses was crucial to acceptance at top-tier colleges." (p. 7) "Furthermore, many students indicated that they did not feel that they had a choice as to whether or not to take AP and IB courses; they believed that one had to take these courses to get into a good college – and the more courses, the better." (p. 7)	students believe they must have IB courses to get into college	negative college outcome	College
	"Numerous AP and IB students mentioned that the reports they had heard of how prepared postgraduates felt for college after taking AP and IB classes had inspired them to take the courses." (p. 7)	perceived increased college preparedness	improved college outcome	College

Author	Text	Effect of the program	Code	Category
	"For many rural, low-SES, and/or minority students, taking and succeeding in AP or IB course cam with powerful stakes attached, including disproving racial stereotypes, being the first in a family to graduate from college, and the opportunity to escape a lifestyle they did not wish for themselves." (p. 8)	desire to disprove stereotypes and improve one's lifestyle	positive non-academic outcome	Non-Academic
Foust, Hertberg-Davis, Callahan. 2008.	"IB students, on the other hand, did report the existence of a range of negative feelings between program participants and nonparticipants. They attributed negative reactions to the IB program structure (i.e., the required course sequence and schedule and the requirement that students take multiple IB courses), which they felt limited their ability to be exposed to and interact with nonparticipants in the program" (p. 3). "Another IB student noted, 'There is a very strong divide between IB and non-IB. Not like real strong, because I don't think people really discriminate, but it's there.'" (p. 3)	feelings of isolation from core school culture	challenge to school climate	School Climate
	"In fact, the students in this study did not suggest in their responses a need to choose between having a social life and achieving academically at all. They believed they could successfully balance both…However, in order to have enough time to have it all, time for a heavy workload and time to spend with friends, most students indicated they had to sacrifice something…Most students in this dilemma chose to sacrifice sleep." (p. 3)	sacrifice of sleep	negative non-academic outcome	Non-Academic
Chen, Wu, Tasoff, 2010.	See Table 4 of Report (enrolment statistics for the IBDP and AP courses)	students of particular races (predominantly white or Asian), or of particular family background (parents have higher levels of education) are more likely than their peers to enroll in either IBDP or AP	lack of access	Access

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Vanderbrook, 2006.	"In contrast, Bethany and Julie, both IB participants continually used the term challenge in the context of not understanding a particular concept. For both IB participants, science class posed a particular challenge (again, because of lack of instruction in previous schooling). In describing her experience in first-year IB Physics class, Bethany stated, 'I didn't understand force. I didn't understand magnitude. I didn't understand (pause) it was really, really hard.' Julie said that she encountered a similar experience in chemistry class. Julie felt that she never caught up with the course material she missed because of an illness." (p. 140)	high perceived level of difficulty of the program/struggle	negative academic outcome	Academic
	"All of the young women commented that, up until their junior and senior years, they experienced an easy time in school. Therefore, when the AP and IB programs began their junior year, it was difficult for them to adjust to the increased amount of work, as well the increased difficulty." (p. 140)	increased workload	negative academic outcome	Academic
	"All participants cited their peers as a source of both academic and emotional support." (p. 143) "Although the IB participants did not mention the existence of formal peer support systems, such as the creation of study groups, both participants emphasized the important role that peers played in providing support in the IB program. Particularly in the IB program, the participants expressed that the IB students felt as if they were going through a shared experience that was different and apart from the experience of the other students attending Arlington High School. As a result of this collective experience, the IB students relied on one another and drew support from each other." (p. 143) "One IB participant, Julie, historically had experienced a difficult time relating to peers; however, the IB program afforded exposure to intellectual peers who accepted and appreciated her. She felt safe in the IB program because she was one of many 'smart kids,' and therefore, not as clear of a target for ridicule." (p. 143)	creation of strong relationship with peers	improved school climate	School Climate

Author	Text	Effect of the program	Code	Category
	"With the exception of Chloe's positive experience with her counselor and an instance when Bethany's counselor called her in to intervene with a worrisome grade, the counselors at these two schools did not address the participants' emotional needs and did not provide career advice. Aside from providing basic support in college applications and some advice on classes, the participants reported that they had no conversations with their counselors regarding their present or future lives." (p. 144)	lack of guidance and support	challenge to school climate	School Climate
Taylor, Pogrebin, Dodge, Tonso, 2002	"Competition for grades can lead to dishonest behavior on the part of students. A senior boy who is enrolled in the International Baccalaureate Program, the most prestigious in the metropolitan area, described the feelings of desperation in a highly competitive school situation: 'Success is a good grade, and we have a lot of cheating problems in my sophomore year. Someone stole the answers to a few history tests. People will cheat, I mean if you consider the pressure to get good grades.'" (p. 408)	increased pressure leads to academic dishonesty	negative academic outcome	Academic
Cavazos, Cavazos, 2010	"Betty also reported that her teachers had high expectations of her abilities. Her comment proceeded as follows: 'I was accepted into what is called the International Baccalaureate [school with specific admission requirements] my junior year and I must say those teachers are excellent. They are probably some of the best high school teachers I've ever seen. It's a very rigorous program and I didn't know about it until one of my teachers encouraged me to apply." (p. 101)	better quality of teacher	positive academic outcome	Academic
Amuedo-Dorantes, Mach, Clapp, 2004	See table 4 (p. 96) "Similarly, juvenile initiation into cigarettes is 3% less likely in schools offering international baccalaureate programs than in schools not offering this program." (p. 96)	decreased initiation to cigarette smoking	positive non-academic outcome	Non-Academic
	See table 5 (p. 97) "Lastly, twenty-first century and international baccalaureate programs not only help to diminish youths' initiation into smoking, but also reduce their repetitive use of cigarettes by about 50% each." (p. 97)	decreased repetitive use of cigarettes	positive non-academic outcome	Non-Academic

Author	Text	Effect of the program	Code	Category
Taylor, Porath, 2006	"Overall, a strong majority of those surveyed felt that the IB Program provided them with an intellectually stimulating curriculum. In retrospect, they were comfortable with the pace of instruction and enjoyed the broader range and deeper understanding of the topics." (p. 153)	increased challenge	positive academic outcome	Academic
		higher level thinking	positive academic outcome	Academic
	"Only 18.75% of respondents felt that they participated in fewer extracurricular activities than they would have had they been in a non-IB program." (p. 153) "Half of the respondents indicated that they had to give up free time and spent less time with their friends who were not in IB." (p. 153)	sacrifice of social life	negative non-academic outcome	Non-Academic
	"Of the respondents, 68.75% had worried that they were not going to be able to meet the requirements of the IB Program, and 43.75% recalled fearing that they would not be accepted into the postsecondary institution of their choice." (p. 153)	increased stress	negative non-academic outcome	Non-Academic
	"Eighty-seven and a half percent of respondents felt that they were better prepared for introductory level postsecondary courses." (p. 153) "The majority (68.75%) also felt better prepared for advanced-level postsecondary courses." (p. 153)	perceived increased college preparedness	improved college outcome	College
	"…50% of respondents indicated that they felt less stressed during the first year of postsecondary studies than their classmates who had not been in the IB Program." (p. 153)	less perceived stress compared to colleagues in first year postsecondary studies	improved college outcome	College
	"Sixty-two and a half percent of the respondents were granted advanced credit for some of their first-year courses, and those who chose to apply those credits stated that this freed up time to pursue other interests." (p. 153)	savings of time and money with advanced credits	improved college outcome	College
	"…12.5% reported a false sense of preparedness for postsecondary studies." (p. 153)	false sense of readiness for college	negative college outcome	College
	"Four respondents indicated that they sacrificed a healthy lifestyle,…" (p. 154)	sacrifice of healthy lifestyle	negative non-academic outcome	Non-Academic
	"…all other respondents indicated that they have carried forward a strong work ethic; critical thinking, organizational, time management, and communication skills; a broader perspective of the world; and life-long friendships." (p. 154)	development of lifelong skills	positive academic outcome	Academic

Author	Text	Effect of the program	Code	Category
	"…three indicated that they had a narrower selection of courses than they would have had outside the IB DP." (p. 154)	rigidity and lack of flexibility in the program	challenge to school climate	School Climate
Foust, Hertberg-Davis, Callahan, 2009	"The comments suggesting some degree of intellectual superiority over non-participants were not as common and consistent as those suggesting superior motivation, but they did emerge." (p. 9)	increased feelings of academic superiority over peers	negative non-academic outcome	Non-Academic
	"The comments suggesting some degree of intellectual superiority over non-participants were not as common and consistent as those suggesting superior motivation, but they did emerge." (p. 9)	increased feelings of motivation	positive non-academic outcome	Non-Academic
	"AP and IB students noted that they considered many of their AP and IB classmates 'friends' and consistently referred to the 'special bond' that existed among them. Many students reported that their friendships with other AP and IB students were long-standing." (p. 9) "Many students noted that these friendships were nurtured by shared experiences and an ability to help each other academically." (p. 9, 10)	creation of strong relationship with peers	improved school climate	School Climate
	"Another major benefit of taking AP and IB courses that students consistently noted was the pride and confidence they derived from taking on the challenging work in AP and IB courses." (p. 10) "As a group, interviewed AP and IB students believed that the workload, content, and pace of these advanced classes resulted in greater challenges than they experienced in general education courses, and they derived pride from being able to rise to the challenges." (p. 10)	increased feelings of pride in their work	positive non-academic outcome	Non-Academic
	"Most AP and IB students perceived an unflattering stereotype of AP and IB students among other students at their schools." (p. 10) "IB students also felt prejudged; they noted that they were perceived by non-IB students as arrogant, 'exclusive,' or 'snobby' (Ignacious, SFG5)." (p. 10)	perceived judgment from other students in the school	challenge to school climate	School Climate

Author	Text	Effect of the program	Code	Category
	"Students reported experiencing frequent stress and pressure to excel, leading to a variety of consequences." (p. 11) "Another IB student said: 'The problem is that I'm one of those people that has to excel at things. And so I kind of work myself to death in IB because I'm trying to be at the top. And we have certain people in our class who are very, very, very at the top. And so I try to fight myself up to this elite group, and it causes a lot of stress.'" (p. 11)	increased stress	negative non-academic outcome	Non-Academic
Fitzgerald, 2015	"Canadian admissions officers are very positively disposed towards the IBDP, particularly when compared to Canadian provincial and US high school curricula." (p. 22)	higher perception of the program by universities	improved college outcome	College
Mayer, 2008	"We feel that one thing which the IB program provides, which is very seldom accomplished in public schools, is a sense of community." (from interview data, p. 228)	perceived sense of community	improved school climate	School Climate
	"In 2006, 48 of the 55 diploma candidates went on to college. Findings from this study suggest a wide range of students can succeed in a rigorous academic program like IB." (pp. 229-31)	increased success for minority students	improved access	Access
Meister, 2011	"The results were so skewed that, in order to confirm the differences seen, additional tests were conducted that purposely paired IB students with the highest performing students of the matching group. Results of these modified tests still indicated that the IB students scored significantly higher than the matched counterparts." (p. 12)	increased performance on standardized tests	positive academic outcome	Academic
Saavedra, 2011	"Based on my propensity score analysis, in which I assume that I^{-} equals 1, I estimate that IB enrollment increases students' ACT scores by 0.5 S.D.s – or 1.7 points (0.5*3.3) – to 19.1 points. If I instead assume an arguable more reliable level of I^{-} of 2, the lower bound of the 95% confidence interval around the IB enrollment impact is 0.08 S.D.s, indicated that when I^{-}=2, IB enrollment increases students' ACT scores by 0.3 points (0.08*3.3) to 17.9 points. These calculations suggest that while IB enrollment is contributing to CPS's progress toward meeting the 'ACT 20' goal, the practical impact is likely to be small." (p.25)	increased performance on standardized tests	positive academic outcome	Academic

Author	Text	Effect of the program	Code	Category
	"I estimate that IB enrollment increases to a substantial extent the probability that students will graduate from high school, contributing in a meaningful way to this critical objective of high school." (pp.25-26)	increased high school graduation rates	positive non-academic outcome	Non-Academic
	"Even when $\bar{\Gamma}$=2.5, the *p*-value associated with the upper bound on the impact of IB enrollment on students' probability of college enrollment is less than 0.05. Therefore, though my estimate that IB enrollment increases students' probability of college enrollment by 38% is likely to be overstated, it is unlikely that selection bias could completely negate the impact of the IB enrollment." (p. 26)	increased college enrollment	improved college outcome	College
Suldo, Shaunessy-Dedrick, 2013	"Results of the current study confirm this elevated stress [associated with IB programming] is apparent as early as ninth grade, and provide preliminary evidence that stress among IB students is higher than what is present before they begin high school." (p. 211)	increased stress even in years of pre-enrollment	negative non-academic outcome	Non-Academic
	"Thus, despite the increased stress, students in the IB program did not develop more symptoms of emotional distress than their peers in general education during the transition to high school and instead evidenced quite positive psychosocial adjustment. These findings suggest that either IB students have unique resources that allow them to experience academic stress without manifesting compromised emotional functioning, or other positive features of the accelerated curricula serve to facilitate wellness and offset the potential negative impact of stress." (p. 212)	improved coping mechanisms	positive non-academic outcome	Non-Academic
Suldo, Shaunessy, Hardesty, 2008	"Students in the IB program reported significantly higher scores on the PSS [perceived stress scale] than students not enrolled in the IB program (t=-2.77, p<0.01)." (p. 280)	increased stress	negative non-academic outcome	Non-Academic

Author	Text	Effect of the program	Code	Category
Bergeron, 2015	"When the results from this study are compared to national rates (as available) it is evident that diploma students, both earners and non-earners, enroll, persist, and graduate on time at notably higher rates. Diploma earners have generally slightly higher rates than non-earners. • Immediate enrollment for all diploma students was 78% compared to the national average of 69% • 2-year retention for all diploma students was 96% compared to the national rate of 77% • 2-year retention rates for diploma earners was 96% compared to the non-earners rate of 95% • 6-year graduation rates for all diploma students was 83% compared to the national rate of 56% • 6-year graduation rates for diploma earners was 87% compared to the non-earners rate of 72%" (p. 12)	increased college enrollment	improved college outcome	College
		increased college persistence	improved college outcome	College
		increased college graduation	improved college outcome	College
Beckwitt, Van Kamp, Carter, 2015	"During the focus group, students were asked how IB program implementation affected their relationship with teachers. The two themes that arose were: (1) teachers are willing to do a lot for the students, and (2) the program has led to a closer relationship." (p. 64)	better relationships with teachers	improved school climate	School Climate
	"Students shared that the IB classes largely include only IB students; creating a separation between IB and non-IB students. As a result, IB students reported feeling isolated from non-IB students. One student shared that the IB program was insulated within the school." (p. 65)	feelings of isolation from core school culture	challenge to school climate	School Climate
	"Finally, students were asked how the IB implementation had created more opportunities to engage in school or community activities. The theme that emerged was that students and teachers share CAS opportunities with each other." (p. 66)	students become more involved in service activities	improved school climate	School Climate

Author	Text	Effect of the program	Code	Category
	"One district administrator noted that many of the teachers had not had sufficient training to teach in the IB program. 'For example, we had many teachers who either had not had training or who had not had training in quite some time. And many who had had a level one training, but had not gone beyond that.'" (p. 69)	difficulty maintaining trained staff	challenge to school climate	School Climate
	"Both school administrators mentioned the costs associated with the IB program as a challenge as well as the financial impact that it has on the student. One school administrator noted that cost is not just a perception. 'I think another challenge is the community perception that IB is an extremely expensive program. It is an expensive program. It's not just a perception.'" (p. 75)	heavy financial cost to districts and schools	challenge to school climate	School Climate
	"The common challenges mentioned were the cost of IB and limited funding and the alignment of IB standards with the state standards." (p. 97)	difficulty with alignment to local curriculum	challenge to school climate	School Climate
	"Regarding benefits, the common themes were that IB provides a better education, IB provides a consistent program framework and common practice, and that IB creates international mindedness." (p. 97)	better quality education	positive academic outcome	Academic
	"Similar to this finding, the need for better balance between academic and personal/social life was the common theme in this study for how students have changed as learners. Students specifically mentioned that they were not able to care for themselves such as getting enough sleep due to their heavy workload." (p. 99)	sacrifice of social life	negative non-academic outcome	Non-Academic
		sacrifice of sleep	negative non-academic outcome	Non-Academic
	"The teachers responded with pretty much the same response: "Time." One teacher elaborated a little more and stated that time is definitely a resource that is of issue ..." (p. 51)	lack of time for proper implementation	challenge to school climate	School Climate
Caspary, Woodworth, Keating, Sands, 2015	"Low-income Diploma candidates who enrolled at 4-year colleges and universities had 6-year graduation rates that were similar to the national average for all students, higher than the national average for low-income students, but lower than those of higher-income Diploma candidates" (p. vi)	higher college graduation rates for low-income students	improved access	Access

Author	Text	Effect of the program	Code	Category
	"The IB Diploma Programme grew rapidly from 2008 to 2014, with increases in both the absolute number of course students and Diploma candidates and the percentage of low-income student in each group." (p. v)	increased access over time for low-income students	improved access	Access
DiGiorgio, 2010	"From the point of view of many students, the IB program allowed students who normally felt ostracized or restricted in regular classrooms the freedom to share their knowledge and interest freely with peers of similar ability. This safe environment also allowed for a high level of stimulation and engagement from students." (p. 284)	higher perception of school climate	improved school climate	School Climate
	"For some, being in IB limited their course choices as well as their social circles. The band teacher was discouraging students from entering IB if they wanted to be in the school band program" (pp. 284-285)	rigidity and lack of flexibility of the program	challenge to school climate	School Climate
		feelings of isolation from core school culture	challenge to school climate	School Climate
	"The study found that parents are the driving force behind students' decision to enroll in the program. Parents supported the program's installation from the beginning due to their perception that there had not been comparable attention paid to their children's need for more engagement and stimulation in school, as well as desiring a more rigorous and respected preparation pro- gram for university." (p. 283) "Parents who were knowledgeable about IB or knew how to get more information had social, economic, and cultural capital themselves. They wanted their children to access this program so that they would be able to continue gaining capital. Parents also felt safe knowing that their children were interacting with other students whose parents had raised them in a similar manner." (p. 284)	creation of parental pressure to access the program	negative non-academic outcome	Non-Academic
		homogeneous grouping of students created (desired by parents)	positive non-academic outcome	Non-Academic

Author	Text	Effect of the program	Code	Category
Shah, Dean, Chen, 2010	"The enrollment rates of IB students at UC campuses show that IB students tend to enroll at the most competitive schools within the system and are likely to be experiencing more challenging coursework." (p. 4) "Though students in the comparison group possessed similar academic credentials to IB students, they tended to enroll at the more competitive schools in the UC system at slightly lower rates than IB students." (p. 4)	increased choice and enrolment in more competitive colleges	improved college outcome	College
	"After their first year of graduation, students from IB programs earned higher grade point averages than did students in the comparison group and students in the UC population overall. This pattern held across all three cohorts. T-tests showed that the differences in the mean GPAs of IB students and the comparison group were statistically significant for all three cohorts in the first year, and for the 2000 and 2002 cohorts at graduation." (p. 4)	increased college performance	improved college outcome	College
	"IB students in the UC system had consistently higher graduation rates than comparison group students; graduation rates among IB students ranged from 1 to 11 percentage points higher than the comparison group. Results of the chi-square showed statistically significant differences for the 2000 and 2002 cohort of IB students." (p. 5)	increased college graduation	improved college outcome	College
Verneuille, 2011	"Another interviewee expressed his reservations about the level of pressure that students in the IB program experience. He explained that many students in the program are under stress. The program delivers high level education that provides a great amount of preparation for college. But the difficulty of the program makes it strenuous for students especially in their junior and senior years. He emphasized a need for family support as well as assistance from the school." (p. 36)	increased stress	negative non-academic outcome	Non-Academic
		greater perceived level of difficulty	negative academic outcome	Academic

Author	Text	Effect of the program	Code	Category
	" 'The Board wanted as much of a guarantee as possible that when our kids graduate from high school that they are going to be doing fine in whatever college they choose or whatever path they choose. Be life long learner. Transition well to college. For the most part it has become a reality. Seventy five to eighty percent of our kids are taking college courses. Sixty-eight to seventy percent are taking three or more college courses. We have seen a total change in the culture of the school. We are a school that takes learning seriously.' " (p. 31)	improved school culture	improved school climate	School Climate
	"As compared to the teaching of AP classes where teachers work largely in isolation, in the IB program the 'teacher need to work in concert with each other forcing a professional learning community to take place.'"(p. 37)	increased collaboration among teachers	improved school climate	School Climate
	"'The problem is that everything tends to happen at the same time, and the stress level, these kids could end up working until three or four in the morning, like, several nights in a row. And the parents, I have had a lot of parents come in to talk about this. What I have told them that what we tried to do is coordinate…we promised coordination, and frankly, I am getting pushback from the teachers on this. It is very difficult. Think about it. We have a bunch of teachers. They are all seasoned. They are teaching brand new courses for the first time. They are in the spotlight and everybody is watching them. Whatever grades they give are going to be published all through the district.'" (p.38)	increased stress for teachers	challenge to school climate	School Climate
	"More than one interviewee spoke of the students who participated in the IB program as being better prepared to graduate from college in four years than others." (p. 43)	increased feelings of academic readiness for college	improved college outcome	College
O'Connor, 2011	"As Figure 3 indicates, at the same time that this strategy helped hold resident enrollments steady—keeping them from dropping further off, as projected—efforts to draw non-resident students made the actual enrollments trend significantly upward, which had the desired effect of taking future funding streams from eminent shortfalls towards solvency and surplus." (p. 77)	increased enrolment in the school	improved school climate	School Climate

Author	Text	Effect of the program	Code	Category
	"Additionally, because the externally assessed courses are responsible for recruiting, the general education classes not only get bigger, they might also get less attention when taught by an IB teacher. This possibility was evidenced by an IB teacher who teaches one section of general history. She noted that if she ―didn't teach the IB course, [she] would probably be having [her] general kids write more. The time needed to deliver the results for her IB classes dominated her preparation and practice, and her acknowledgement pointed to a potential cost to the general education students." (p. 93)	creation of large general education classes	challenge to school climate	School Climate
		teachers' time unevenly distributed between IB demands and regular class demands	challenge to school climate	School Climate
	"'As they discussed the virtues of their IB professional development experiences, those who taught non-IB courses provided specific examples of how that training impacted the teaching and learning process in both courses. An English teacher noted how she could not help sharing her newly developed skills after ―seeing all these different kinds of kids find success with it, or enjoyment out of it. And it was a great inspiration for figuring out ways to bring it into my [general] tenth grade class at the time.'" (p. 106)	improved teaching in general education classes due to increased teacher training	improved school climate	School Climate
	"Partly the result of supply and demand, securing an advanced teaching assignment was difficult to attain, and the competition was not always collegial. According to a veteran IB teacher, part of the problem was how the appearance of inequity was substantiated and sustained by trends in teacher placement and promotion." (p. 107)	inequity amongst teaching assignments	challenge to school climate	School Climate
Austin-King, Lee, Little, Nathan, 2012	"The number of students in all racial groups who took IB exams experienced significant increases between FY 2006 and FY 2011. The number of White students increased the least, by 83%." (p. 22)	increased access over time for minority students	improved access	Access
	"The total number of IB exam takers, both low-income and middle- and high-income students, increased significantly between FY 2006 and FY 2011. However, the number of low-income IB students increased at a far higher rate than middle- and high-income students. The number of low-income students increased by 150%, while the number of middle- and high-income students increased by only 55%." (p. 33)	increased access over time for low-income students	improved access	Access

Author	Text	Effect of the program	Code	Category
Jarva, 2013	A student on why people were dropping out of the IB DP: " 'That was probably the biggest one. For some, it was about the elective courses. Not being able to take band, choir, or a specific art class because they didn't fall under 'IB' was tough. Electives did away with a few people, but the majority of people, it was too hard. It was really about the workload; and not necessarily that they couldn't handle the workload but that they weren't sold on what the workload was for…if there was really an end goal. They weren't really sold that it was worth it, not that they couldn't handle it per se but you know if they would be better off or not necessarily better off but that they would rather instead if chasing something that they weren't really familiar with they would rather do something else.' (Will)" (pp. 62, 63)	increased workload	negative academic outcome	Academic
		rigidity and lack of flexibility of the program	challenge to school climate	School Climate
	" '…and our parents were frustrated with the level of stress that we struggled to balance.'" (p. 63)	increased stress	negative non-academic outcome	Non-Academic
	" 'I think it definitely prepared me for college. I felt like the quality of work that was demanded of me was the same but instead of being at school from 7 to 3 and then going to sports 3 to 6 and then work from 6 to 10 and then doing my homework after that, I had a class for an hour and then had a whole day to just relax…'" (p. 63)	increased feelings of academic readiness for college	improved college outcome	College
	"The stories of three of the other graduates of the first IB cohort at Meadow Brook revealed more of this pattern of learning how to learn." (p. 65)	better quality education	positive academic outcome	Academic
Aulls, Lemay, Pelaez, 2013	"Further analysis of the students' reports of ways that that participation in the EE had aided them in meeting the demands of academic work in their first year courses demonstrated that most of the knowledge learned through EE participation served them to successfully cope with these academic demands." (p. 5)	increased feelings of academic readiness for college (due to the extended essay)	improved college outcome	College

Author	Text	Effect of the program	Code	Category
	"Some students pointed out to us that really the IB DP environment afforded conditions that are more likely to promote students' learning of inquiry skills and participation in inquiry than the first year of university offered them. Indeed their observations are completely in agreement with the research literature on the teaching and research nexus reported earlier in the literature review (Healey, 2005)." (p. 35)	improved learning environment	positive academic outcome	Academic
Inkelas, Swan, Pretlow, Jones, 2013	"When discussing their Extended Essay experiences, as well as their research experiences in college, all participants shared that the Extended Essay played a critical role in familiarizing them with the systematic process of research, which they found valuable to university preparation. With regard to other curricular aims of the Extended Essay, the skills that students said they most often used in college fell under the category of critical thinking and communication skills." (p. 26)	increased feelings of academic readiness for college (due to the extended essay)	improved college outcome	College
Halic, 2013	"Results show that when compared with national rates, DP graduates enroll, persist and graduate on time at higher rates." (p. 9)	increased college enrolment	improved college outcome	College
		increased college persistence	improved college outcome	College
		increased college graduation	improved college outcome	College
Cortes, Moussa, Weinstein, 2013	"As such, panel A of Table 3 reports the results for obtaining a B average or better overall. For the full sample of students, we observe in every column a positive and statistically significant effect of the program on the probability of earning a B average or higher in 11th grade coursework." (p. 292) "Panel B disaggregates the effect of the IB Diploma Programme on overall course performance by four subject-specific core courses: mathematics, English, social science, and science. Interestingly, most of the increase in the overall likelihood of earning at least a B stems from performance in mathematics coursework, which in 11th grade generally focuses on topics in advanced algebra and trigonometry." (p. 292)	increased academic performance (especially in math)	positive academic outcome	Academic

Author	Text	Effect of the program	Code	Category
	"…we find that the IB Diploma Programme decreased the probability of dropping out of high school by 2.6–2.9 percentage points. These point estimates imply substantially large program effects of 14–15 percent in the likelihood of dropping out of high school, relative to the mean of 19.1 percent. The coefficient estimates are larger in magnitude for black students, ranging from 3.8–4.6 percentage points depending on the specification. Given that almost one quarter (22.1 percent) of the black subsample dropped out of high school, the estimates represent large decreases of 17–21 percent in the probability of dropping out of high school for these at-risk youths." (p. 294)	decreased high school drop out rates (especially for African American students)	improved access	Access
	"The IB Diploma Programme also led to a dramatic improvement in high school graduation, with an increase of 3.9–4.1 percentage points in the probability of graduation, a five percent increase over the mean graduation rate of 76.4 percent. Nearly all of this increase can be attributed to the black student subsample; specifically, the proportion of black students who graduated from high school increased by 5.3–6.2 percentage points, a 7–8 percent improvement from a base graduation rate of 73.8 percent. For Hispanic students, on the other hand, the coefficient estimates remain positive but are approximately half the magnitude of the corresponding estimates for the full sample and are always insignificant." (p. 294)	increased high school graduation rates (especially for African American students)	improved access	Access
Conley, McGaughy, Davis-Molin, Farkas, Fukuda, 2014	"On average, IB/Honors students scored higher on the UO math placement test than their Non-IB/Honors peers." (p. 11)	increased performance in math	positive academic outcome	Academic
	"A greater proportion of IB/Honors students persisted through college in comparison to Non-IB/Honors students." (p. 12)	increased college persistence	improved college outcome	College

Author	Text	Effect of the program	Code	Category
	"Qualitative data from the design charettes suggest that students who participate in the IB Diploma Programme during high school are more academically adjusted to the rigor and expectations of college courses." (p. 15) "Follow-up questions revealed reasons for the differences in adjustment self-ratings: • The IB/Honors students' responses suggest they were not intimidated by the heavy workload required in college honors courses. The IB Diploma Programme had taught them how to balance coursework and manage their time. • The IB/Honors students had experience with the pressure of an end-of- course IB exam and, therefore, were prepared for an exam-based grading structure in college. • The Non-IB/Honors students in the comparison group indicated that they felt less adept at managing their time or studying for culminating exams." (p. 15)	increased feelings of academic readiness for college	improved college outcome	College
Duarte, 2013	"Each interview subject reported that the perception of WHS within the community was positively impacted by the existence of the IB DP on the campus." (p. 79) "The WHS focus group participants responded similarly to the question stating that the IB DP had had a positive impact on the school's reputation." (p. 79) "One focus group participant stated that the IB DP had served to draw students from within the district to WHS." (p. 79)	improved school reputation/ increased enrolment	improved school climate	School Climate
	"…reported that the IB DP has 'raised the bar campuswide, especially when one considers how many Advanced Placement and honors level courses have been added separate from the IB program since it was implemented." (p. 81)	improved academics/increased expectations for all students in the school	improved school climate	School Climate
	"Respondents from WHS reported that for IB students timed writing had improved, and note-taking and critical thinking skills were enhanced…The IB teacher from WHS stated that the IB students were learning skills that would serve them beyond high school, such as research and writing." (pp. 83, 84)	better quality education	positive academic outcome	Academic

Author	Text	Effect of the program	Code	Category
	"However, as a result of training some department members receive at IB conferences, the Spanish teacher stated, 'We all now employ a thematic approach to teaching the students a foreign language." (p. 88)	increased collaboration among teachers	improved school climate	School Climate
	"She stated, 'There are some people here who are, like, oh, they are IB, you know everything goes to IB, or we aren't IB and so we don't get that." (p. 90)	disparity of resources	challenge to school climate	School Climate
	"All if the interview and focus group subjects believed that the workload (preparing, instructing, and assessing) was higher for the IB instructors than for college preparatory course instructors." (p, 92)	increased workload for teachers	challenge to school climate	School Climate
	"One LHS group member stated that the IB students are isolated on campus and do not interact with other students. Another LHS focus group member concurred, stating, "I think in IB, they pretty much stick to IB." (p. 97)	feelings of isolation from core school culture	challenge to school climate	School Climate
	"The LHS IB coordinator stated that colleges and universities give special consideration for admission to students who graduate with IB diplomas. The LHS principal noted that the distinction between IB participants and all other students becomes apparent around the time of college acceptances." (p. 98)	improved college acceptance/ admissions process	improved college outcome	College
	"A focus group member added that the IB students do not just work very hard, they are stressed – far more stressed even than AP students." (p. 101)	increased stress	negative non-academic outcome	Non-Academic
	"However, a WHS focus group member described her perception that 'IB kids see a sense of entitlement, as in 'bring a part of the IB program makes me deserve this and I am better than you are.'"" (p. 101)	increased entitlement	challenge to school climate	School Climate