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A Comparison Of The College Success Of International Baccalaureate Diploma Candidates And Course Candidates

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A COMPARISON OF THE COLLEGE SUCCESS OF INTERNATIONAL BACCALAUREATE DIPLOMA CANDIDATES AND COURSE CANDIDATES

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Dedication

To mom and Nana, for teaching me to value education and showing me that there's no time like the present to pursue your dreams.

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Abstract

The International Baccalaureate (IB) Diploma Programme is an international college-preparatory program that offers two levels of participation: IB diploma candidate and IB course candidate. The purpose of this study was to determine if there is a difference in college-related outcome achievement between these groups so that students and stakeholders can make informed decisions about their level of participation in the IB program. Quantitative data was collected and analyzed using statistical tests to compare the college acceptance, enrollment, retention, and graduation rates, as well as the time to college graduation, of IB diploma candidates and IB course candidates. There was a statistically significant difference between the groups on college acceptance rate, with IB course candidates having a higher acceptance rate. There was not a statistically significant difference between the groups on the other four outcomes. However, the outcomes of the IB students in the sample as a whole were high, indicating that the IB program leads to college success. It is recommended that students be encouraged to participate in the IB program, that students be allowed to choose their level of participation in the IB program, and that steps be taken to give students the skills necessary to enroll in IB classes. The results of this study inform all stakeholders, but they especially empower students to choose how they participate in the IB program not out of a perceived benefit when it comes to college, but based on what they want out of their high school experience.

A COMPARISON OF THE COLLEGE SUCCESS OF INTERNATIONAL BACCALAUREATE DIPLOMA CANDIDATES AND COURSE CANDIDATES

CHAPTER 1

INTRODUCTION

Background

The benefits of having a college degree are well known. People with bachelor's degrees are more likely to be employed than their peers with less education (Ma et al., 2019; Oreopoulos & Salvenes, 2011; Pew Research Center, 2014; U.S. Bureau of Labor Statistics, 2022), and they are also more likely to be employed full-time (Pew Research Center, 2014). They are less likely to be in poverty (Ma et al., 2019; Pew Research Center, 2014) because they earn more than those with a high school diploma or less (Akers, 2020; Dale & Krueger, 2014; Ma et al., 2019; Oreopoulos & Salvenes, 2011; Pew Research Center, 2014; U.S. Bureau of Labor Statistics, 2020, 2022). Students also develop skills in college, such as communication and analysis, which are some of the skills most valued by employers (Carnevale et al., 2013). In addition to employment and financial benefits, Cutler and Lleras-Muney (2010) found that those with more education are less likely to smoke, to drink heavily, and to be obese. Oreopoulous and Salvanes (2011) found that education improves a person's job satisfaction, patience, trust, and relationships. Because of these benefits, most adults believe that having a college education is important (Marken, 2019).

In order to reap the benefits of a college education, one must first be admitted into college, and college admissions is becoming more competitive. Consequently, students are applying to more colleges each year (Clinedinst, 2019; Kim et al., 2022). According to a study done by the Common App, not only has the average number of applications submitted per

applicant increased, but the number of applicants applying to more than 10 colleges has almost doubled since 2014 (Kim et al., 2022). Additionally, college is costly. Since the year 2000, the cost of college has risen faster than the cost of almost anything else (Akers, 2020). In that time, the cost of college has risen by an average of 7.1% per year, essentially doubling in price (Hanson, 2022). Because of its high cost, it is important for a student to have the skills necessary to successfully graduate from college, especially in a timely fashion, to avoid additional high tuition costs and reap the benefits of securing a college education.

One predictor of a student being successful in college is the rigor of their high school coursework. Rigor refers to courses that encourage students to think deeply about complex content. Acquiring college credits in high school is linked with college success (Watt et al., 2011). A rigorous program of high school study is correlated with college enrollment (Long et al., 2012); college GPA (Belfied & Crosta, 2012; Klopfenstein & Thomas, 2009); and college graduation (Adelman, 1999, 2006; Attewell & Domina, 2008). In his extensive landmark studies for the U.S. Department of Education, Adelman (1999, 2006) found that a rigorous program of high school study is the most important predictor of college graduation.

There are several options available for rigorous courses in high school, especially those that are designed to be college preparatory. The most popular in the United States is Advanced Placement (AP; Fazlul et al., 2021; Owen, 2023). Run by the College Board, AP offers more than 30 college-level courses to high school students in subjects such as English, U.S. History, and Psychology (Owen, 2023). In addition to giving students a chance to earn college credit in high school, many believe that taking AP courses helps with college acceptance, as well as graduation (Rodriquez et al., 2013). Another option for high school students to take rigorous coursework is Dual Enrollment. In this case, a high school partners with a local college, typically

a community college, to offer a Dual Enrollment course (Spencer & Maldonado, 2021). Dual Enrollment courses allow students to earn high school and college credit at the same time (Allen & Dadgar, 2012).

Another option for a rigorous high school course of study is the International Baccalaureate (IB) Diploma Programme (DP), which will henceforth be referred to as the IB program. The IB program, established in 1968, is an international college-preparatory program for high school juniors and seniors (International Baccalaureate Organization [IBO], n.d.). The IB program claims that it "prepares students…for success at university and life beyond" (IBO, 2012, para. 1). There are multiple research studies that support the claim that IB students are more successful in college than non-IB students in several different areas (Coca et al., 2011; Gordon et al., 2015; Pilchen et al., 2019). Not only are students who participated in the IB program more likely to enroll in college than students who did not (Coca et al., 2011; Gordon et al., 2015; Pilchen et al., 2019), but they are also more likely to graduate from college (Pilchen et al., 2019; Shah et al., 2010). IB students also are more likely to attend a selective college than non-IB students (Coca et al., 2011). They are more likely to have higher college GPAs (Geiser & Santelices, 2004; Shah et al., 2010). Colleges view the IB program as a rigorous one that prepares students for university study, increasing their chances of gaining admittance (Culross & Tarver, 2011; Dickson et al., 2018; Fitzgerald, 2017; Kyburg et al., 2007; Resnik, 2019). IB students also are likely to receive college credit for strong performance on their IB exams (Byrd et al., 2007; Hertberg-Davis & Callahan, 2008; Kyburg et al., 2007; Mayer, 2010; Poelzer & Feldhusen, 1997).

While these studies show that the IB program helps its students get into, do well in, and graduate from college, almost none of them differentiate between the two different levels of

participating in the IB program: pursuing the full IB diploma or taking individual IB courses. Students choosing the former option, IB diploma candidates, must take IB courses in all six IB subject areas as well as complete the IB core components, which include an extra course, a research paper, and community service. The other level of participation is to be an IB course candidate, which is a student who takes one or more IB courses, but is not pursuing the full IB diploma. In the United States, there is an even split between IB diploma candidates and IB course candidates (Pilchen et al., 2019). Since most of the research on college outcomes for IB students either groups IB diploma and course candidates together or leaves out course candidates completely, it raises several questions. Are full IB diploma candidates more successful than IB course candidates in college? Therefore, does taking on the additional work and stress to do the full IB diploma improve a student's chances of getting into, staying at, and graduating from college? Or will that student get the same results by taking IB courses?

Program Description

In this section, I describe the IB program as implemented at an independent school in a mid-Atlantic state, henceforth referred to by the pseudonym "Evergreen School."

Context

Evergreen School is an independent, college-preparatory high school in small city in a mid-Atlantic state with approximately 500 students in grades 8 through 12. The eighth grade is approximately 20 students, and the high school grades are approximately 120 students each. Demographically, the student body is 54% male and 46% female, 22% students of color, and includes a full range of socio-economic backgrounds (IB Coordinator, personal communication, 2020). Evergreen students come from a variety of public and independent middle schools. Nearly 100% of its graduates attend college. There are over 50 faculty members and over 30

administrators and support staff members at Evergreen School. Several of these employees are alumni of Evergreen School.

The IB program was implemented at Evergreen School in 1994 when the school was experiencing a period of low enrollment. A committee was convened to investigate programs that would make the school unique and more attractive to potential families; the IB program was chosen. Part of the reason was that several international businesses were coming to the area at the time, and the committee hoped that the IB program would attract those families to the school.

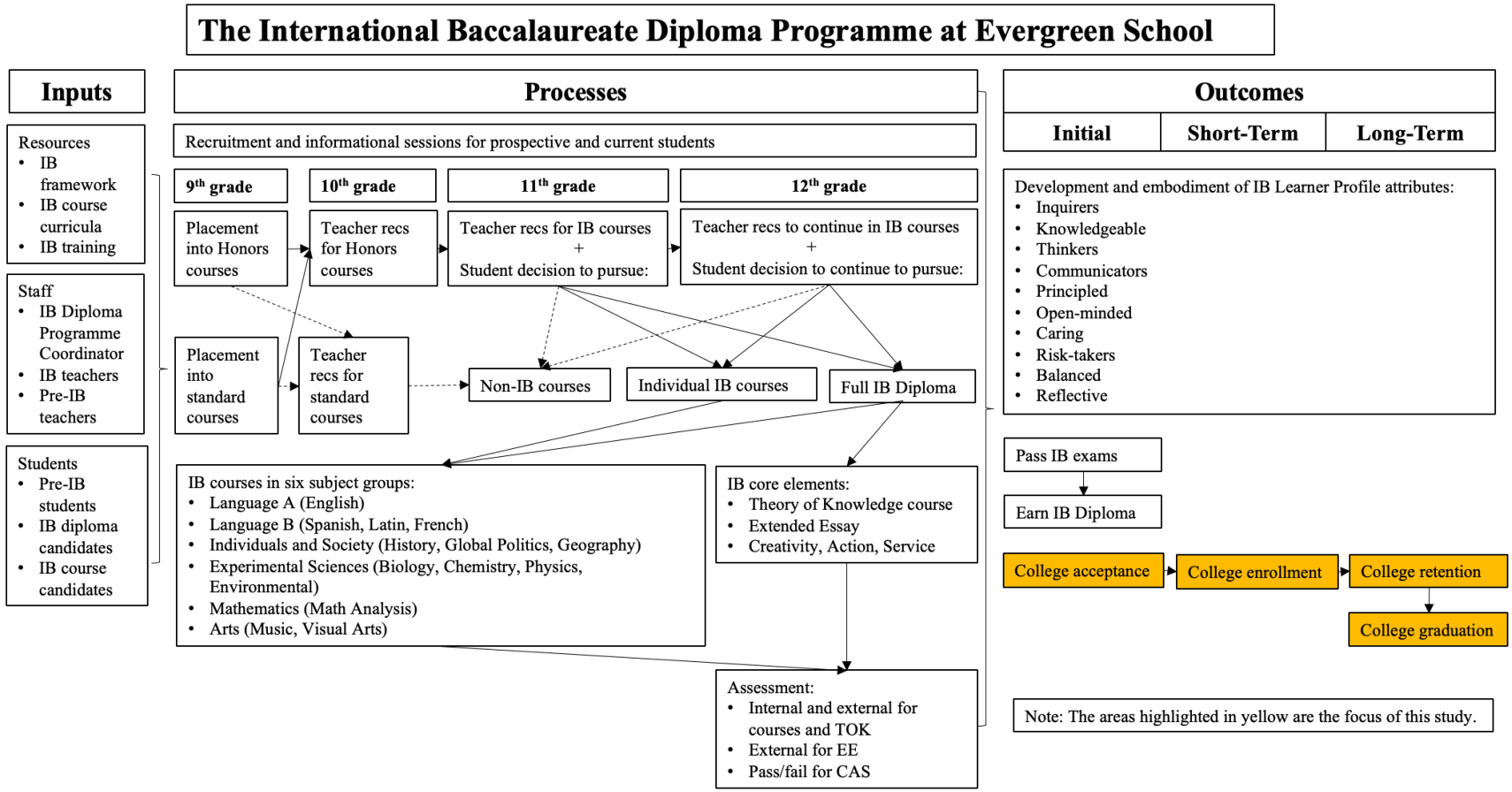
Although the reason behind the initial implementation of the IB program was to make the school unique, the reason behind its continued implementation is to support the school's mission. The mission is not included in full here to protect the school's anonymity. To paraphrase, the school's mission is to create a challenging academic environment in which students can discover who they are, what they are interested in, and become people of character. The IB program creates a challenging academic environment with its rigorous curriculum in six subject areas. The breadth of the IB program encourages students to develop themselves not only academically, but also in terms of critical thinking skills, art, community service, personal wellness, and international mindedness. The identity of Evergreen School is that it is an IB World School. Therefore, its policies and practices for all students are inspired by the IB philosophy.

Description of the Program

The IB program is a complex one with many components. The logic model, shown in Figure 1, focuses on the theory of action for students who participate in the IB program at Evergreen School. The four college-related outcomes, highlighted in yellow, were the focus of this study.

Figure 1

Logic Model



Note. IB = International Baccalaureate; TOK = Theory of Knowledge; EE = Extended Essay; CAS = Creativity, Activity, and Service

Inputs. Various inputs are needed to implement the IB program at Evergreen School. The resources needed include the IB framework, IB course curricula, and IB training. The staff needed include the IB Diploma Programme Coordinator (IB Coordinator), IB teachers, and pre-IB teachers. The three groups of students who comprise the IB program are pre-IB students, IB diploma candidates, and IB course candidates.

Resources: IB Framework. The IB DP framework, sometimes called the program model, consists of the major elements of the IB program, including its pedagogical approaches, intended outcomes, and program elements. One element of the framework is the Learner Profile, which are the 10 attributes the IB aims to instill in its students. Specifically, the IB program intends for its graduates to become: "inquirers, knowledgeable, thinkers, communicators, principled, open-minded, caring, risk-takers, balanced, and reflective" (IBO, 2015, p. 8).

The next element of the IB framework is Approaches to Teaching and Approaches to Learning. Approaches to Teaching are strategies for IB teachers to use to teach their content and develop the Learner Profile attributes in their students. They are: "based on inquiry, focused on conceptual understanding, developed in local and global contexts, focused on effective teamwork and collaboration, differentiated to meet the needs of all learners, and informed by assessment (formative and summative)" (IBO, 2015, pp. 66-7). Approaches to Learning are the skills students need to be successful in school and in life. They are "thinking skills, social skills, communication skills, self-management skills, and research skills" (IBO, 2015, p. 66).

The IB core components, which are the Theory of Knowledge course (TOK); the Extended Essay (EE); and Creativity, Activity, and Service (CAS), as well as IB courses are also part of the IB framework. These will be discussed in more detail later.

The final element of the IB framework is the central IB concept of international-mindedness. This term encapsulates the ideas in the IB mission statement, which is:

> 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, 2015, p. vi)

Resources: IB Course Curricula. There are six subject groups of IB courses. Group 1 involves a course in which the students study literature in their native language. Group 2 is the study of a second language. Group 3 contains social studies courses, such as history, global politics, and geography. Group 4 is science, Group 5 is math, and Group 6 is art, which also includes courses in theater and music. Students pursuing the full IB diploma must take one course from each of the six subjects, though students may elect to take a second course in Groups 1-5 instead of a Group 6 course. There are several courses available within each subject group. Each IB school chooses which courses to offer within each subject group based on their context. The courses offered at Evergreen School will be discussed later.

IB courses focus on critical thinking, synthesis, and application of concepts rather than memorization. Utilizing a constructivist approach to learning, the focus is also more on the student rather than the teacher. IB courses are offered at standard level (SL) and higher level (HL). HL courses require additional hours of seat time and cover more content than SL courses. Students also must demonstrate more depth of analysis on assessments. IB diploma candidates

must take three SL and three HL courses, although some students take two SL and four HL courses. Though some colleges will offer college credit based on scores on IB SL exams, more colleges will award college credit based on scores on IB HL classes (IBO, 2018). In other words, students can be relatively confident that they will earn college credit for a score of 4 or above on an HL exam, but they might not get credit for the same score on an SL exam.

Resources: IB Training. IB teachers are required to attend an IB training every 5 years as part of the IB accreditation process. Trainings are offered in-person as well as online. IB offers trainings on each of its courses, as well as on elements of the IB framework, such as Approaches to Teaching and Approaches to Learning. Additionally, there is training available for school administrators and the IB Coordinator.

Staff: IB Coordinator. The IB Coordinator is the full-time staff member in charge of administering the IB program. This involves collaborating with IB faculty, administration, and students; helping with the administration of the IB core components as well as the IB exams; recruiting and selecting students; and communicating with current and potential parents of IB students.

Staff: Teachers. Pre-IB teachers are those who teach ninth and 10th grade Honors classes. IB teachers are those who teach IB classes, including the teacher of the TOK course.

Students. Pre-IB students are ninth and 10th grade students enrolled in Honors classes. Some of these students have already expressed an intent to participate in the IB program when they reach the 11th grade. IB diploma candidates are the students who have chosen to undertake the full IB diploma. This includes six IB courses and the core components. IB course candidates are those who take individual IB courses. Most students in the school participate in the IB

program, whether as an IB diploma candidate or an IB course candidate. During the time of this study, 75% of the student body participated in the IB program.

Processes. The main processes that occur to implement the IB program at Evergreen School include Honors courses in ninth and 10th grade, and IB courses or the full IB diploma in 11th and 12th grade. The processes also include the core elements, assessments, and recruitment and information sessions for prospective and current students.

Ninth and 10th Grade. When students enter Evergreen School in the ninth grade, they are placed into standard level or Honors level courses. Students placed in Honors courses are considered pre-IB students since Honors courses are pre-requisites for IB courses. In the spring of freshman year, teachers make recommendations in the school's learning management system for whether students should continue at the Honors level in their subject or move to standard level courses for their sophomore year. If the students earn an Honors recommendation, they then choose whether they want to take Honors or standard level. Students wishing to be IB diploma candidates need to be in all Honors courses in their 10th-grade year. Students wishing to take individual IB courses need to be in the Honors course in the subject area in which they want to take the IB course.

11th and 12th Grade. In the spring of the sophomore year, teachers again make recommendations for what level students should be in for their junior year, and students again choose which level to take. Students wishing to be IB diploma candidates need to earn IB recommendations in all six subject groups. If a student only has recommendations in five of the six subject groups, the IB Coordinator can override the non-IB recommendation to give that student the opportunity to be an IB diploma candidate. Students wishing to take individual IB courses need to earn the recommendation in that subject group. In the spring of the junior year,

teachers yet again make recommendations about whether students should continue in their IB course(s) in their senior year. Again, students have the choice to continue to pursue the full IB diploma or individual IB courses or to drop down to Honors or standard level courses.

Individual IB Courses vs. Full IB Diploma Programme. In the 11th and/or 12th grade, students with teacher recommendations to do so can choose to take individual IB courses. Students who choose to pursue the full IB diploma make that choice officially in the spring of their 10th-grade year, so they are enrolled in IB courses in all six subject groups as well as the IB core components in their 11th-grade year. Some IB diploma candidates will choose not to continue the full diploma for their 12th-grade year and instead take individual IB courses. There is typically no more than a handful of students that choose not to continue in the IB program each year. When they do drop out of the program, they will typically choose to drop one or more of the core components. Occasionally, they will drop one of more of their IB classes. Anecdotally, there are many reasons a student might choose not to continue in the IB program, including stress, not having enough time to get work done due to having only one study hall, lack of interest, and competing commitments, such as sports teams.

IB Courses. See Table 1 for the IB courses offered at Evergreen School. It is worth noting here that Evergreen School also offers five AP courses: AP English, AP U.S. History, AP U.S. Government, AP Statistics, and AP Calculus. Prior to the time period of this study, the school offered more AP courses, many of which were taught as combined classes with IB courses. It was determined in 2014 that combining AP and IB classes was not a true implementation of the IB program. Therefore, the school decided to remedy this situation by offering only the AP classes whose curricula covered topics not covered in an IB course.

Table 1

International Baccalaureate Courses Offered at Evergreen School

Subject Group	Course	Level
Language A	English A: Literature	HL
Language B	French	SL, HL
	Latin	SL, HL
	Spanish	SL, HL
Individuals and Society	Geography	HL
	Global Politics	HL
	History: Europe	HL
Experimental Sciences	Chemistry	SL, HL
	Environmental Systems	SL
	Physics	SL, HL
	Biology	SL, HL
Mathematics	Math Analysis	SL
Arts	Music	SL, HL
	Visual Arts	HL

Note. SL = standard level; HL = higher level.

IB Core Components. IB diploma candidates must complete the IB core components to earn their IB diploma. As mentioned earlier, the IB core components are TOK, the EE, and CAS. TOK is a course on the nature of knowledge and the student as a knower. The course develops critical-thinking skills and encourages students to analyze their own perspectives. The EE is a

4,000-word independent research paper that gives students the opportunity to pursue in-depth an academic topic they are interested in. CAS encourages the students to develop themselves outside of the classroom through exercise, service, and creative activities. At Evergreen School, TOK is delivered during one class period that meets in the spring semester of the junior year and the fall semester of the senior year. The IB Coordinator holds monthly meetings before school and during the TOK class to guide the students through the EE and CAS, with much of the work being done on the students' own time.

Assessment. In IB courses, there are two different kinds of assessments, external and internal, which refers to who grades the assessment. External assessments are marked by IB examiners (i.e., they are graded by someone outside of the school). Internal assessments are marked by the classroom teacher (i.e., they are graded by someone within the school).

External assessments are the end-of-course exams that the students take in May. These exams are written by IB and graded by IB examiners using answer keys and rubrics created by IB. The exams consist of two or three parts depending on the course. Typically, the exams consist of short answer and essay questions focused on analysis and application of concepts.

Internal assessments give students the opportunity to explore an area of interest in that subject area. For example, in the IB sciences, students conduct their own experiments. In IB Latin, students research something they are interested in about the ancient world using ancient sources. The parameters and requirements for internal assessments are set by IB. IB also creates the rubric for the classroom teacher to use to assess the student products. The teacher assesses the student's work and sends their grade with an explanation of the grade to IB. IB then chooses a sample of student work from that teacher and essentially grades how the teacher graded the

internal assessment. If the teacher did not apply the rubric correctly, the grades for all of their students are adjusted accordingly.

The three core components are assessed slightly differently. Like IB courses, TOK has both an external and an internal assessment. However, its external assessment is an essay on a prompt created by the IB rather than an exam. The EE is assessed externally using an IB rubric. CAS is graded on a pass/fail basis based on student written reflections on their CAS activities.

Recruitment and Information Sessions. The IB Coordinator hosts several recruitment and information sessions throughout the year. When prospective families come to visit the school, part of their visit is a session with the IB Coordinator to learn about what the IB program is, its benefits, and requirements. An information session for 10th-grade students is held during the school day and for 10th-grade parents after school. Finally, all 10th-grade students who want to be IB diploma candidates meet with the IB Coordinator in the spring to plan what classes they are going to take for their 11th- and 12th-grade years.

Outcomes. The initial outcomes of the IB program are for students to pass their IB exams, earn the IB diploma, and be accepted into college. The short-term outcome is for them to enroll in college. The long-term outcomes are college retention and college graduation. An outcome that is initial, short-term, and long-term is for students to embody the attributes in the IB Learner profile.

Initial Outcome: Pass IB Exams. IB exams are graded on a scale of one to seven, with seven being the highest score. Though the IB does not state a specific passing grade, a score of a four is generally considered passing. Evergreen School students typically perform at or above the global average in most IB subjects.

Initial Outcome: Earn IB Diploma. In order to earn an IB diploma, students need to earn 24 points on their IB exams, with a minimum of nine of those points coming from their SL exams and twelve coming from their HL exams. They can earn up to three extra points toward their diploma from a combination of their scores in TOK and the EE. If they fail any of the three core components, they cannot earn their IB diploma. Traditionally, Evergreen School has a very high diploma pass rate. In fact, most years, 100% of its IB diploma candidates earn the IB diploma.

Initial Outcome: College Acceptance. One of the college-related outcomes of the IB program at Evergreen School is for its students to be accepted into college. Students believe that participating in the IB program will improve their chances of getting into college (Culross & Tarver, 2011; Dickson et al., 2018; Grose & Sanchez, 2021; Mayer, 2010). In fact, college acceptance is a main motivator for students choosing to participate in the IB program (Hertberg-Davis & Callahan, 2008). One of the purposes of this study was to investigate how true these perceptions are. Are IB diploma candidates accepted into college at higher rates than IB course candidates?

Short-Term Outcome: College Enrollment. The short-term outcome of the IB program at Evergreen School is for its students to enroll in college. Once students are accepted into college, they need to actually enroll in one of the colleges they were accepted into. In addition to college acceptance, this study looked at college enrollment rates of IB students. Do IB diploma candidates enroll in college at higher rates than IB course candidates?

Long-Term Outcome: College Retention. The first long-term outcome is for Evergreen's IB students to stay in college after enrolling. College retention rates were also investigated as

part of this study. Once they enroll in college, do IB diploma candidates have a higher college freshmen-to-sophomore retention rate than IB course candidates?

Long-Term Outcome: College Graduation. The second long-term outcome of the IB program is for its students to graduate from college. Graduation rates and time to graduation are the final outcomes that were evaluated as part of this study. Do IB diploma candidates graduate from college at higher rates than IB course candidates? Do they graduate from college faster than IB course candidates?

Initial, Short-Term, and Long-Term Outcome: IB Learner Profile. While the focus of this study is on the relationship between IB and college, it is important to remember that college success is not the only outcome of the IB program. The ultimate educational aim of the IB program is for its graduates to be "internationally minded," which means that they recognize "their common humanity and shared guardianship of the planet" and work to "create a better and more peaceful world" (IBO, 2015, p. 8). Through courses that are inquiry-based, conceptual, and collaborative, the IB program aims to develop attributes in its graduates which contribute to international mindedness both in high school, in college, as well as in life. These 10 attributes are captured in the IB Learner Profile (IBO, 2015). IB hopes that its graduates will be "inquirers, knowledgeable, thinkers, communicators, principled, open-minded, caring, risk-takers, balanced, and reflective" (IBO, 2015, p. 8). While college success is an intended outcome of the IB program, embodying the attributes in the Learner Profile is an outcome that lasts well beyond college and serves students in their careers and lives.

Overview of the Evaluation Approach

This evaluation was conducted within the pragmatic paradigm. Mertens and Wilson (2019) wrote that pragmatic evaluations "test the workability (effectiveness) of a line of action

(intervention) by collecting results (data collection) that provide a warrant for assertions (conclusions) about the line of action" (p. 86), which is exactly what this program evaluation did. It evaluated the outcomes (effectiveness) of the IB program (intervention) to legitimize and/or refine its implementation at Evergreen School (conclusions) through quantitative data (data collection). Because of its focus on outcome achievement and effectiveness, this evaluation was a product evaluation within the Context, Inputs, Processes, and Products (CIPP) evaluation model (Stufflebeam, 2003). The methodological assumption of the pragmatic paradigm is for the evaluator to choose "a method on the basis of what is right for a particular study in a particular context with a particular stakeholder group" (Mertens & Wilson, 2019, p. 87). So, while the pragmatic paradigm is typically associated with mixed methods, this study used quantitative methods because that is what is most useful for this evaluation.

Purpose of the Evaluation

The purpose of this evaluation was to determine if there is a difference in college-related outcome achievement between IB diploma candidates and IB course candidates. IB diploma candidates only have one study hall period while other students have two. This is because they are taking seven academic classes rather than the six that other students take. They also have the additional workload of taking six IB courses rather than just a few. Because of this, it has been my experience that IB diploma candidates are more stressed out than IB course candidates. IB students experience stress at higher rates than students not in the IB program (Suldo, O'Brennan, et al., 2018; Suldo & Shaunessy-Dedrick, 2013a, 2013b; Suldo et al., 2008). It has long been the assumption of many in the school community that being an IB diploma candidate improves college success outcomes more than being an IB course candidate. However, there is almost no evidence to support that claim. It is important for all stakeholders to know whether the extra

work and stress of pursuing the full IB diploma is worth it when it comes to college success outcomes. Are students choosing to take on the additional work and stress of the full IB diploma when they would have the same outcomes by only taking IB courses? Alternatively, are students limiting their chances of college success by choosing not to participate in the full IB diploma?

To find out if there is a difference in the college success of IB diploma candidates and IB course candidates, this study replicated and expanded upon a dissertation, *College Success Factors for International Students Studying in the United States of America After Completing an International Baccalaureate High School Program* (J. C. Hill, 2013). This study was then turned into an article entitled "Measuring College Success for International Baccalaureate Diploma and Certificate Candidates" (J. C. Hill, 2017). J. C. Hill compared various measures of college success of IB diploma candidates and IB course candidates from an independent school in South Korea. The measures that were examined were the rates of college acceptance, college enrollment, college retention, and college graduation, as well as time to college graduation. She found that, while IB diploma candidates had higher college enrollment rates, there was not a statistically significant difference between the two groups of students on any of the other college success factors.

There are several reasons J. C. Hill's study deserves replication. First, selection bias was not accounted for, which refers to the potential that IB diploma candidates already have naturally occurring characteristics that would predispose them to being more successful in college than IB course candidates. Second, this study was conducted early in the school's implementation of the IB program, so the college graduation data for only two graduating high school classes was able to be examined. Third, the study was conducted in the specific context of a high-achieving,

independent school in South Korea. The researcher herself even calls for this study to be replicated in different contexts to see if there is a difference in the findings.

The present study expanded upon J. C. Hill's study in several ways. First, selection bias was accounted for by using a matched sample based on unweighted high school GPA, to be discussed in Chapter 3. Second, the site for this study has been an IB school since 1994, so there are decades of college graduation data available to analyze. Third, the context of this study is different since it was conducted at an independent school in the United States.

This evaluation was formative in nature. The findings of this study are useful for determining whether to continue emphasizing the importance of participating in the full IB diploma or to encourage more students to simply take IB courses. Within the context of Evergreen School, the audience is the Head of School, the Head of the Academic Program, and the IB Coordinator. They are ultimately responsible for decisions made regarding the implementation of the IB program at the school. Beyond Evergreen School, the findings of this program evaluation are useful to all schools that offer both levels of participation in the IB program.

Focus of the Evaluation

This evaluation focused on the program outcomes related to college: college acceptance, enrollment, retention, graduation, and time to graduation. It examined if there is a difference in outcome achievement between IB diploma candidates and IB course candidates.

Evaluation Questions

This study replicated J. C. Hill's 2013 study comparing the college success factors of IB diploma candidates and IB course candidates, although the present study occurred in a different context and had access to distinct data sources. Depending on what range of years is relevant to

answer each question, the data came from the high school graduating classes of 2014-2022. The evaluation questions are:

1. To what extent do college acceptance rates differ between IB diploma candidates and IB course candidates?
2. To what extent do college enrollment rates differ between IB diploma candidates and IB course candidates…
    a. in the fall immediately after high school graduation?
    b. within the first year after high school graduation?
    c. within the second year after high school graduation?
3. To what extent do college freshman-to-sophomore retention rates differ between IB diploma candidates and IB course candidates?
4. To what extent do college graduation rates differ between IB diploma candidates and IB course candidates?
5. To what extent does time to college graduation differ between IB diploma candidates and IB course candidates?

Definitions of Terms

This section contains the definitions of several important key terms for this program evaluation.

College Retention. This refers to a student continuing to be enrolled in college from their freshman to their sophomore year.

IB Course Candidate. This is a student who takes at least one IB course, but is not pursuing the full IB diploma.

IB Diploma Candidate. This is a student pursuing the full IB diploma, which includes taking courses in all six IB content areas and completing the IB core components.

IB Student. This refers to a student that participates in the IB program, whether as an IB diploma candidate or an IB course candidate.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This chapter contains a review of the literature relevant to this program evaluation, which compares the college success outcomes of IB diploma candidates and IB course candidates. First is a discussion of the history and development of the International Baccalaureate and its programs. The next section contains criticisms of the IB program, which include that it is too focused on the United States, expensive, and stressful. Following that is a discussion of the benefits of the IB program, with a focus on college-related benefits. Qualitative findings are presented first, followed by quantitative findings. J. C. Hill (2013), the study I in large part replicated, is summarized. This literature review will conclude with a discussion of the gaps in the literature that this study aims to fill.

History of IB

This section provides a summary of the history of the IB program, including its origins, further development, and spread around the world, especially in North America.

Origins

The IB originated in 1968 at the International School of Geneva, commonly referred to as Ecolint (I. Hill & Saxton, 2014; Peterson, 2011). Ecolint was founded to serve the children of the employees of the League of Nations (Peterson, 2011). The school had a vision for an international education that encouraged its students to recognize and value the perspectives of others, as well as to work together for the betterment of the world (I. Hill & Saxton, 2014). Because its students planned to attend college in countries throughout the world, Ecolint had a

challenge in preparing its students for the university entrance requirements of different countries (Bunnell, 2008; I. Hill & Saxton, 2014; Nugent & Karnes, 2002; Peterson, 2011). By combining their ambitious vision and the practical need for a universal international education, the IB program was born.

It was the teachers from Ecolint who conceptualized the IB program (Peterson, 2011). Some notable contributors included the head of school, Desmond Cole-Baker, and the head of the history department, Bob Leach (Bunnell, 2008; IBO, 2017). Eventually, the project of developing the IB program became too big for the school to handle on its own, so an organization called International School Examination Syndicate was established in 1964 (Bunnell, 2008; Peterson, 2011). People such as John Goormaghtigh, the Belgian director of the Carnegie Endowment for World Peace, and Harlan Hanson, director of the AP program, joined the development team (Peterson, 2011).

Once outside funding was received from the Twentieth Century Fund and the Ford Foundation, the IB program started to gain more steam and the first IB office was opened in Geneva (Nugent & Karnes, 2002; Peterson, 2011). Alec Peterson became the first Director General of the IB (IBO, 2017). Gerard Renaud presented the basic curricular framework for IB at a conference in 1965 (Peterson, 2011). This framework of students taking six courses from six different subject groups survives in IB to this day. At another conference later that year, French representatives added the mandatory Theory of Knowledge course to the IB curriculum (Peterson, 2011). At a conference in 1966, the idea of students being able to earn certificates for courses if they are not able to complete the full IB program was adopted (Peterson, 2011). CAS was added to the curriculum in 1968, followed by the EE in 1974 (IBO, 2017).

All of the universities in France and Sweden agreed to recognize the IB program for university admittance, as did more than a dozen in England and several in America and Switzerland. In 1970, the first group of IB students gained admittance to college using their performance in the IB program (Peterson, 2011).

Development

There is little literature on the development of the IB program after its origins (Bunnell, 2008). By the year 1982, 100 schools offered the IB DP; more than half of these schools were located in Europe (Bunnell, 2008). In 1994, the number of schools offering the IB DP grew to over 500, then over 1000 in 2002 (Bunnell, 2008). IB began to grow exponentially in the 2000s, with there being 2,000 IB schools in 2008, then 3,000 by 2010, and 4,000 by 2014 (IBO, 2017). Today, IB is offered in 159 countries in more than 5,600 schools (IBO, 2023).

As the IB program spread, regional groups were established. In 1975, International Baccalaureate North America was established since the program was growing so much in that area, particularly in the United States (Peterson, 2011). In the late 1980s, International Baccalaureate Asia Pacific and International Baccalaureate Africa, Europe, and the Middle East were established (Peterson, 2011). Currently, the IB has regional offices in Geneva, The Hague, Cardiff, Washington D.C., and Singapore (IBO, 2017).

Although the main IB program is the IB DP, the IB offers three other programs: the Middle Years Programme, the Primary Years Programme, and the Career-Related Programme. In 1980, attendees at a conference of international schools recommended that a pre-IB program be created for 11-16-year-old students (IBO, 2017). The IB took on this project and established the Middle Years Programme in 1994 (IBO, 2017). Similarly, the idea of a pre-IB program for 3-12-year-old students was discussed at a conference in 1990, which led to the introduction of the

Primary Years Programme in 1996 (Bunnell, 2008; IBO, 2017; Nugent & Karnes, 2002). The IB's newest program, the Career-Related Programme, was established in 2012 after approximately a decade of developing and pilot-testing (IBO, 2017). This program was born out of the desire to provide an IB education to students planning to go into careers after high school rather than college (IBO, 2017). Additionally, the IB mission statement was developed in 1998, followed by the learner profile in 2006 (IBO, 2017).

Spread in North America

Although the IB program has grown throughout the world, it has seen the most growth in North America, particularly in the United States (Bunnell, 2008, 2011). In 2008, almost half of schools offering the IB DP as well as 60% of schools offering IB Middle Years Programme were located in North America (Bunnell, 2008). Currently, the numbers are similar, with 46% of IB schools being located in North America (IBO, 2023). Although elsewhere in the world IB is more often found in independent schools, in the United States, IB is far more popular in public schools (Bunnell, 2011). The United States has 5 times more IB schools than any other country (Bunnell, 2008). California, Florida, New York, Texas, and Virginia account for 40% of IB students in the United States (Bunnell, 2011). This disproportionality leads to some of the criticisms of the IB: is it really international if it is so heavily populated by students from the United States?

Criticisms of IB

This section presents several criticisms of the IB program, which include that it is not truly international, that it is expensive and excludes certain students, and that it is stressful for students who choose to participate in it.

Not Actually the "International" Baccalaureate

A long-standing criticism of the IB is that it is Eurocentric (Bunnell, 2008, 2011; Peterson, 2011), though it could be argued that now its focus is on North America (Bunnell, 2011). Many of the IB trainings, which are required for a school to be an accredited IB school, are located in Europe and the United States (Bunnell, 2008, 2011). This makes it challenging for teachers from other countries to attend both in terms of time and costs; this is especially true for teachers from developing countries (Bunnell, 2008, 2011). Of the 54 countries in Africa, almost half of them do not have any schools offering IB, and 12 of these countries only have one IB school (Bunnell, 2008). In fact, just the state of Virginia in the United States has more schools offering IB than all of the Africa and the Gulf Region combined (Bunnell, 2011).

This disparity continues in relation to curriculum and assessment. For IB History HL, schools choose whether to study Europe, the Americas, Asia, or Africa. In 2005, more than 60% of students worldwide took the History of the Americas exam, while fewer than 1% took History of Africa (Bunnell, 2011). Additionally, IB is offered in English, Spanish, and French. Most schools offer it in English, and the number of schools offering the program in French is declining so much it may have to be phased out (Bunnell, 2011).

The IB program has grown so much in the United States that there is a concern that some countries view it as an American product; some countries might not want to adopt IB for political reasons because of its association with the United States (Bunnell, 2011). Bunnell (2011) writes that "the growth in the United States is beginning to overshadow, and even undermine, the notion of a globally branded and unified IB World" (p. 69).

Lack of Access

The requirements to have an IB program are significant. Schools cannot offer individual IB courses and instead must offer the entire IB program (Byrd et al., 2007). This means offering courses in six subject areas, delivering the three core components, having an administrator in charge of the program, and going through a review process every 5 years. Additionally, the financial costs of having an IB program are significant. In addition to an annual fee of almost $12,000, the school must pay a fee every 5 years when it undergoes evaluation to maintain its status as an IB world school (IBO, 2022). The school must have an administrator to run the program, which requires paying an additional salary and benefits. Teachers must be trained every 5 years, which costs thousands of dollars in fees and travel expenses. Some schools and school districts do not have the manpower or financial resources to offer the IB program. This causes some schools and school districts to opt for cheaper programs with less complicated requirements, such as AP (Bunnell, 2011; Culross & Tarver, 2011). There are also concerns about public education funds being used for a program like IB that only benefits some students, and that this is done at the expense of other students (Fitzgerald, 2017).

When a school or school district cannot offer the IB program because of lack of resources to meet IB program requirements, this limits the access of its students to a rigorous course of study that leads to college success (Culross & Tarver, 2011). Even in schools that are able to offer IB programs, the typical student who enrolls in the IB program is one from a "more advantaged background" (Perna et al., 2015, p. 419). Students who participate in the IB program tend to have parents who went to college (Bailey & Karp, 2003; Chen et al., 2010), as well as families with higher incomes (Chen et al., 2010; Shah et al., 2010). Students of color and students from low-income backgrounds are often underrepresented in IB programs (Gordon et

al., 2015; Hertberg-Davis & Callahan, 2008; Mayer, 2008; Perna et al., 2015; Pilchen et al., 2019; Shah et al., 2010). Some of these underrepresented students report feeling that the IB curriculum does not fit their needs (Hertberg-Davis et al., 2006; Kyburg et al., 2007) and that they do not feel like they belong in the IB program (Hertberg-Davis & Callahan, 2008). Perhaps this is a contributing factor to the fact that students of color and low-income students are much less likely to earn the IB diploma (Pilchen et al., 2019).

Stress

In addition to its demanding requirements and equity issues, the IB program has a reputation for being stressful. Students in IB programs are significantly more stressed than students in standard level classes (Suldo, O'Brennan, et al., 2018; Suldo & Shaunessy-Dedrick, 2013a, 2013b; Suldo et al., 2008). They report feeling overwhelmed by the workload required in their advanced IB classes (Foust et al., 2008, 2009; Hertberg-Davis et al., 2006; Hertberg-Davis & Callahan, 2008; Mathews & I. Hill, 2005; Suldo, Shaunessy-Dedrick, et al., 2018; Taylor & Porath, 2006). In order to earn their IB diploma, students must take IB courses in six subject areas, as well as complete the additional IB core components (IBO, 2012). Since IB is a college-preparatory program, the coursework challenges students and often requires a lot of studying and work outside of class. This can lead to students feeling overwhelmed and burned out. Often, students have multiple assignments due at the same time, which causes stress (Kyburg et al., 2007). Additionally, high achieving students tend to over-program themselves by being involved in numerous activities outside of school (Mathews & I. Hill, 2005). In order to get their work done and have a social life, IB students sacrifice sleep, which only causes them to be more stressed (Foust et al., 2008, 2009; Hertberg-Davis & Callahan, 2008).

Benefits of IB

Despite these criticisms of the IB program, there are many more benefits. These include its high academic standards as well as many college success outcomes.

High Academic Standards

IB is chosen for adoption in high school for several reasons. One is that some schools feel that the IB program is more rigorous than AP courses (Bunnell, 2008). Another is that the IB program is seen to raise the academic bar (Byrd et al., 2007; Daniel & Cox, 1992; Spahn, 2001). In the United States, many underperforming high schools choose to adopt the IB program to increase achievement in their schools (Kyburg et al., 2007; Mayer, 2008). Many high schools that adopt the IB program have the perception that it develops greater academic and social skills in its students than other advanced high school programs (Fitzgerald, 2017). High schools believe that the IB program prepares its students for college (Grose & Sanchez, 2021).

College Success

IB claims that it "prepares students…for success at university and life beyond" (IBO, 2012). Overall, studies support IB's claim that it prepares students for college success. First, a synthesis of qualitative findings is presented, followed by a more in-depth analysis and critique of the quantitative findings.

Qualitative Measures. The majority of studies focused on the IB and college use qualitative methodologies, with a particular focus on perceptions of the IB program (Dickson et al., 2018). Below is a synthesis of the findings of those studies, which include the skills developed in the IB program, college perceptions of the IB program, and student perceptions of the IB program.

Skills. IB Learner Profile skills overlap with the 21st-century skills desired by colleges and employers, such as communication and self-reflection skills (I. Hill & Saxton, 2014). While Culross and Tarver (2011) found that IB students were neutral on whether the IB program helped with their time management skills, many other studies found that IB students felt that the IB program made them better at time management (Coca et al., 2011; Conley et al., 2014; Dickson et al., 2018; Hertberg-Davis & Callahan, 2008; Lee et al., 2014).

Larson and Kurtyka (2017) interviewed IB graduates in college to determine the extent to which they felt their participation in the IB program developed the skills outlined in the Framework for Success in Postsecondary Writing. The students reported that they felt IB developed them into people who are open to other ideas and perspectives, as well as people who are self-reflective. These IB graduates also felt that IB developed their ability to be flexible, curious, and engaged. Culross and Tarver (2011) obtained similar results from their interviews with current IB students and IB graduates. These participants reported that they felt their skills in writing, studying, communicating, critical thinking, and creativity all improved as a result of the IB program. Lee et al. (2014) also found that students felt that their study skills developed as a result of the IB program.

College Perceptions. Colleges view the IB program as a rigorous one that prepares students for university study (Culross & Tarver, 2011; Dickson et al., 2018; Fitzgerald, 2017; Kyburg et al., 2007; Resnik, 2019). In studies conducted in several different countries, researchers found that university admissions personnel viewed the IB program positively (Coates et al., 2007; Jenkins, 2003; Fitzgerald, 2017). Fitzgerald (2017) reported that college admissions personnel perceive that the IB program prepares students better for college than other advanced high school curricula. Because of the perception that IB students perform well in college,

colleges are interested in accepting them (Culross & Tarver, 2011; I. Hill & Saxton, 2014). Many colleges offer college credit for high scores on IB exams as well as scholarships to attract IB students to their college (I. Hill & Saxton, 2014).

Student Perceptions. Several themes emerged from the literature regarding student perceptions about IB and college. Students perceive that participating in the IB program improves their chances of being accepted into college (Culross & Tarver, 2011; Dickson et al., 2018; Grose & Sanchez, 2021; Mayer, 2010). Additionally, students believe that participating in the IB program improves their chances of being accepted into a prestigious college (Culross & Tarver, 2011; Hertberg-Davis et al., 2006; Mayer 2010). In their interviews with IB students, Hertberg-Davis and Callahan (2008) found that students felt that the IB program was "crucial" to being accepted into a prestigious college (p. 207). They also found that acceptance into a prestigious college was the main motivating factor for students electing to participate in the IB program. Another motivating factor for students choosing to participate in the IB program is the perception that they will earn college credit from taking IB courses (Hertberg-Davis et al., 2006; Mayer 2010). Mayer (2010) reports that students can in fact earn a year of college credit for earning the IB diploma at more than 100 colleges in the United States.

Many studies found that students believe that the IB program prepares its students for college (Coca et al., 2011; Conley et al., 2014; Culross & Tarver, 2011; Grose & Sanchez, 2021; Hertberg-Davis & Callahan, 2008; Lee et al., 2014; Taylor & Porath, 2006). They also believe that the college preparation they received from participating in the IB program will lead them to succeed in college (Coca et al., 2011; Dickson et al., 2018; Mayer, 2010). Conley et al. (2014) found that IB graduates currently in college feel that their participation in the IB program

contributed to their college success. Overall, students value their participation in the IB program (Conley et al, 2014; Grose & Sanchez, 2021).

Quantitative Measures. Most of the research on IB, whether qualitative, quantitative, or mixed methods, is on perceptions of the IB program (Dickson et al., 2018). Based upon my review of literature available on the IB research website and through a search of common comprehensive research databases available through the College of William & Mary's library system, there have only been five scholarly studies on the outcomes of IB students in college in the United States using quantitative data in the last thirteen years. First, I will present a brief synthesis of the findings of these studies. Then, I will summarize and critique each one individually, which will be followed by a discussion of the dissertation this study is replicating.

Not only are students who participated in the IB program more likely to be accepted to college (Kyburg et al., 2007), but they are more likely to enroll in college (Coca et al., 2011; Gordon et al., 2015; Pilchen et al., 2019); stay in college (Coca et al., 2011; Conley et al., 2014; Pilchen et al., 2019; Resnik, 2019); and graduate from college (Pilchen et al., 2019; Shah et al., 2010). Further, IB diploma candidates are more likely to graduate from college than IB course candidates (Pilchen et al., 2019; Shah et al., 2010). IB students are also more likely to attend a selective college than non-IB students (Coca et al., 2011; Pilchen et al., 2019; Sanders & Ishikura, 2018; Shah et al., 2010). They are also more likely to have higher college GPAs (Shah et al., 2010).

Shah et al. (2010). Shah et al. (2010) is one of the few large-scale studies of outcomes of IB students in college. The participants were students from the eight colleges in the University of California system between 2000 and 2002. This sample included over 1,500 IB students and over 5,000 non-IB students. One of the strengths of the methodology is that the researchers controlled

for selection bias by creating a matched sample of non-IB students to IB students using year of college enrollment, race/ethnicity, family income, and high school academic performance. They found that IB students were more likely to enroll in one of the three most competitive schools in the University of California system than they were to enroll in the less competitive colleges. They did not provide this data for non-IB students.

The researchers looked at the college GPA of IB students and non-IB students after their first year of college and upon college graduation. They found that the IB students had higher college GPAs than non-IB students after their first year in college. The results of the t-test showed that this difference was statistically significant for all three graduating classes in the sample. They also found that, overall, IB students had higher college GPAs than non-IB students upon college graduation. The t-test did not show a statistically significant difference for the class of 2001, but it did for the classes of 2000 and 2002.

The other relevant research question of this study was the comparison of 4- and 6-year college graduation rates of IB and non-IB students. Overall, IB students graduated at higher rates than the comparison group of non-IB students. For the class of 2000, 56% of IB students graduated in 4 years compared to 45% of non-IB students in the comparison group. The difference is similar for the class of 2000 for the percentages of students in each group who graduated in 6 years, with 88% of IB students graduating in 6 years compared to 81% of the students in the comparison group. Again, the chi-square test did not show statistically significant differences in the graduations rates for the class of 2001, but it did for the classes of 2000 and 2002.

Shah et al. (2010) is of the few studies that differentiates between IB diploma candidates and course candidates. For the previously discussed research questions, it is unclear whether they

looked only at IB diploma candidates or at IB diploma candidates and course candidates combined. However, for their final research question, they did compare the graduation rates of IB diploma candidates and IB course candidates. They found that IB diploma candidates graduated at a higher rate than IB course candidates, meaning more IB diploma candidates graduated from college in 4 or 6 years than IB course candidates. However, a weakness of this study is that they did not appear to have run a chi-square test to determine whether this difference was statistically significant.

Coca et al. (2011). Coca et al. (2011) focused on the college success outcomes of students who participated in the IB program in Chicago Public Schools. Certain Chicago Public Schools offer the IB program and students must apply to attend those schools. Acceptance is competitive and is based on grades, standardized test scores, an essay, and an interview. The sample consisted of the almost 86,000 Chicago Public Schools students who graduated from high school between 2003 and 2009. To account for selection bias, the researchers created a matched sample of non-IB students based on standardized test scores, demographic characteristics, level of poverty in their neighborhood, and average education level in their neighborhood.

The researchers chose a confusing definition of "IB student" that does not agree with the official IB definition. According to IB, the IB DP is for 11th and 12th graders. The researchers analyzed these students and called them "IB DP students" (p. 8). They also chose to analyze a second group that they called the "IB cohort" (p. 8). This group was all of the students who were accepted into and attended an IB school from ninth grade on. These students took honors courses that were designed to prepare them for IB courses; however, this is not the IB program. The researchers did separate IB DP students from the IB cohort in their discussion, but the reader of this study must be careful to ensure they are looking at the results for what these researchers call

IB DP students to ensure they are looking at results of the official IB program. I will henceforth use the standard term of "IB students" instead of "IB DP students."

They found that IB students enroll in college at higher rates than non-IB students, with 77% of IB students enrolled in college compared to 53% of non-IB students in the comparison group. Additionally, IB students enrolled in selective colleges at higher rates. While 57% of IB students attended a selective college, only 38% of non-IB students did. Finally, they found that IB students' 2-year college retention rate was higher than non-IB students. They found that 80% of IB students persisted in college for 2 years compared to 71% of non-IB students.

Conley et al. (2014). Conley et al. (2014) is a mixed-methods study that examined the college readiness of IB students. The relevant qualitative findings have already been included earlier in this literature review, so here I will focus on the quantitative findings. The study was conducted using students from a college honors program between 2005 and 2012. Their sample included almost 200 IB students from the honors program and almost 1,500 non-IB students from the honors program. In this study, an IB student was defined as a student who had taken four or more IB classes. This means that the researchers did not differentiate between IB diploma candidates and course candidates; instead, they were grouped together as the sample. Another issue with this study is that the researchers claimed to have created a matched sample of non-IB to IB students, but it appears from their analysis that they included all of the non-IB students. They did include a table that showed that the gender and race/ethnicity demographics of both groups were very similar.

The researchers examined several indicators of the students' preparation for and success in college: performance on the college math placement test; GPA after 1 year of college, 2 years of college, and at college graduation; and persistence, which they defined as making adequate

progress toward their degree by earning 45 credits after 2 years of college, 90 credits after 3, and 135 after 4. They used simultaneous regression analyses, controlling for gender and minority status, to analyze the math placement test and GPA. They used a chi-square test for independence to analyze persistence.

Conley et al. (2014) found that IB students scored higher on the math placement test and that this correlation was statistically significant. They did not find a statistically significant correlation between GPA and the students' IB status. Instead, they found that race/ethnicity was predictive of first-year GPA, that gender was predictive of second-year GPA, and that race/ethnicity and gender were predictive of GPA upon graduation. Their final relevant quantitative finding was that IB students persisted in college at rates higher than non-IB students.

Their findings are significant because they compared IB students to non-IB students that were all enrolled in a highly selective honors program. Many studies about the IB program compare IB students to the general population, so when differences are found, it raises questions about selection bias. Since all of the students in this study distinguished themselves academically enough to be admitted into a college honors program, it makes the differences between the outcomes more significant.

Gordon et al. (2015). Gordon et al. (2015) focused on IB students in the United States who graduated from high school in 2013, with a focus on Title I schools. One of their research questions was to investigate the college enrollment trends of these students. They were able to obtain college enrollment records for 86% of IB diploma candidates and course candidates from the high school class of 2013 from the National Student Clearinghouse (NSC). They found that 82% of IB students in Title 1 schools, as well as IB students in all public schools, enrolled in

college. Of all US students, 66% enrolled in college. Therefore, the researchers determined that IB students enroll in college at a rate significantly higher than non-IB students.

There are some limitations and gaps in this research study. First, the researchers defined an IB student as a student who took at least one IB class; therefore, this research did not distinguish between IB diploma candidates and IB course candidates. Also, since their sample came from Title I schools, IB students from independent schools were not included in this study. Additionally, they did not conduct any tests to determine if their findings were statistically significant.

Pilchen et al. (2019). Pilchen et al. (2019) is perhaps the most comprehensive of the studies that examines college outcomes of IB students because the researchers looked at all students who graduated from high school in the United States in 2013. The researchers used descriptive statistics to compare college enrollment, retention, and 4-year graduation rates of IB diploma candidates, IB course candidates, and all students. There were 37,348 IB participants in this study: 18,660 diploma candidates and 18,668 IB course candidates. The researchers did not include the total number of high school students in the class of 2013. They conducted their analysis first by comparing all IB students combined to the overall population. Then they compared IB diploma candidates to IB course candidates.

They found that IB students enrolled in 4-year colleges at much higher rates, with 75% of IB students enrolling in a 4-year college in the fall immediately after high school graduation and only 40% of all 2013 high school graduates. IB diploma candidates had a higher enrollment rate in college than IB course candidates did. They also found that IB diploma candidates enrolled in more selective colleges at higher rates than IB course candidates.

The researchers next looked at 1- and 2-year college retention rates. They found that the 1-year retention rate of IB students was higher than non-IB students. They also found that the 1-year retention rate was higher for IB diploma candidates than IB course candidates. These trends continue when looking at the 2-year retention rates.

The last relevant outcome these researchers examined was 4-year college graduation rate. They found that only 41% of all students graduated from college within 4 years, compared to 62% of IB students. In addition to all IB students graduating from college at higher rates, they found that IB diploma candidates graduated at higher rates than IB course candidates. The researchers acknowledge that, while it is promising that IB students graduate from college at higher rates than non-IB students, 38% is a concerning percentage of IB students that did not graduate within 4 years. They suggest that future research include six-year graduation rates in addition to 4-year.

This study could have been made stronger by conducting further analysis to determine the statistical significance of the differences between the three study groups. A major limitation of this study is that it did not account for selection bias in any way. Despite these issues, this study remains an important contribution to the body of knowledge because it is one of the few that compares outcomes for IB diploma candidates and IB course candidates.

J. C. Hill (2013). The final study included in this literature review is the one that this study is replicating. For this dissertation, J. C. Hill compared various measures of college success of IB diploma candidates and IB course candidates from an independent school in South Korea who attended college in the United States. The sample studied included 543 IB students from the high school graduating classes of 2007-2012. There were 191 IB diploma candidates and 352 IB course candidates.

J. C. Hill analyzed 11 different quantitative factors, some of which would more usually be included in a discussion of the study's participants. These included the percentage of IB diploma candidates and IB course candidates per graduating class, as well as the gender breakdown and countries of origin of IB diploma candidates and IB course candidates. Some of the other factors analyzed included mean number of college acceptances, Ivy League acceptances, and the IB HL courses taken by the students accepted into Ivy League schools. These factors are not being analyzed in the present study, so they have not been included in this discussion. The other factors, which are being replicated in the present study, include college acceptance, college enrollment, college retention, and college graduation, as well as time to college graduation.

Using an independent t-test, J. C. Hill found that there was not a statistically significant difference in the college acceptance rates of IB diploma candidates and IB course candidates. The Chi-square test found that IB diploma candidates enrolled in college at higher rates than IB course candidates. The Chi-square test did not show a statistically significant difference in college freshman-to-sophomore retention rates. Independent t-tests did not show a statistically significant difference in graduation rates or in time to graduation. Put more simply, while IB diploma candidates had higher college enrollment rates, there was not a statistically significant difference between the two groups of students on any of the other college success factors.

The major limitation of this study is that selection bias was not accounted for. Another limitation is that this study was conducted in the unique context of a high-achieving independent school in South Korea that sends most of its graduates to the United States for college. The final limitation is that this study was conducted early in the school's implementation of the IB

program. This means that college graduation data was only available for two high school graduating classes.

Summary

The International Baccalaureate was developed in Geneva in the 1960s, led mostly by teachers and administrators at the International School in Geneva. The practical reason for its development was to provide a standardized curriculum for university admittance at colleges around the world. Hallmarks of the IB program, such as taking six courses as well as the IB core components, were shared and adopted at several conferences throughout the late 1960s. The first IB students got into college using their IB exam performance in 1970. After this point, the IB grew exponentially. Regional organizations and offices were established to aid in the administration of the program. The Primary Years Programme and the Middle Years Programme were established for younger students in the 1990s. The Career-Related Programme was created in 2012 for students planning to go into careers rather than college. Today, there are more than 5,600 IB schools in 159 countries across the world.

However, almost half of IB schools are located in the United States. Many of the IB trainings required of IB schools are located in the U.S., making it challenging for developing countries to attend. The effects are particularly true for many countries in Africa. Very few students take the IB History of Africa exam and the IB being offered in French is becoming unsustainable, which continues to show that the IB is not as international as they claim to be. Another criticism of IB is that the financial costs of having the IB program are so significant that it prevents some schools from being able to offer it to their students. Even when schools do offer the IB program, often students of color and low-income students do not participate. The IB

program is also stressful for the students who choose to participate in it because of the intense workload and high expectations.

Despite these criticisms, research shows that there are many benefits to the IB program. One of these benefits is that it has high academic standards, which makes it appealing to many schools. The main focus of this study is on the college success benefits that IB provides. Qualitative studies show that the IB program develops skills that are useful in college, such as study skills, critical thinking, communicating, and being open to other ideas and perspectives. Studies also show that colleges view students who participated in the IB program positively because they believe the IB program prepares students well for university study. There are extensive qualitative studies done on student perceptions of the IB program. Students feel that participating in the IB program improves their chances of getting into college, especially into a good college. They also believe that the IB program will give them the skills they need to succeed in college. IB students in college also say that they feel their participation in the IB program in high school contributed to their college success.

Few studies using quantitative measures have been done on the IB program and college success. Those that have been done found that IB students are more likely to be accepted to, enroll in, stay in, and graduate from college. IB students are more likely to attend a prestigious college and more likely to have higher college GPAs than non-IB students. Additionally, IB diploma candidates are more likely to graduate from college than IB course candidates. However, not all of these studies account for selection bias in their methodology. Also, not all of them differentiate between IB diploma candidates and IB course candidates.

Gaps in the Literature

In their review of the literature related to IB, Dickson et al. (2018) found that "most of the studies, both qualitative and quantitative, examined stakeholders' perspectives or self-reported experiences of IB programmes; a very small number used research designs that control for confounding factors or allow causal inferences to be drawn" (p. 240). As shown in this literature review, there are plenty of studies on perceptions of the IB program. There are few quantitative studies on IB as it relates to college success outcomes; in fact, there are only five scholarly studies on this topic published in the last 13 years. Of these five studies, only two differentiate between the outcomes of IB diploma candidates and the outcomes of IB course candidates. Additionally, three of these five studies do not account for selection bias, which refers to the potential that IB diploma candidates already have naturally occurring characteristics that would predispose them to being more successful in college than IB course candidates. Two of these studies do not include students from independent schools in their sample. Also, the most recent high school graduating class included in any of these studies is 2013, which was 10 years ago. J. C. Hill (2013), which this study is in large part replicating, differentiates between IB diploma candidates and IB course candidates, but it does not account for selection bias. The most recent high school graduating class included is 2012. Also, J. C. Hill was only able to include two high school graduating classes when analyzing college graduation data because of when the IB program began at the study site.

This study aimed to fill these gaps in the body of knowledge in several ways. First, it included more recent high school graduating classes in its findings by using the classes of 2014-2022. Second, it provided data for an independent school in the United States, a type of school left out of many of the other studies. Third, it accounted for selection bias by creating a matched

sample based on unweighted high school GPA. Finally, it differentiated between IB diploma candidates and IB course candidates in order to determine if it is worth it for students to take on the extra work and stress of pursuing the full IB diploma to achieve better outcomes in college.

CHAPTER 3

METHODS

The purpose of this study was to determine if there is a difference in college-related outcome achievement between IB diploma candidates and IB course candidates. It has long been the assumption of many at the study site that being an IB diploma candidate improves college success outcomes more than being an IB course candidate. However, there is almost no evidence to support that claim. It is important for all stakeholders to know whether the extra work and stress of pursuing the full IB diploma is worthwhile when it comes to college success outcomes. Are students choosing to take on the additional work and stress of the full IB diploma when they would have the same outcomes by only taking IB courses? Alternatively, are students limiting their chances of college success by choosing not to participate in the full IB diploma? Being able to answer these questions is important information for any school that offers both levels of participation in the IB program. This chapter contains the methodology for investigating these questions, including the method for selecting participants, data sources, data collection, and data analysis. The chapter concludes with a discussion of the limitations, delimitations, assumptions, and ethical considerations of this study.

Evaluation Questions

This study replicated, in large part, J. C. Hill's 2013 study comparing the college success factors of IB diploma candidates and IB course candidates. Depending on what range of years is relevant to answer each question, the data came from the high school graduating classes of 2014-2022. The evaluation questions are:

1. To what extent do college acceptance rates differ between IB diploma candidates and IB course candidates?
2. To what extent do college enrollment rates differ between IB diploma candidates and IB course candidates…
    a. in the fall immediately after high school graduation?
    b. within the first year after high school graduation?
    c. within the second year after high school graduation?
3. To what extent do college freshman-to-sophomore retention rates differ between IB diploma candidates and IB course candidates?
4. To what extent do college graduation rates differ between IB diploma candidates and IB course candidates?
5. To what extent does time to college graduation differ between IB diploma candidates and IB course candidates?

Program Evaluation Approach

This program evaluation was a product evaluation within the CIPP evaluation model. It focused on several aspects of a product evaluation including short-term and long-term outcomes of the program, whether the program is meeting the needs of its beneficiaries, and informing how to improve the program (Stufflebeam, 2003). Stufflebeam (2003) wrote that "the purpose of a product evaluation is to measure, interpret, and judge" the outcomes of a program (para. 62). This evaluation did that by comparing the college-related outcomes of students who participated in the IB program to determine if there is a difference in outcome achievement depending on the level of participation in the IB program. These findings will inform whether to continue

emphasizing the importance of participating in the full IB diploma or to encourage more students to simply take IB courses.

Description of the Program Evaluation

This study was a causal-comparative study that looked to determine if there is a relationship between a student's level of participation in the IB program and college-related outcomes. It was ex-post-facto research since two pre-existing groups were studied. I collected data related to college acceptance, enrollment, retention, graduation, and time to graduation from Evergreen School graduating classes of 2014-2022. Statistical analysis was conducted to compare these college-related outcomes of IB diploma candidates and IB course candidates.

Role of the Researcher

For this evaluation, I took on the role of an internal evaluator. I have been a teacher in the IB program at Evergreen School since 2015. In order to avoid potential bias, quantitative data was used in this study and another external educator checked the accuracy of data collection and analysis.

Participants

The participants for this study came from graduates of Evergreen's IB program from the graduating classes of 2014-2022. See Table 2 for the number of IB diploma candidates and IB course candidates per class. As noted in Chapter 1, 75% of Evergreen's student body participated in the IB program during the time of this study.

Table 2

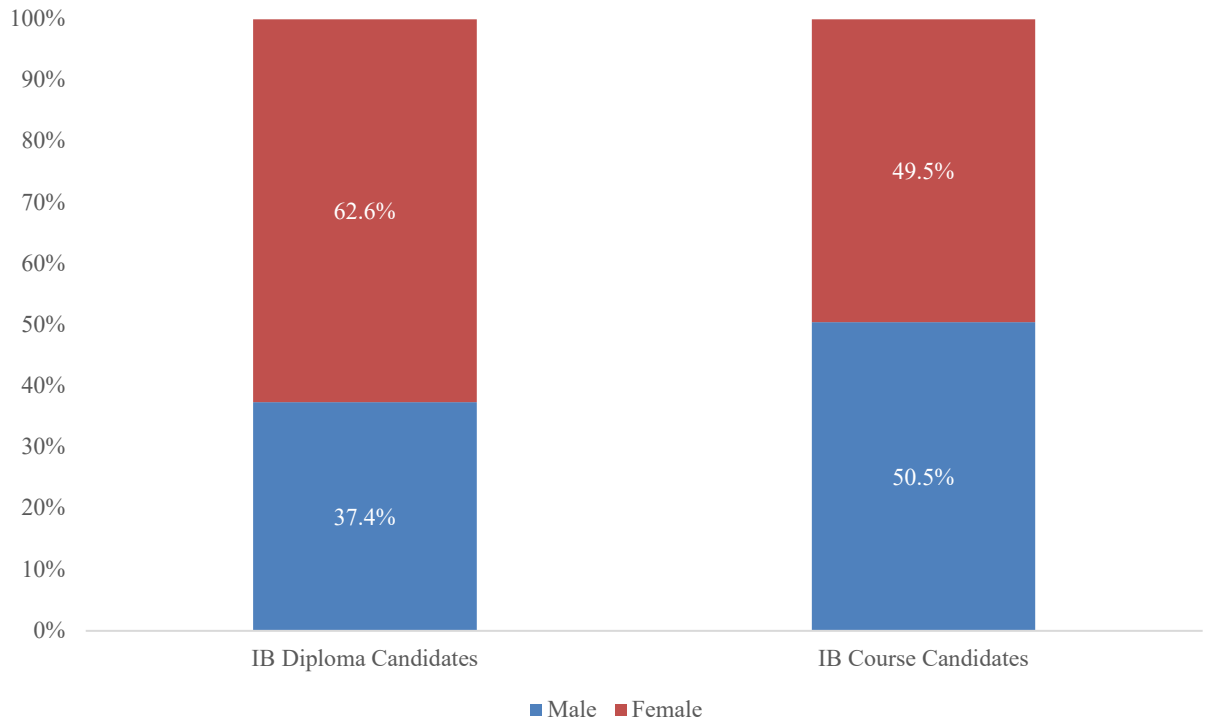
International Baccalaureate (IB) Students from Evergreen School

	Candidates	
Class	IB Diploma	IB Course
2014	18	53
2015	22	49
2016	28	47
2017	32	76
2018	41	48
2019	38	61
2020	36	48
2021	30	61
2022	20	62
Total	265	505

Although Evergreen School does not collect demographic data such as race/ethnicity and socioeconomic status, the gender of the students is available. See Figure 2 for the percentage of male and female IB diploma candidates and IB course candidates during the time of this study.

Figure 2

Gender Breakdown of International Baccalaureate (IB) Students



Each research question used participants from different ranges of graduating classes since they each required a different amount of time to have passed to answer it. See Table 3 for the graduating classes used to answer each evaluation question.

Table 3

High School Graduating Classes Used for Evaluation Questions

Question	Classes
1. To what extent do college acceptance rates differ between International Baccalaureate (IB) diploma candidates and IB course candidates?	2014-2022
2. To what extent do college enrollment rates differ between IB diploma candidates and IB course candidates…	
a. in the fall immediately after high school graduation?	2014-2022
b. within the first year after high school graduation?	2014-2021
c. within the second year after high school graduation?	2014-2020
3. To what extent do college freshman-to-sophomore retention rates differ between IB diploma candidates and IB course candidates?	2014-2021
4. To what extent do college graduation rates differ between IB diploma candidates and IB course candidates?	2014-2019
5. To what extent does time to college graduation differ between IB diploma candidates and IB course candidates?	2014-2019

The intent was for all of the IB diploma candidates to be included in the sample. However, some of their information was unable to be obtained from one of the two data sources for reasons to be discussed later, so they were not be able to be included. However, of the 265 IB diploma candidates, data from 252 of them (95%) was successfully obtained. A matched sample of IB course candidates was then created to account for selection bias. IB diploma candidates and IB course candidates were matched based on unweighted high school GPA since research shows that GPA is the strongest predictor of college success (Belfield & Crosta, 2012; Camara & Echternacht, 2000; DeBerard et al., 2004; Ledesma & Obukhova, 2015; Lotowski et al., 2004; Stumpf & Stanley, 2002). Although they were not used for matching, the students' weighted

GPAs are also included in the discussion of the results since that is the GPA that is sent to colleges to make acceptance decisions.

It is also important to note that these are independent groups. This means that a participant can only belong to one group (i.e., they are either an IB diploma candidate or an IB course candidate). Additionally, in a causal-comparative study, at least 51 participants are needed in each group to determine if there is a statistically significant difference between the two groups (Mertens & Wilson, 2019). After the matched sample was made, there were 178 participants per group, so there were more than enough participants to satisfy this requirement.

Data Sources

The data source for the first evaluation question was college counseling records. The data source for the other evaluation questions was the National Student Clearinghouse (NSC) StudentTracker for High Schools.

College Counseling Records

The Office of College Counseling at Evergreen School maintains records of college application and acceptance data. These records include which colleges students apply to as well as which they were accepted into. College counselors record college application data in a spreadsheet when they send the student's recommendation letter and transcripts to the college. Students report acceptances to the college counselors, who then record that information in the spreadsheet.

There are two potential reliability issues with these records. First, the college acceptance data is self-reported by the students to the college counselors. Although the college counselors make every effort to follow-up with students about their college acceptances, waitlists, and denials, it is certainly possible that some of this data is missing. Second, there was turnover in

the position of director of college counseling during the time of this study. From 2014 to present, there have been three different directors. It is possible that not all of the directors made the same effort to follow-up with students in order to maintain complete records. The current director, who has been a college counselor at Evergreen School for the entire time of this study, expressed some concerns about how complete these records are from 2018 to 2020. While there is some concern about 2018-2020, the current director feels confident that the college counseling records for 2014-2017 and 2021-2022 are complete and accurate (personal communication, 2023). In the end, there were nine IB course candidates and one IB diploma candidate whose college counseling data was incomplete, so they were removed from eligibility to be included in the sample. The data was determined to be incomplete if there was a college listed that a student applied to, but no admissions decision was listed.

NSC StudentTracker for High Schools

NSC (2021) provides college enrollment and graduation data for 97% of students in colleges in the United States. This data is reported to NSC by the more than 3,600 colleges and universities that participate in this service. For an annual subscription fee, high schools get access to reports on the college enrollment and graduation trends of their alumni. These reports include dates of enrollment, transfer, and graduation, as well as the name of the college(s) attended, whether it is public or private, and 2-year or 4-year. College registrars report their data to NSC and they typically do so monthly (NSC, 2014).

There are two limitations with using NSC as a data source. The first limitation has to do with matching students whose data is requested by high schools with the NSC database. In most cases, over 95% of data requested can be matched based on the student's name and birthday (NSC, 2014). In cases where there is more than one student with the same name and birthday,

information such as high school attended and date of college graduation are used to make the match. Names being spelled incorrectly is another common reason for difficulty with matching. Although NSC has developed an algorithm to account for common misspellings, nicknames, and so forth, no algorithm can account for all name variations, so some students may be missing from the report or be matched incorrectly. The second limitation is that some students exercise their Family Educational Rights Privacy Act (FERPA) right to block the release of their data. NSC (2014) reports that approximately 5% of students do so. Despite these potential issues with retrieving student data, NSC is typically able to provide data for 93-95% of students requested (NSC, 2014). There were 12 IB diploma candidates and 18 IB course candidates whose data was missing from the NSC report, so they were removed from eligibility to be included in the sample.

Data Collection

Evergreen School has a subscription to NSC through the Office of College Counseling. They use NSC to report on college enrollment data of each graduating class in the fall after their graduation. The Head of School also uses NSC to report data to the Board. The names of all IB students who graduated from Evergreen School between 2014 and 2022 were sent to NSC in August of 2023. NSC then sent back a detailed report in the form of a spreadsheet. This spreadsheet includes student names, the name of the college they enrolled in, the date they enrolled, whether they graduated or not, and the date of their graduation. The Office of College Counseling provided their college acceptance data records. Both the college acceptance records and the NSC report were given to the registrar of Evergreen School, who combined the two sources of data. The registrar also added in the year the students graduated from Evergreen School, weighted and unweighted high school GPAs, and level of participation in the IB program upon high school graduation. Finally, the registrar randomly assigned the students ID numbers

and then removed their names before sending the information to me. This protected the students' privacy and the potential that they might be identified.

Data Analysis

The data was organized in an Excel spreadsheet, which was uploaded to SPSS to conduct the statistical tests. See Table 4 for the data sources and analysis methods for each evaluation question.

Evaluation Question 1 – College Acceptance

First, the college acceptance rate for each participant was determined by dividing the number of colleges a student was accepted into by the number they applied to. For the purposes of this study, if a student was waitlisted, it was counted as a denial. The mean college acceptance rate of both groups was then be calculated. Since this evaluation question required comparing the means of two independent groups, a t-test for independent samples was conducted (Mertens & Wilson, 2019). The null hypothesis (H_0) for this question was that there would not be a statistically significant difference between the college acceptance rates of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there would be a statistically significant difference between the college acceptance rates of IB diploma candidates and IB course candidates. The null hypothesis will be rejected with a p value of less than .05. The range of colleges the students applied to is also included in the discussion of this question.

Evaluation Question 2 – College Enrollment

College enrollment is a dichotomous variable (i.e., a student is either enrolled or not enrolled). Therefore, the intention was to conduct a Chi-square test for comparison. However, the assumptions for a valid Chi-square test were not met for this evaluation question since the expected value in some of the cells was less than five. Therefore, Fisher's exact test was used

(Agresti, 2007). The null hypothesis (H_0) for this question was that there would not be a statistically significant difference between the college enrollment rates of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there would be a statistically significant difference between the college enrollment rates of IB diploma candidates and IB course candidates. The null hypothesis will be rejected with a *p* value of less than .05. Included in the analysis of this question is also a reporting of the selectivity of the most common colleges that Evergreen's IB students enrolled in.

Evaluation Question 3 – College Retention

College freshman-to-sophomore retention is also a dichotomous variable; the student either continued their enrollment from freshman to sophomore year or they did not. So again, a Chi-square test was conducted for comparison. The null hypothesis (H_0) for this question was that there would not be a statistically significant difference between the college retention rates of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there would be a statistically significant difference between the college retention rates of IB diploma candidates and IB course candidates. The null hypothesis will be rejected with a *p* value of less than .05.

Evaluation Question 4 – College Graduation

College graduation was the final dichotomous variable in this study since a student has either graduated from college or they have not. Therefore, a Chi-square test was used to compare the occurrences of college graduates in each group. The null hypothesis (H_0) for this question was that there would not be a statistically significant difference between the college graduation rates of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there would be a statistically significant difference between the college graduation rates of IB

diploma candidates and IB course candidates. The null hypothesis will be rejected with a *p* value of less than .05.

Evaluation Question 5 – Time to College Graduation

The mean amount of time it takes for students in each group to graduate from college was calculated. A t-test for independent samples was used to compare the mean time to graduation. The null hypothesis (H_0) for this question was that there would not be a statistically significant difference between the time to college graduation of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there would be a statistically significant difference between the time to college graduation of IB diploma candidates and IB course candidates. The null hypothesis will be rejected with a *p* value of less than .05.

Table 4

Data Sources and Analysis for Evaluation Questions

Evaluation Question	Data Source	Data Analysis
1. To what extent do college acceptance rates differ between International Baccalaureate (IB) diploma candidates and IB course candidates?	College counseling records	t-test for independent samples
2. To what extent do college enrollment rates differ between IB diploma candidates and IB course candidates… a. in the fall immediately after high school graduation? b. within the first year after high school graduation? c. within the second year after high school graduation?	National Student Clearinghouse StudentTracker for High Schools (NSC)	Fisher's exact test
3. To what extent do college freshman-to-sophomore retention rates differ between IB diploma candidates and IB course candidates?	NSC	Chi-square test
4. To what extent do college graduation rates differ between IB diploma candidates and IB course candidates?	NSC	Chi-square test
5. To what extent does time to college graduation differ between IB diploma candidates and IB course candidates?	NSC	t-test for independent samples

Delimitations, Limitations, and Assumptions

Delimitations

One delimitation of this program evaluation was that it did not attempt to compare the college GPAs of IB diploma candidates and IB course candidates. Although college GPA could certainly be used to compare the college-related outcomes of IB students, this data is not readily available. Similarly, the caliber of colleges students were accepted into and enrolled in was not

considered. It was determined that, though analysis of this data could be used to evaluate the outcomes of the IB program, both were beyond the scope of this evaluation.

Another delimitation of this program evaluation was that qualitative data was not used. This choice was made for two reasons. The first is that there is ample qualitative data in the literature about IB and college (Culross & Tarver, 2011; Dickson et al., 2018; Grose & Sanchez, 2021; Hertberg-Davis et al., 2006; Taylor & Porath, 2006), while there is a significant gap in quantitative comparisons that use "adequate controls for student characteristics" (Dickson et al., 2018, p. 255). Second, there is more potential for bias in analyzing qualitative data. Since I am an internal evaluator, using quantitative data left little room for potential bias in analysis.

The final delimitation of this study is that students who did not participate in the IB program were not included in this study. The purpose of this study was not to justify the school's implementation of the IB program by comparing the college outcomes of IB students and non-IB students. Instead, its purpose was to see if there is a difference in college-related outcome achievement between the two different kinds of IB students to inform decision-making. For that same reason, there was not an attempt made to compare the outcomes of students who participated in IB program to those who took AP courses.

Limitations

A limitation of this program evaluation is the availability of data from NSC. If a student attended a college outside of the United States, attended a college the does not send data to NSC, is unable to be matched by NSC, or blocked the release of their records, they were not able to be included in this study. NSC (2014) reports that it is typically able to provide data for 93-95% of students whose data is requested. Of the 770 IB students eligible to be included in the sample, the data for 30 of them was unable to be reported. This left a total of 252 IB diploma candidates

(95%) and 487 IB course candidates (96%) eligible to be included in the sample, both of which are far greater than the minimum of 51 participants needed to determine if there is a statistically significant difference between two groups in a causal-comparative study (Mertens & Wilson, 2019).

As discussed earlier, there is a potential issue with the reliability of college acceptance data. Students may not have reported all of their college acceptances, waitlists, and denials to the college counselors. Also, there have been three different directors of college counseling during the time of this study. Each director may not have made the same effort to maintain accurate and complete records. In the end, the data was mostly complete. Only 10 students had incomplete college counseling records and were therefore removed from eligibility.

A final limitation was the internal threat to validity of differential selection, which refers to differences in the experimental and control groups "other than receipt of the intervention" (Mertens & Wilson, 2019, p. 292) and that "predispose them to have certain outcomes" (Creswell & Creswell, 2018, p. 170). For this program evaluation, this is referring to the potential that IB diploma candidates already have naturally occurring characteristics that would predispose them to being more successful in college than IB course candidates. Random assignment to groups is recommended to mitigate this threat, but that was not possible for this program evaluation. Therefore, the strategy of a matched sample was used to mitigate the impact of selection bias. Since research shows that GPA is the strongest predictor of college success, students with the same or similar unweighted GPAs from each of the groups were chosen to be included in the sample (Belfield & Crosta, 2012; Camara & Echternacht, 2000; DeBerard et al., 2004; Ledesma & Obukhova, 2015; Lotowski et al., 2004; Stumpf & Stanley, 2002). This way, it was able to be determined whether it was the effect of their level of participation in the IB

program and not simply their natural ability that affected students' college success outcomes.

Assumptions

There are three statistical assumptions of a t-test for independent samples, which is the test that was used to answer two of this study's evaluation questions. The first assumption is that the groups being studied are independent. This assumption was met in this study since there is no overlap between the two groups; a student can only be an IB diploma candidate or an IB course candidate. The second assumption is that the data is normally distributed. However, t-tests are robust to non-normal data if the sample is 30 participants or more. Since this study had 178 participants in each group, the results of the t-test are considered reliable even if the distribution is non-normal. The final assumption of an independent t-test is that both groups have the same variance. Again, since the sample size was large in this study, the t-test is robust.

The Chi-square test, which was intended to be used to answer three of this study's evaluation questions, also has statistical assumptions. Just like the t-test for independent samples, the first assumption is that the groups are independent. As mentioned earlier, this assumption was met since students can only be IB diploma candidates or IB course candidates. The other assumption is that the expected value in each cell of the Chi-square is five or more. This assumption was met for the Chi-square tests to compare the college retention and college graduation rates of the two groups. However, it was not met to compare the college enrollment rates. Therefore, Fisher's exact test was used (Agresti, 2007).

Ethical Considerations

I received initial, verbal approval to complete this program evaluation in its specific context from relevant stakeholders at Evergreen School. These stakeholders include the Head of School, Head of Employee Life, IB Coordinator, Director of College Counseling, Registrar, and

Faculty Development Coach. I held a meeting with all of them in September of 2022 to discuss my plans for this study, get their input, and receive permission. I have held individual follow-up meetings with several of these stakeholders to further discuss this study. After the successful dissertation proposal defense, I again met with all stakeholders to affirm their formal approval of this project. Further approval to conduct this study was obtained from the William & Mary Education Institutional Review Committee.

Participants were protected from potential harm in several ways. When I received the data, no names were attached; instead, they were assigned randomized identification numbers by the registrar. This protected the participants' anonymity and conformed with FERPA laws. All data was kept on a password-protected computer.

CHAPTER 4

FINDINGS

The purpose of this study was to determine if there is a difference in college-related outcome achievement between IB diploma candidates and IB course candidates. IB diploma candidates take six IB courses, as well as completing the three IB core elements, which include an extra course, a research paper, and community service. At the site of this study, these additional requirements mean that IB diploma candidates have one study hall period when other students have two. They also have the additional stress of taking six IB courses at the same time, while IB course candidates simply take one or more IB courses. The assumption in the school community is that IB diploma candidates are more likely to get into college and succeed in college than IB course candidates. This study aimed to find evidence to support or dispel that assumption. Are students choosing to take on the additional work and stress of the full IB diploma when they would have the same college outcomes by taking IB courses? Alternatively, are students limiting their chances of college success by choosing not to participate in the full IB diploma?

This study replicated, in large part, J. C. Hill's 2013 study comparing the college success factors of IB diploma candidates and IB course candidates. Depending on what range of years is relevant to answer each question, the data came from the high school graduating classes of 2014-2022. The evaluation questions are:

1. To what extent do college acceptance rates differ between IB diploma candidates and IB course candidates?

2. To what extent do college enrollment rates differ between IB diploma candidates and IB course candidates…
    a. in the fall immediately after high school graduation?
    b. within the first year after high school graduation?
    c. within the second year after high school graduation?
3. To what extent do college freshman-to-sophomore retention rates differ between IB diploma candidates and IB course candidates?
4. To what extent do college graduation rates differ between IB diploma candidates and IB course candidates?
5. To what extent does time to college graduation differ between IB diploma candidates and IB course candidates?

This chapter contains the results of the data analysis, beginning with a discussion of how the matched sample was made, as well as descriptive statistics on the sample. Following that, the findings for each of the evaluation questions are presented. This chapter concludes with a brief summary of the findings.

Sample

The first step in conducting this study was to create the matched sample of IB diploma candidates and IB course candidates based on unweighted high school GPA. There were 770 students who participated in the IB program at Evergreen School between 2014 and 2022: 265 diploma candidates and 505 course candidates. First, students whose data was not available in the National Student Clearinghouse (NSC) were removed from eligibility, which was 12 IB diploma candidates and 18 IB course candidates. Then, the one IB diploma candidate and nine IB course candidates who had incomplete college acceptance data in the college counseling

records were removed from eligibility. The data was determined to be incomplete if there was a college listed that a student applied to, but no admissions decision was listed. The five IB course candidates who did not apply to college were also removed from eligibility. Finally, course candidates who participated in one or more of the IB core components were removed from eligibility. The core components include the Theory of Knowledge (TOK) course; Extended Essay (EE); and Creativity, Activity, and Service (CAS). These students were removed to ensure that both groups were independent by accounting for attrition of IB diploma candidates. Few IB course candidates elect to participate in any of the IB core components. However, students who choose not to continue as IB diploma candidates will often continue to be enrolled in one or more of the core components. Evergreen School does not track students who begin as IB diploma candidates but drop down to being IB course candidates. Using participation in the IB core components was determined to be the best way to ensure that the two groups of participants maintained their independence. Therefore, IB course candidates who participated in any of the IB core components were removed from eligibility. This left 684 students eligible to be included in the sample: 252 IB diploma candidates and 432 IB course candidates.

Then, the matched sample was created by sorting all the participants based on their unweighted high school GPA. There were 154 IB course candidates that had the same unweighted GPA as an IB diploma candidate, so those exact matches were made. Then, close matches were made. A close match was defined as one where the unweighted GPAs of the two participants were within .05 of each other. The .05 margin was chosen since this is the standard *p* value used to determine statistical significance. I made 24 close matches, with 12 of those being matches where the GPA of the IB course candidate was lower than that of the IB diploma candidate, and 12 being matches where the GPA of the IB course candidate was higher than that

of the IB diploma candidate. There were 328 potential participants who were not able to be exactly matched or closely matched; therefore, they were eliminated from the study. The total number of participants in this study was 356 students: 178 IB diploma candidates and 178 IB course candidates. The average unweighted GPA of both groups was 3.51. See Table 5 for the number of IB diploma candidates and IB course candidates included in the sample in each high school graduating class.

Table 5

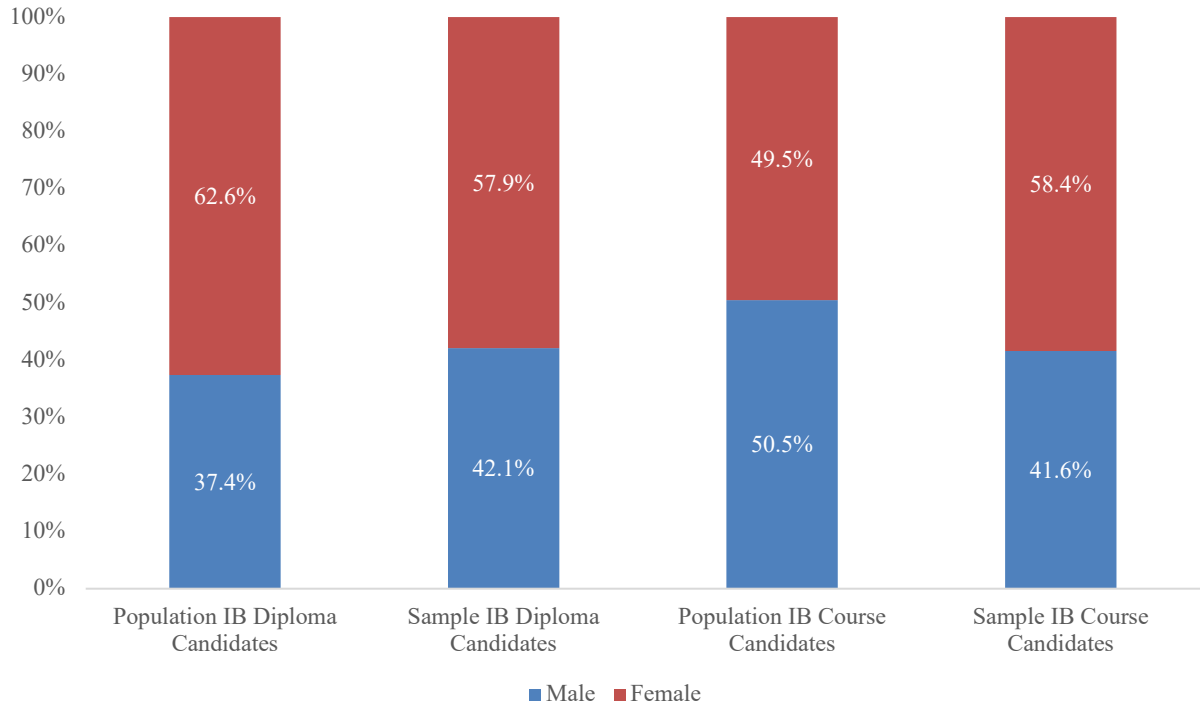
International Baccalaureate (IB) Diploma Candidates and Course Candidates per Class in Sample

	Candidates	
Class	IB Diploma	IB Course
2014	12	18
2015	15	19
2016	21	18
2017	22	28
2018	30	19
2019	26	22
2020	24	18
2021	16	20
2022	12	16
Total	178	178

Although demographic data such as race/ethnicity and socioeconomic status is not collected by Evergreen School, the gender of the students is available. In the sample, there were 103 female IB diploma candidates and 75 male IB diploma candidates; there were 104 female IB course candidates and 74 male IB course candidates. Participants were not matched on gender, but the percentage of male and female participants in each group ended up being similar. There was also not an attempt to make the gender breakdown of the sample match that of the population. See Figure 3 for how this gender breakdown compares to the population.

Figure 3

Gender Breakdown of Sample and Population



Note. IB = International Baccalaureate

Other relevant data collected on participants included weighted GPA, number of IB courses taken, and number of IB Higher Level (HL) courses taken. While unweighted GPA was used for creating the matched sample, weighted GPA was also collected for each participant since that is the GPA that is recorded on the high school transcripts sent to colleges as part of a student's college application. The average weighted GPA of the IB diploma candidates in this study was 4.36, while it was 4.01 for IB course candidates. See Table 6 for the standard deviation, minimum, and maximum for each group.

Table 6

Weighted GPA Group Statistics

IB Status	*M*	*SD*	Min.	Max.
Diploma	4.36	.287	3.65	5.09
Course	4.01	.399	2.81	4.93

Note. IB = International Baccalaureate

The average number of IB courses taken by IB diploma candidates was 6.26, while it was 2.61 for IB course candidates. Students pursuing the full IB diploma must take one course from each of the six IB subjects, which include English, a second language, social studies, science, math, and art. IB course candidates take one or more IB courses in any of these subjects. See Table 7 for group statistics.

Table 7

Number of International Baccalaureate Courses Taken Group Statistics

IB Status	*M*	*SD*	Min.	Max.
Diploma	6.26	.439	6	7
Course	2.61	1.46	1	6

IB courses are offered at standard level (SL) and higher level (HL). HL courses require additional hours of seat time and cover more content than SL courses. Students also must demonstrate more depth of analysis on assessments. IB diploma candidates must take three SL and three HL courses, although some students take two SL and four HL courses. The average number of HL courses taken was 3.53 for IB diploma candidates and 1.35 for IB course candidates. See Table 8 for group statistics.

Table 8

Number of Higher Level Courses Taken Group Statistics

IB Status	*M*	*SD*	Min.	Max.
Diploma	3.53	.533	3	5
Course	1.35	1.09	0	4

Note. IB = International Baccalaureate

Evergreen School also offers a few AP courses, which are the most popular kind of college preparatory course offered in the United States (Fazlul et al., 2021; Owen, 2023). Since taking college preparatory courses is one of the most important factors in college admissions

decisions, that data was also collected for the participants in this study (Claybourn, 2022; College Board, 2023b). IB diploma candidates took an average of 1.7 AP courses and IB course candidates took an average of 1.9 AP courses.

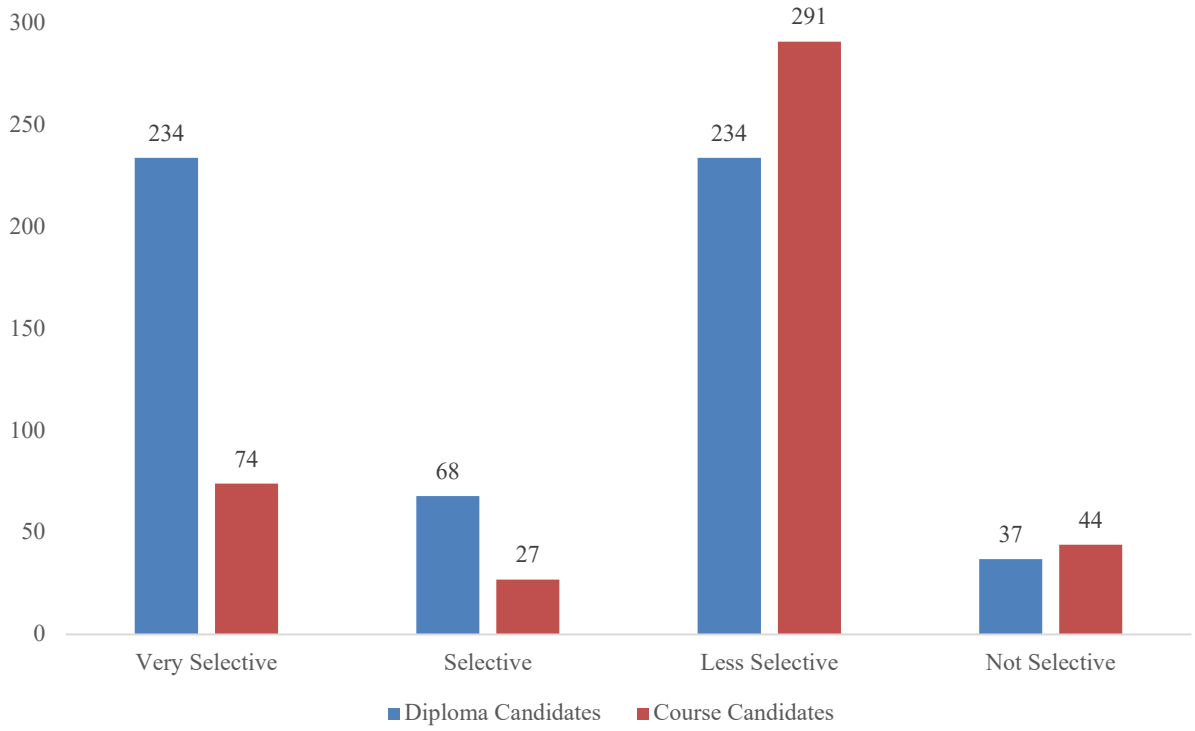
College Acceptance Rates

The college acceptance rate of IB diploma candidates and IB course candidates was the first college success outcome compared. For this question, the full sample of 356 participants from the classes of 2014-2022 was used. The college acceptance rate was calculated for each participant by dividing the number of colleges they were accepted into by the number that they applied to. For the purposes of this study, if a student was waitlisted, it was counted as a denial. Then, a t-test for independent samples was conducted. The null hypothesis (H_0) for this question was that there is not a statistically significant difference between the college acceptance rates of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there is a statistically significant difference between the college acceptance rates of IB diploma candidates and IB course candidates. A *p* value of less than .05 was used to determine if the null hypothesis was rejected.

IB diploma candidates applied to an average of 5.84 colleges, with a range of 1–23 applications. IB course candidates applied to an average of 5.52, with a range of 1–15 applications. See Figure 4 for the selectivity of the top 10 most common colleges participants applied to according to their College Board selectivity rating (College Board, 2023a). It is worth noting that of the 36 applications to Ivy League schools, 31 of them were from IB diploma candidates; five were from IB course candidates.

Figure 4

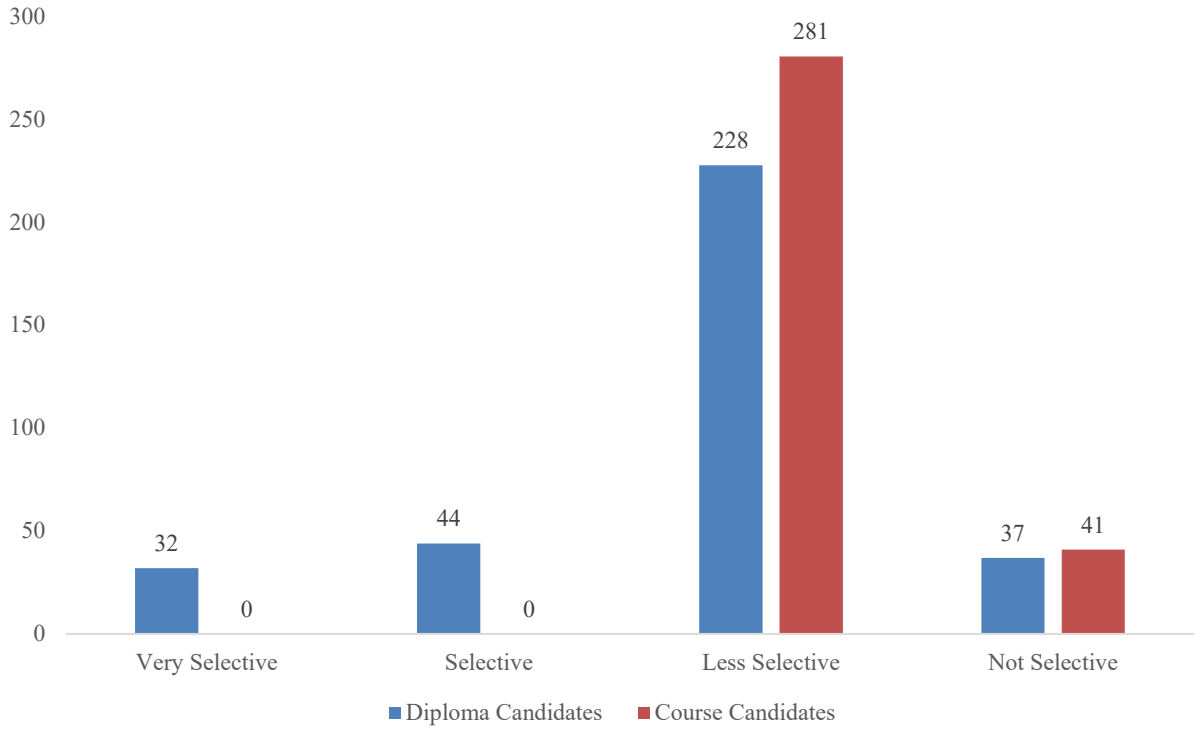
Selectivity of the Most Common Colleges Applied to



IB diploma candidates were accepted into an average of 3.76 colleges and IB course candidates were accepted into an average of 4.03 colleges. See Figure 5 for the selectivity of the top 10 most common colleges participants were accepted into according to their College Board selectivity rating (College Board, 2023a). In the sample, two students were accepted into Ivy League schools; both were IB diploma candidates.

Figure 5

Selectivity of the Most Common Colleges Accepted Into



IB diploma candidates had an average college acceptance rate of 71.6%, while IB course candidates had an average acceptance rate of 80.6%. See Table 9 for group statistics.

Table 9

College Acceptance Rate Group Statistics

IB Status	*M*	*SD*	Min.	Max.
Diploma	71.56%	23.69%	16.67%	100%
Course	80.55%	20.01%	25%	100%

Note. IB = International Baccalaureate

The results of the t-test for independent samples, t (354) = -3.869, p = <.001, indicated that there is a statistically significant difference in the college acceptance rate of IB diploma candidates and IB course candidates. Since p (<.001) is less than α (.05), the null hypothesis was rejected. IB course candidates have a higher college acceptance rate. The effect size was medium (Cohen's d = -.410).

College Enrollment Rates

The college enrollment rates of IB diploma candidates and IB course candidates was analyzed in three parts, again using the full sample of 356 students from the classes of 2014-2022. First, the college enrollment rates in the fall immediately after high school graduation were compared. Next, students who enrolled in college within the first year after high school graduation were added in, followed by students who enrolled in college within two years after high school graduation. The intention was to conduct a Chi-square test for comparison; however, the assumptions for a valid Chi-square test were not met. Therefore, Fisher's exact test was used (Agresti, 2007). The null hypothesis (H_0) was that there is not a statistically significant difference between the college enrollment rates of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there is a statistically significant difference between the college enrollment rates of IB diploma candidates and IB course candidates. A p value of less than .05 was used to determine if the null hypothesis was rejected.

Immediately After High School Graduation

Of the 178 students in each group, 173 IB diploma candidates and 174 IB course candidates enrolled in college immediately after high school graduation. This means that IB diploma candidates had an immediate college enrollment rate of 97.2% and IB course candidates had one of 97.8%. Table 10 presents the crosstabulation of level of participation in the IB

program and immediate college enrollment rate. Since there was an expected count that is less than five in one of the cells, the conditions to run a Chi-square test were not met. Therefore, Fisher's exact test was used (Agresti, 2007). The Fisher's exact test failed to reject the null hypothesis ($p = 1$). The test indicated that there is not a statistically significant relationship between IB status and immediate college enrollment.

Table 10

Crosstabulation for Immediate College Enrollment

IB Status	Counts	Immediately Enrolled		Total
		No	Yes	
Diploma	Count	5	173	178
	Expected Count	4.5	173.5	178
	% Within Immediately Enrolled	55.6%	49.9%	50%
Course	Count	4	174	178
	Expected Count	4.5	173.5	178
	% Within Immediately Enrolled	44.4%	50.1%	50%
Total	Count	9	347	356
	Expected Count	9	347	356
	% Within Immediately Enrolled	100%	100%	100%

Note. IB = International Baccalaureate

Within the First Year After High School Graduation

Students who enrolled in college within 1 year after high school graduation were added to the college enrollment numbers. Three more IB diploma candidates enrolled in college, for a total of 176 out of 178. IB diploma candidates had a 1-year college enrollment rate of 98.9%. One more IB course candidate enrolled in college, bringing that total to 175 out of 178. IB course candidates had a 1-year college enrollment rate of 98.3%. Table 11 presents the crosstabulation of level of participation in the IB program and college enrollment rate within 1 year after high school graduation. Since there was an expected count that is less than 5 in 3 of the cells, the conditions to run a Chi-square test were not met. Therefore, Fisher's exact test was used (Agresti, 2007). The Fisher's exact test again failed to reject the null hypothesis ($p = .623$). The test indicated that there is not a statistically significant relationship between IB status and 1-year college enrollment.

Table 11

Crosstabulation for College Enrollment Within 1 Year

IB Status	Counts	Enrolled Within 1 Year		Total
		No	Yes	
Diploma	Count	1	177	178
	Expected Count	2	176	178
	% Within Enrolled Within 1 Year	25%	50.3%	50%
Course	Count	3	175	178
	Expected Count	2	176	178
	% Within Enrolled Within 1 Year	75%	49.7%	50%
Total	Count	4	352	356
	Expected Count	4	352	356
	% Within Enrolled Within 1 Year	100%	100%	100%

Note. IB = International Baccalaureate

Within the Second Year After High School Graduation

Finally, students who enrolled in college within 2 years after high school graduation were added to the calculation of college enrollment rate. All 178 IB diploma candidates enrolled in college within 2 years of high school graduation, giving them a 100% college enrollment rate. For IB course candidates, 177 enrolled in college within 2 years after high school graduation, which is a 99.4% college enrollment rate. Table 12 presents the crosstabulation of level of participation in the IB program and college enrollment rate within 2 years after high school graduation. Since there was an expected count that is less than 5 in 3 of the cells, the conditions to run a Chi-square test were not met. Therefore, Fisher's exact test was used (Agresti, 2007).

The Fisher's exact test failed to reject the null hypothesis ($p = 1$). The test indicated that there is not a statistically significant relationship between IB status and immediate college enrollment.

Table 12

Crosstabulation for College Enrollment Within 2 Years

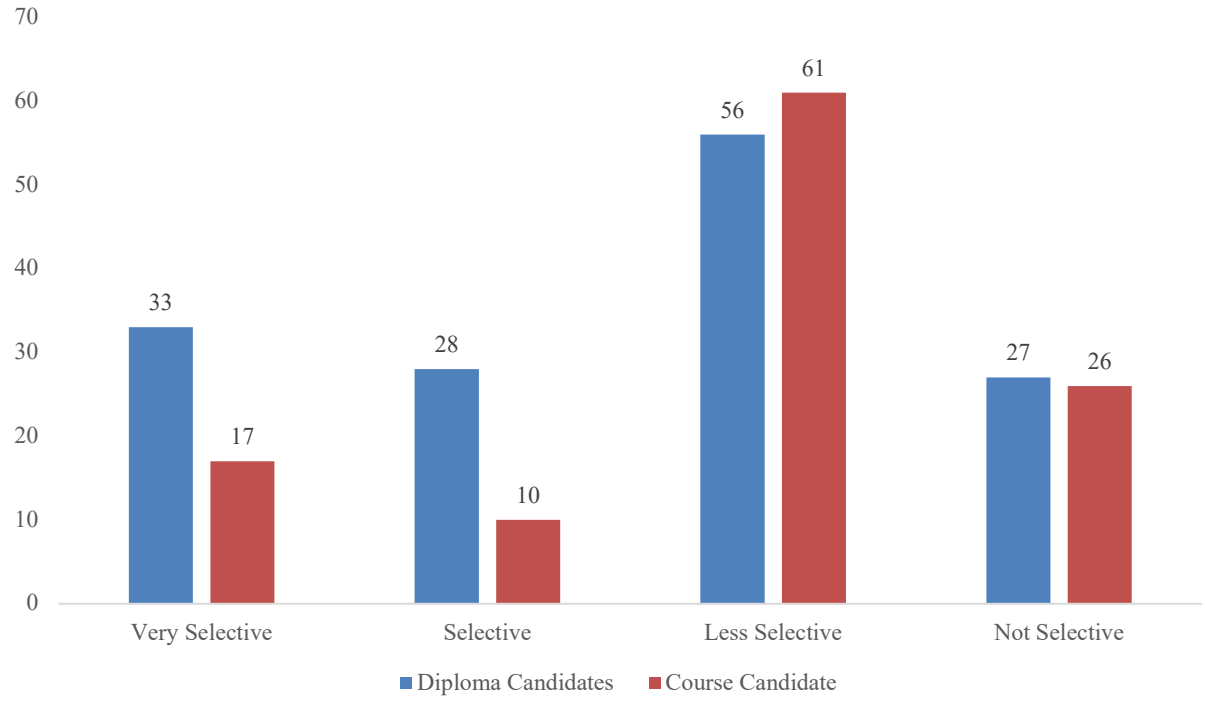
IB Status	Counts	Enrolled Within 2 Years		Total
		No	Yes	
Diploma	Count	0	178	178
	Expected Count	.5	177.5	178
	% Within Enrolled Within 2 Years	0%	50.1%	50%
Course	Count	1	177	178
	Expected Count	.5	177.5	178
	% Within Enrolled Within 2 Years	100%	49.9%	50%
Total	Count	1	355	356
	Expected Count	1	355	356
	% Within Enrolled Within 2 Years	100%	100%	100%

Note. IB = International Baccalaureate

See Figure 6 for the selectivity of the top 10 most common colleges participants enrolled in according to their College Board selectivity rating (College Board, 2023a).

Figure 6

Selectivity of the Most Common Colleges Enrolled In



Freshman-to-Sophomore Retention Rates

The college freshman-to-sophomore retention rate was compared using a Chi-square test. For this question, the high school graduating classes of 2014-2021 were used, which was 166 IB diploma candidates and 162 IB course candidates. A student who returned to college in the year immediately after their first year in college, whether it was the one they initially enrolled in or if they transferred to another college, was considered retained. The null hypothesis (H_0) for this question was that there is not a statistically significant difference between the college retention rates of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there is a statistically significant difference between the college retention rates of IB diploma candidates and IB course candidates. A *p* value of less than .05 was used to determine if the null hypothesis was rejected.

Of the 166 IB diploma candidates that enrolled in college, 160 of them returned for a second year, giving IB diploma candidates a 96.4% college freshman-to-sophomore retention rate. Of the 161 IB course candidates that enrolled in college, 152 of them returned for a second year, giving IB course candidates a 94.4% college freshman-to-sophomore retention rate. Table 14 presents the crosstabulation of level of participation in the IB program and college freshman-to-sophomore retention rate. The Chi-square, $\chi^2(1, N = 327) = .729$, $p = .393$, test of association indicated that there was no relationship between the variables. Since p (.393) was greater α (.05), the data failed to reject the null hypothesis. This means that, while IB diploma candidates have a higher retention rate, it is not a statistically significant difference. The Phi coefficient of .047 further supports that there is no relationship or a negligible relationship between the variables.

Table 13

Crosstabulation for College Freshman-to-Sophomore Retention

IB Status	Count	Not Retained	Retained	Total
Diploma	Count	6	160	166
	Expected Count	7.6	158.4	166
	% within retained	40%	51.3%	50.8%
Course	Count	9	152	161
	Expected Count	7.4	153.6	161
	% within retained	60%	48.7%	49.2%
Total	Count	15	312	327
	Expected Count	15	312	327
	% within retained	100%	100%	100%

Note. IB = International Baccalaureate

College Graduation Rates

College graduation was the final college success outcome in this study that was compared using a Chi-square test. The null hypothesis (H_0) for this question was that there is not a statistically significant difference between the college graduation rates of IB diploma candidates and IB course candidates. The alternate hypothesis (H_1) was that there is a statistically significant difference between the college graduation rates of IB diploma candidates and IB course candidates. A *p* value of less than .05 was used to determine if the null hypothesis was rejected.

For this research question, the high school graduating classes of 2014-2019 were used, which was 126 IB diploma candidates and 124 IB course candidates. For IB diploma candidates,

111 of 126 have graduated from college, which gives them a college graduation rate of 88.1%. All but one of the 124 IB course candidates enrolled in college within 2 years after high school graduation. For IB course candidates, 103 of 123 have graduated from college, which gives them a college graduation rate of 83.7%. Figure 7 shows the selectivity of the top 10 most common colleges participants graduated from according to their College Board selectivity rating (College Board, 2023a).

Figure 7

Selectivity of the Most Common Colleges Graduated From

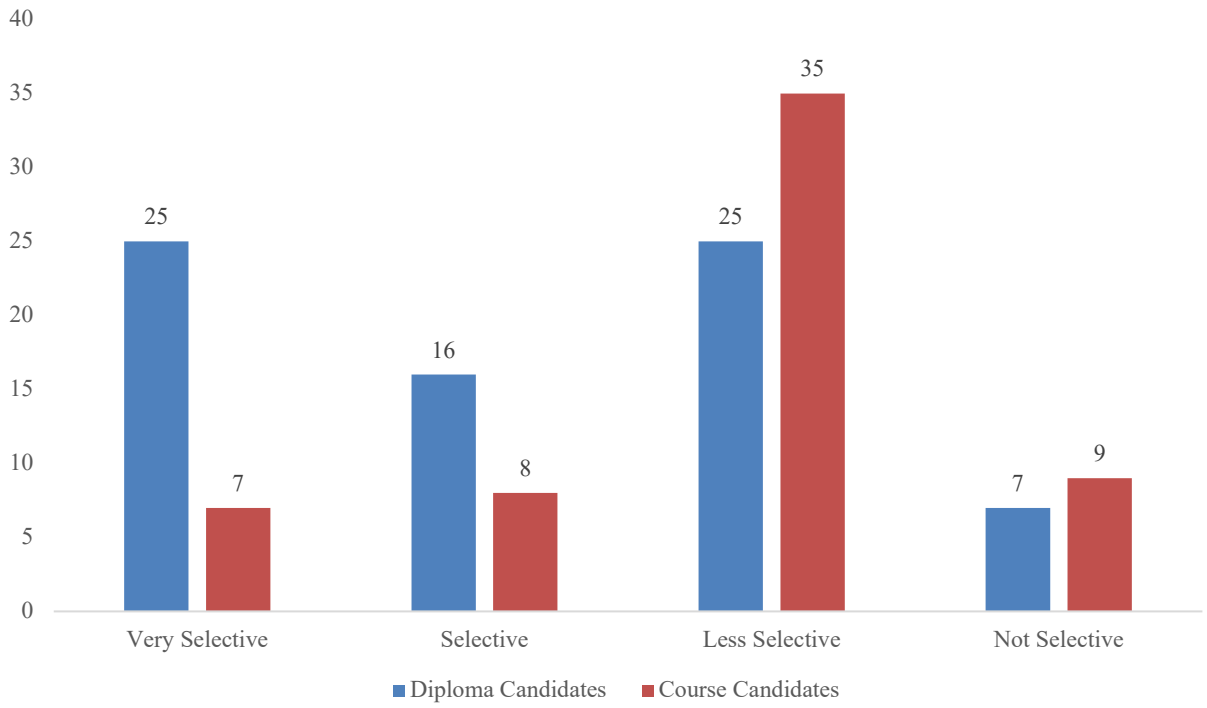


Table 14 presents the crosstabulation of level of participation in the IB program and college graduation rate. The Chi-square, $\chi^2(1, N = 249) = .977$, $p = .323$, test of association

indicated that there is no relationship between the variables. Since *p* (.323) was greater α (.05), the data failed to reject the null hypothesis. This means that, while IB diploma candidates have a higher graduation rate, it is not a statistically significant difference. The Phi coefficient of .063 further supports that there is no relationship or a negligible relationship between the variables.

Table 14

Crosstabulation for College Graduation

IB Status	Counts	Not Graduated	Graduated	Total
Diploma	Count	15	111	126
	Expected Count	17.7	108.3	126
	% Within Graduated	42.9%	51.9%	50.6%
Course	Count	20	103	123
	Expected Count	17.3	105.7	123
	% Within Graduated	57.1%	48.1%	49.4%
Total	Count	35	214	249
	Expected Count	35	214	249
	% Within Graduated	100%	100%	100%

Note. IB = International Baccalaureate

Time to College Graduation

A t-test for independent samples was used to compare the time to college graduation. The null hypothesis (H_0) for this question was that there is not a statistically significant difference between the time to college graduation of IB diploma candidates and IB course candidates. The

alternate hypothesis (H_1) was that there is a statistically significant difference between the time to college graduation of IB diploma candidates and IB course candidates. A *p* value of less than .05 was used to determine if the null hypothesis was rejected.

As mentioned previously, 111 IB diploma candidates graduated from college and 102 IB course candidates graduated from college. Most of those graduates graduated in 4 years: 90 IB diploma candidates (81%) and 74 IB course candidates (73%). The average time to college graduation for IB diploma candidates was 4.09 years. For IB course candidates, the average time to college graduation was 4.05 years. See Table 15 for standard deviation, minimum time to graduation, and maximum time to graduation for each group.

Table 15

Time to College Graduation Group Statistics

IB Status	*M*	*N*	*SD*	Min.	Max.
Diploma	4.09	111	.421	2.5	6
Course	4.05	102	.465	2	5.5

Note. IB = International Baccalaureate

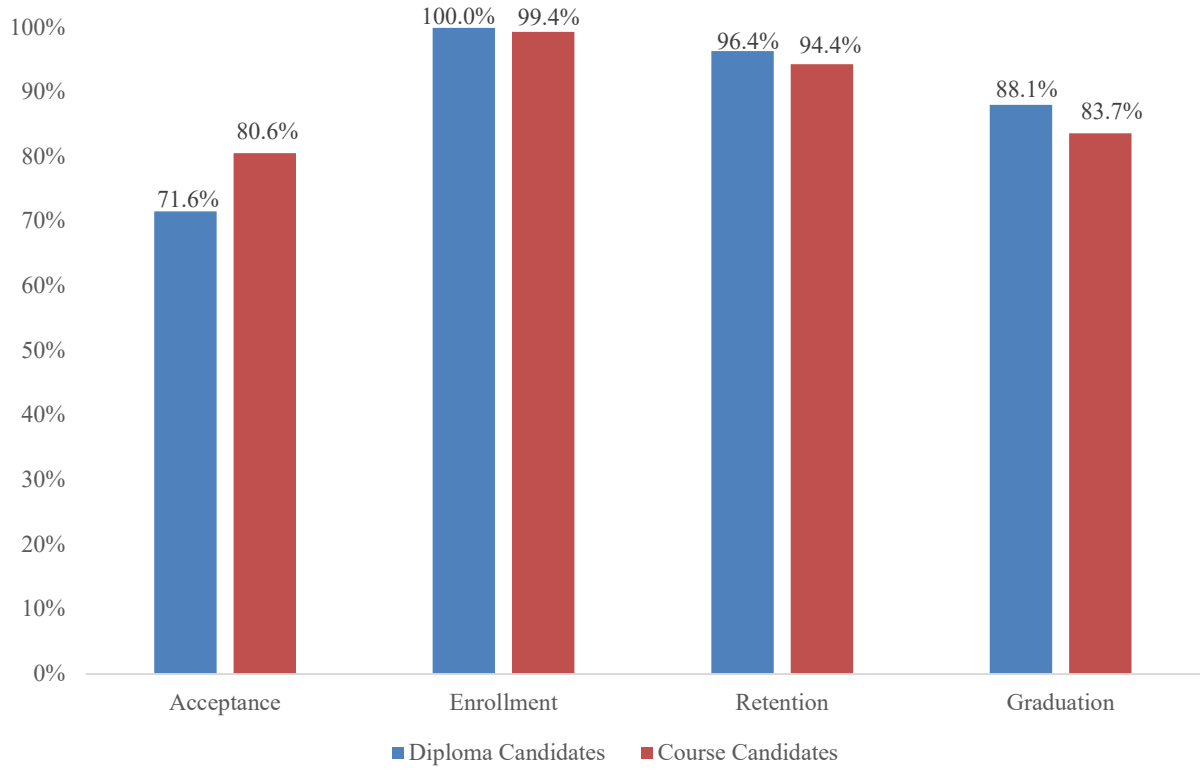
The results of the t-test for independent samples, $t(211) = .754$, $p = .804$, indicated that there is not a statistically significant difference in the time to college graduation of IB diploma candidates and IB course candidates. Since *p* (.804) was greater than α (.05), the data failed to reject the null hypothesis. Though IB course candidates graduate from college slightly faster than diploma candidates, the difference is not statistically significant. The effect size was small (Cohen's $d = .103$).

Summary of Findings

This study sought to compare the college success outcomes of IB diploma candidates and IB course candidates. I compared five college success outcomes: acceptance, enrollment, retention, graduation, and time to graduation. Figure 8 shows the results of the first four of those outcomes.

Figure 8

College Acceptance, 2-Year Enrollment, Retention, and Graduation Rates



A *t*-test for independent groups indicated that there was a statistically significant difference between the college acceptance rate of IB diploma candidates and IB course candidates. IB course candidates had an 80.6% college acceptance rate while IB diploma

candidates had 71.6%. Fisher's exact test indicated that there was not a relationship between IB status and immediate college enrollment, 1-year college enrollment, and 2-year college enrollment. In the fall immediately after high school graduation, 97.2% of IB diploma candidates and 97.8% of IB course candidates enrolled in college. Within one year after high school graduation, 98.9% of IB diploma candidates and 98.3% of IB course candidates enrolled in college. Within two years after high school graduation, 100% of IB diploma candidates and 99.4% of IB course candidates enrolled in college.

A Chi-square test indicated that there was not a statistically significant relationship between IB status and college freshman-to-sophomore retention rate. IB diploma candidates had 96.4% retention rate while IB course candidates had a 94.4% retention rate. IB diploma candidates had an 88.1% graduation rate and IB course candidates had an 83.7% college graduation rate. While diploma candidates had a slightly higher graduation rate, the Chi-square test indicated that this difference is not statistically significant. The average time to college graduation was 4.09 years for IB diploma candidates, while it was 4.05 years for IB course candidates. The t-test for independent samples indicated that there was not a statistically significant difference in the graduation rates of IB diploma candidates and IB course candidates.

The findings of this study are that IB course candidates had a higher college acceptance rate than IB diploma candidates. There was not a statistically significant difference between the college enrollment rate, retention rate, graduation rate, or time to graduation of IB diploma candidates and course candidates.

CHAPTER 5

RECOMMENDATIONS

The IB program is an international college-preparatory program for high school juniors and seniors. Several research studies show that IB students are more likely to enroll in college, attend a selective college, have higher college GPAs, and graduate from college at higher rates than non-IB students (Coca et al., 2011; Gordon et al., 2015; Pilchen et al., 2019). However, there are few studies that differentiate between the two levels of participation in the IB program: being a full IB diploma candidate and being an IB course candidate. IB diploma candidates must take IB courses in all six IB subject areas as well as complete the IB course components, which include an extra course on epistemology, writing a research paper, and completing community service activities. IB course candidates take one or more IB courses. At the study site, IB diploma candidates have one less study hall period than other students, in addition to the extra work and stress that comes with taking six IB courses. It has long been the assumption of many in the school community that the extra work and stress of being an IB diploma candidate is worth it because it will lead to better college success outcomes. However, prior to this study, no research had been done to determine if this assumption is accurate. It is important to know whether this assumption is accurate when students and their families are deciding the level of participation that they will have in the IB program. Therefore, the purpose of this evaluation was to determine if there is a difference in college-related outcome achievement between IB diploma candidates and IB course candidates.

To find out if there is a difference in the college success of IB diploma candidates and IB course candidates, this study in large part replicated J. C. Hill's 2013 study. Depending on the range of years relevant to each question, the data came from the high school graduating classes of 2014-2022. The evaluation questions are:

1. To what extent do college acceptance rates differ between IB diploma candidates and IB course candidates?
2. To what extent do college enrollment rates differ between IB diploma candidates and IB course candidates…
    a. in the fall immediately after high school graduation?
    b. within the first year after high school graduation?
    c. within the second year after high school graduation?
3. To what extent do college freshman-to-sophomore retention rates differ between IB diploma candidates and IB course candidates?
4. To what extent do college graduation rates differ between IB diploma candidates and IB course candidates?
5. To what extent does time to college graduation differ between IB diploma candidates and IB course candidates?

To answer these questions, data was collected from college counseling records and the National Student Clearinghouse (NSC). Using the high school graduating classes of 2014-2022, there were 356 total participants in the sample: 178 IB diploma candidates and 178 IB course candidates. T-tests for independent samples were used to compare college acceptance rates and time to college graduation. Fisher's exact test was used to compare college enrollment rates. Chi-square tests were used to compare college retention rates and college enrollment rates.

This chapter begins with a summary of the major findings for each research question, followed by a discussion of those findings. Next are the recommendations for changes to policy and practice based on the findings. Finally, there are suggestions for future research and a summary of this entire study.

Summary of Major Findings

This section presents a summary of the major findings for each evaluation question. In order to answer the evaluation questions, a matched sample of IB diploma candidates and IB course candidates was made based on unweighted GPA. The high school graduating classes of 2014-2022 were used for this study, which included 265 diploma candidates and 505 course candidates. Students whose data was not available in NSC, students who had incomplete college acceptance data, students who did not apply to college, and IB course candidates who participated in one or more of the IB core components were removed from eligibility to be included in this study. That left 252 IB diploma candidates and 432 IB course candidates eligible to be included. When matching the students based on unweighted GPA, 154 exact matches were able to be made. I then made 24 close matches, with 12 where the IB course candidate's GPA was within .05 points lower than the IB diploma candidate and 12 where the IB course candidate's GPA was within .05 points higher than the IB diploma candidate. This brought the total sample to 356 students, with 178 in each group.

College Acceptance Rate

The full sample of 356 participants was used to answer this question. It was found that IB diploma candidates applied to an average of 5.84 colleges and were accepted into an average of 3.76 colleges, with an overall college acceptance rate of 71.6%. IB course candidates applied to an average of 5.52 colleges and were accepted into an average of 4.03 colleges, with an overall

acceptance rate of 80.6%. IB course candidates had a higher college acceptance rate than IB diploma candidates. A t-test for independent samples, $t(354) = -3.869$, $p = <.001$, indicated that this difference was statistically significant, with a medium effect size (Cohen's $d = -.410$).

College Enrollment Rate

The full sample of 356 participants was also used to answer this question. The first part of this question compared the college enrollment rate in the fall immediately after high school graduation. The second part of this question compared the college enrollment rate within 1 year of high school graduation, and the third part of the question looked at the college enrollment rate within 2 years after high school graduation. It was found that 173 IB diploma candidates and 174 IB course candidates enrolled in college in the fall immediately after high school graduation. Within 1 year of high school graduation, three more IB diploma candidates and one more IB course candidate enrolled in college, bringing the total enrolled in college for each group to 176 and 175 respectively. Two more IB diploma candidates enrolled in college within 2 years of high school graduation, giving IB diploma candidates an overall college enrollment rate of 100%. Two more IB course candidates enrolled in college within 2 years of high school graduation, giving IB course candidates an overall college enrollment rate of 99.4%.

The intention was to use a Chi-square test to compare the college enrollment rates of IB diploma candidates and IB course candidates. However, for all three parts of this question, there was at least one expected value cell that contained a value less than five. This means that the assumptions for a valid Chi-square test was not met, and Fisher's exact test was used instead (Agresti, 2007). This test indicated that there was not a relationship between IB status and immediate college enrollment ($p = 1$), 1-year college enrollment ($p = .623$), and 2-year college enrollment ($p = 1$).

Freshman-to-Sophomore Retention Rate

For this question, the high school graduating classes of 2014-2021 were used, which included 166 IB diploma candidates and 162 IB course candidates. All 166 IB diploma candidates in the sample enrolled in college and 160 of them returned for a second year, which gives them a retention rate of 96.4%. Of the 162 IB course candidates in the sample, 161 of them enrolled in college. Of those 161 who enrolled in college, 152 returned for a second year, giving IB course candidates a 94.4% college freshman-to-sophomore retention rate. IB diploma candidates have a slightly higher retention rate than IB course candidates. However, the Chi-square, $\chi^2(1, N = 327) = .729$, $p = .393$, test of association indicated that there was not a statistically significant relationship between IB status and college freshman-to-sophomore retention rate.

College Graduation Rate

The high school graduating classes of 2014-2019 were used to answer this question, which was a total of 126 IB diploma candidates and 124 IB course candidates. All 126 IB diploma candidates and 123 of the IB course candidates enrolled in college. For IB diploma candidates, 111 of the 126 have graduated from college. For IB course candidates, 103 of the 123 have graduated. IB diploma candidates had an 88.1% graduation rate and IB course candidates had an 83.7% college graduation rate. Although IB diploma candidates had a slightly higher graduation rate, the Chi-square, $\chi^2(1, N = 249) = .977$, $p = .323$, test indicated that this difference is not statistically significant.

Time to College Graduation

The 111 IB diploma candidates and 102 IB course candidates from the high school graduating classes of 2014-2019 who graduated from college were used to answer this question.

The average time to college graduation for IB diploma candidates was 4.09 years, while it was 4.05 years for IB course candidates. So, while IB course candidates took slightly less time to graduate from college than IB diploma candidates, the t-test for independent samples, $t(211) = .754$, $p = .804$, indicated that this difference was not statistically significant.

Discussion of Findings

In this section, I discuss the findings for each research question. I compare my findings to those found in the literature presented in the literature review. First is the discussion of the findings on college acceptance rates, followed by enrollment rates, retention rates, graduation rates, and time to college graduation.

College Acceptance Rates

The t-test for independent samples conducted for this study showed that IB course candidates have a higher college acceptance rate than IB diploma candidates, and that this difference is statistically significant. This is an interesting and unexpected finding for several reasons. First, it conflicts with the assumptions of members of the Evergreen School community that IB diploma candidates would have a higher college acceptance rate. Second, it seems conflict with what is reported to be valued in college admissions decisions. Two of the most important factors in college admissions decisions are high school GPA and taking college-preparatory classes like AP and IB classes (Claybourn, 2022; College Board, 2023b). According to the National Association for College Admission Counseling (2023), the three most important factors in college admissions decisions are grades in college preparatory classes, overall GPA, and having a rigorous course of study in high school. Both groups took a similar number of AP courses, with IB diploma candidates taking an average of 1.7 and IB course candidates taking an average of 1.9. However, the IB diploma candidates in this study took more IB courses than IB

course candidates; they took an average of 6.26 and 2.61 IB courses respectively. They also took more IB Higher Level (HL) courses than IB course candidates, with an average of 3.53 HL courses for IB diploma candidates and 1.35 for IB course candidates. So not only were IB diploma candidates enrolled in more college preparatory courses, but they also had a more rigorous program of study. Additionally, IB diploma candidates had a higher average weighted GPA than IB course candidates: 4.36 and 4.01 respectively. This is notable because Evergreen School only reports weighted GPA on the transcripts sent to colleges.

One potential explanation for this finding is that IB diploma candidates seem to have applied to institutions that are more selective than IB course candidates. For example, of the 36 applications to Ivy League schools, 31 of them were from IB diploma candidates. The selectivity of the top 10 colleges that each group applied to was examined. IB diploma candidates submitted 234 applications to "very selective" colleges, while IB course candidates submitted 74 (College Board, 2023a). There were 68 IB diploma candidates that applied to "selective" colleges, as opposed to 27 IB course candidates (College Board, 2023a). While it was beyond the scope of this study to examine the selectivity of all of the schools that participants applied to, these initial findings seem to indicate that IB diploma candidates were more likely to apply to more selective schools. Perhaps this could be an explanation for the reason that the overall acceptance rate of IB diploma candidates is lower than that of IB course candidates.

Overall, though, the acceptance rates of both groups were high. IB diploma candidates had an acceptance rate of 71.6% and IB course candidates had one of 80.6%. This means that the overall college acceptance rate of all the IB students in the sample was 76.1%. In other words, the IB students from Evergreen School were accepted into three out of every four colleges they applied to. This supports the findings in the qualitative literature that IB students believe that

participating in the IB program improves their chances of being accepted into college (Culross & Tarver, 2011; Dickson et al., 2018; Grose & Sanchez, 2021; Mayer, 2010). It also supports the qualitative findings that universities view the IB program positively (Coates et al., 2007; Jenkins, 2003; Fitzgerald, 2017) and are interested in accepting IB students (Culross & Tarver, 2011; I. Hill & Saxton, 2014).

College Enrollment Rates

The Fisher's exact test did not reveal a statistically significant difference in the college enrollment rate of IB diploma candidates and IB course candidates, whether it was measured in the fall immediately after high school graduation, within the first year after high school graduation, or within 2 years after high school graduation. Although there was not a difference found between the groups, the enrollment rate of the participants in the sample was high. In the fall after high school graduation, 347 of the 356 participants enrolled in college. This is an overall immediate college enrollment rate of 97.5%. The overall 1-year enrollment rate was 98.6% and the overall 2-year enrollment rate was 99.7%. All but one participant in the sample enrolled in college within 2 years. Evergreen School is a college preparatory school, so these high enrollment numbers indicate that the school is preparing its students to enroll in college. This is especially apparent when compared to the national average college enrollment rate of 18- to 24-year-olds that was 38–41% during the time of this study (National Center for Education Statistics, 2023a).

The findings that there is not a statistically significant difference between the college enrollment rates of IB diploma candidates and course candidates differ from other studies that compared the two groups on college enrollment (J. C. Hill, 2013; Pilchen et al., 2013). They found that IB diploma candidates had higher college enrollment rates than IB course candidates.

However, since selection bias was not accounted for in either of these studies, these findings must be used with caution.

Though beyond the scope of this study, these findings seem to support the findings that IB diploma candidates enroll in more selective colleges than IB course candidates (Pilchen et al., 2019). I examined the selectivity of the top 10 colleges each group enrolled; 33 IB diploma candidates enrolled in "very selective" colleges, as opposed to 17 IB course candidates (College Board, 2023a). There were 28 IB diploma candidates who applied to "selective" colleges, while there were 10 IB course candidates (College Board, 2023a). Again, further research would need to be done to answer this question fully.

Freshman-to-Sophomore Retention Rates

The Chi-square test did not indicate that there was a difference in the freshman-to-sophomore retention rate of IB diploma candidates and IB course candidates. Again, though, the retention rate of the overall sample was high, with 312 of the 328 participants returning to college for a second year. That is an overall retention rate of 95.1%. So, while these findings do not indicate that level of participation in the IB program has an effect on college retention rate, they do reflect highly on the overall retention rate of Evergreen School's IB students. The college retention rate of the sample of this study is higher than the national average retention rate of students who enrolled in a college that reports data to NSC, which was between 81% to 83% during the time of this study (NSC, 2023).

While this study did not compare IB students to non-IB students, it seems to support the findings that IB students have higher retention rates than non-IB students since the retention rate was higher than the national average (Coca et al., 2011; Conley et al., 2014; Pilchen et al., 2019). My findings contradict one study which found that IB diploma candidates have higher one- and

2-year retention rates than IB course candidates (Pilchen et al., 2019). These findings likely differ from mine because those researchers did not account for selection bias in their methodology. Therefore, IB diploma candidates, who would likely have qualities that would lead them to being more successful in college, of course have a higher retention rate in that study. When the groups are matched, it accounts for those differences, which shows that the level of participation in the IB program does not have a relationship to college retention rates.

College Graduation Rates

The Chi-square test did not indicate that there was a difference in the college graduation rate of IB diploma candidates and IB course candidates. However, the sample as a whole had a high college graduation rate. Of the 249 participants who enrolled in college, 214 of them graduated. This means that the overall graduation rate for the sample was 85.9%. Just as with college enrollment and retention, these findings indicate that the IB students of Evergreen School are successfully graduating from college. The national average graduation rate is 64%, which is much lower than the 86% graduation rate in this study (National Center for Education Statistics, 2023b). Again, while it was beyond the scope of this study to compare IB students to non-IB students, these findings indicate that IB students are graduating at higher rates when compared to the national average.

These findings support the perceptions of IB students reported in the qualitative literature, which include that IB students believe the IB program prepares its students for college (Coca et al., 2011; Conley et al., 2014; Culross & Tarver, 2011; Grose & Sanchez, 2021; Hertberg-Davis & Callahan, 2008; Lee et al., 2014; Taylor & Porath, 2006) and that having participated in the IB program leads to success in college (Coca et al., 2011; Dickson et al., 2018; Mayer, 2010). These findings also seem to support those that IB students graduate at rates

higher than non-IB students (Pilchen et al., 2019; Shah et al., 2010). In looking at the literature comparing the graduation rates of IB diploma candidates and IB course candidates, these findings are similar to one study that also created a matched sample (Shah et al., 2010). Though they did not conduct a Chi-square test to determine statistical significance, they found that IB diploma candidates graduated at slightly higher rates than IB course candidates, which is what this study found. On the other hand, my findings differ from those of Pilchen et al. (2019), who found that IB diploma candidates have higher college graduation rates than IB course candidates. However, these researchers did not account for selection bias, which means that it is not possible to determine if the level of participation in the IB program is what affected graduation rates or simply the naturally occurring difference between the groups. The findings of these two studies and my study indicate that, when other characteristics are accounted for, there is not a relationship between level of participation in the IB program and college graduation.

Time to College Graduation

The t-test for independent samples did not indicate a statistically significant difference in the time to college graduation for IB diploma candidates and IB course candidates. But again, the time to graduation for Evergreen's IB students overall was good, with an overall time to graduation of 4.07 years. This indicates both that Evergreen School is delivering on its claim to be college preparatory and that the IB program prepares its students to succeed in college. The time to college graduation of Evergreen's IB students is better than the national average of students from colleges that report data to NSC, which is 5.1 years (Shapiro et al., 2016). When compared to the national average, Evergreen's IB students are taking 1 less year to graduate. This is of practical importance to some students and their families because that means they are paying 1 less year of tuition and have 1 more year to build their careers than some of their peers.

One potential reason for the faster time to graduation of the IB students in this study is that IB students are likely to receive college credit for strong performance on their IB exams (Byrd et al., 2007; Hertberg-Davis & Callahan, 2008; Kyburg et al., 2007; Mayer, 2010; Poelzer & Feldhusen, 1997).

Time to college graduation was not measured specifically in the literature on the IB program and college success outcomes that I reviewed for this study. Instead, they measured 4-year graduation rates. This study found that 81% of IB diploma candidates graduated in four years and 73% of IB course candidates graduated in 4 years. It was beyond the scope of this study to conduct tests for statistical significance on 4-year graduation rates, but it can be seen that more IB diploma candidates graduated in 4 years than course candidates. These findings support those of other studies that found that IB diploma candidates have higher 4-year college graduation rates than IB course candidates (Pilchen et al., 2019; Shah et al., 2010).

One potential explanation for there not being a statistically significant difference between the IB diploma candidates and IB course candidates of Evergreen School on college enrollment rate, retention rate, graduation rate, and time to graduation is that the IB program is woven into the policies, practices, and curriculum of the entire school. The IB skills and philosophy are an essential part of the identity of Evergreen School, permeating many aspects of the school's culture. So, while the IB program technically occurs in a student's junior and senior year, there is a tacit curriculum being taught to all students that emanates from the identity of being an IB World School. This means that all students indirectly participate in the IB program simply by being a student at Evergreen School. This could be a potential explanation for the lack of statistically significant differences on college enrollment, retention, graduation, and time to graduation between IB diploma candidates and IB course candidates.

Implications for Policy and Practice

In this section, I discuss the implications of this study's findings as they relate to policy and practice. There are six recommendations based on the findings. The first is to continue to offer both levels of participation in the IB program. The second is to continue to allow students to choose what level of participation they have in the IB program, as well as to encourage students to participate in the IB program. Another recommendation is to qualify more students for participation in the IB program in two ways. The first way to qualify more students for the IB program is to improve vertical alignment of pre-IB and IB courses. The second way to qualify more students for the IB program is to create a remediation program for students who are interested in taking IB courses or pursuing the full IB diploma, but do not yet have the skills necessary to earn the teacher recommendations to enroll in those IB courses. The final recommendation is to analyze to a greater extent the data that the school already collects to inform decision-making.

Offer Both Levels of IB Participation

The first recommendation based on this research study is to continue to offer both levels of participation in the IB program. The driving question of this study was whether it was worth it to pursue the full IB diploma if a student could have the same college success outcomes by taking IB courses. The findings of this study show that students who participate in the IB program have high college success outcomes, whether they were IB diploma candidates or IB course candidates. While some may believe that these findings indicate that it is not worth it to be an IB diploma candidate, looking at the findings more closely reveals that there are additional benefits to being an IB diploma candidate. Though further investigation needs to be done to

confirm, the findings of this study indicate that IB diploma candidates are more likely to apply to, be accepted into, and enroll in selective colleges.

Additionally, the qualitative literature shows that there are many benefits to being a full IB diploma candidate beyond getting into college and graduating from college, such as developing communication skills (I. Hill & Saxton, 2014) and time management skills (Coca et al., 2011; Conley et al., 2014; Dickson et al., 2018; Hertberg-Davis & Callahan, 2008; Lee et al., 2014). IB diploma candidates are also able to fully experience the other educational benefits of the IB program. One of these benefits is the program's aim of developing students that are "internationally minded," which means that they recognize "their common humanity and shared guardianship of the planet" and work to "create a better and more peaceful world" (IBO, 2015, p. 8). Another of these benefits is the development of attributes that contribute to international mindedness, which are captured in the IB Learner Profile (IBO, 2015). These attributes are for IB students to be "inquirers, knowledgeable, thinkers, communicators, principled, open-minded, caring, risk-takers, balanced, and reflective" (IBO, 2015, p. 8). Being internationally minded and embodying the attributes of the Learner Profile are outcomes of the IB program that last beyond college and serve students in their careers and lives.

Because IB students have high college success outcomes regardless of their level of participation and because there are some additional benefits to being an IB diploma candidate beyond college, both options for participating in the IB program should continue to be offered. Students and their families can make the decision that is best for them based on what they are hoping to get out of participating in the IB program.

Continue to Allow Students to Choose

The second recommendation is to continue to allow students to choose their level of participation in the IB program. Currently, as long as they have the teacher recommendations necessary to enroll in IB courses, students are allowed to choose their level of participation in the IB program. This practice should continue since there is little difference between IB diploma candidates and IB course candidates on four of the five college success outcomes measured in this study. Some students feel pressure from their parents to be full IB diploma candidates. However, there is not a reason to pressure students to become full IB diploma candidates when they would have similar colleges success outcomes as IB course candidates. On the other hand, there is not a reason to deter students from choosing to take on the additional challenge of pursuing the full IB diploma if they want to since IB diploma candidate also have high college success outcomes. Additionally, the initial exploration into the selectivity of the colleges suggests that that IB diploma candidates are accepted into and enroll in more selective colleges than IB course candidates. If college selectivity is important to a student and their family, they should have the option to choose to be IB diploma candidates. Having the knowledge that college outcomes are similar for all IB students gives students and their parents the information they need to make the important decision of determining the extent to which they will participate in the IB program.

Encourage Students to Participate

The third recommendation is to encourage students to participate in the IB program because the research done as part of this study indicates that participating in the IB program will lead to better college success outcomes. Studies found that IB students are more likely to be accepted to college (Kyburg et al., 2007); enroll in college (Coca et al., 2011; Gordon et al.,

2015; Pilchen et al., 2019); stay in college (Coca et al., 2011; Conley et al., 2014; Pilchen et al., 2019; Resnik, 2019); and graduate from college (Pilchen et al., 2019; Shah et al., 2010). Although I did not compare IB students to non-IB students, my findings indicate that IB students have high college success outcomes. Evergreen School currently encourages students to participate in the IB program through the admissions process, informational sessions, and conversations with teachers and other staff members. Now, the college success outcomes of Evergreen's IB students can be included in these discussions and promotional materials to encourage more students to participate in the IB program, whether as full IB diploma candidates or as IB course candidates. I found that IB course candidates essentially have the same college success outcomes as IB diploma candidates, so this option of participating in the program should be marketed more heavily. Students benefit from participating in the IB program even if they do not undertake the full IB diploma.

Qualify More Students

The fourth recommendation is to qualify more students for the IB program by improving their chances of earning the teacher recommendations necessary to enroll in IB courses. At the study site, students must earn teacher recommendations to enroll in IB courses. Students wishing to be IB diploma candidates need to earn IB recommendations in all six subject groups. If a student only has recommendations in five of the six subject groups, the IB Coordinator can override the non-IB recommendation to give that student the opportunity to be an IB diploma candidate. Students wishing to take individual IB courses need to earn the recommendation in that subject group. There are at least two possible ways to qualify more students for IB courses. This can be done first by improving vertical alignment between pre-IB courses and IB courses.

Second, a remediation program can be created for students who want a teacher recommendation for an IB course, but do not have the skills necessary to earn that recommendation.

Improve Vertical Alignment. Improving vertical alignment between pre-IB and IB courses would develop IB skills in younger students, improve students' chances of earning recommendations for IB courses, and give students a stronger foundation in the skills they need to be successful in those IB courses. Ideally, all pre-IB teachers would be sent to IB training every 5 years just like IB teachers so that they know the IB curriculum and assessment model for their subject. Then, pre-IB and IB teachers would meet periodically to collaborate to ensure that IB skills are being developed in the pre-IB classes. They would work together to discuss strengths and weaknesses of the students currently in the IB class to develop activities and assessments to improve those skills in the current pre-IB students. If the students have a stronger foundation, they are more likely to earn the recommendation to take the IB class, which grants them access to the high college success outcomes of IB students.

Create a Remediation Program. Another way to qualify more students to participate in the IB program is to create a remediation program for students who want to take an IB course or be a full IB diploma candidate, but do not have the skills necessary to earn the teacher recommendation to sign up for a class. This would allow more students to participate in the IB program, which would grant them access to its college benefits. Though there is little research on remediation programs specifically for the IB program, research shows that remediation programs for at-risk students and students with learning challenges improve student academic performance and helps them to develop skills and strategies to use in class (Chappell et al., 2015; Hock et al., 2001; Oreopoulos et al., 2017). Data would need to be collected on which courses are most commonly desired by student and the least likely to earn a recommendation for before

implementing this program. It is recommended that the IB Coordinator create a committee of IB and pre-IB teachers to design what the IB remediation program would look like.

Analyze Data

The final recommendation is for Evergreen School to analyze the data it already collects to a greater extent to support or correct assumptions held by community members, as well as to better inform decision-making. The school collects and has access to a vast amount of data from sources such as its learning management system, IB records, and college counseling records. Some data analysis is already done by individual staff members for certain purposes. For example, the registrar uses the learning management system to calculate the top 10% of the graduating class; the college counseling team figures out the most common colleges Evergreen students applied to and went to; the IB coordinator compares Evergreen's scores on IB exams to the world averages. While all of these uses of data are worthwhile, they are so many more ways the school could use data to provide information to the community and to make more informed decisions about the IB program, college counseling, and other school programs.

Beyond the questions asked and answered as part of this study, there are many more about the IB and college that would be helpful for the school community to have answers to. There are particular universities that many Evergreen students and their families want to attend. There is an assumption that IB diploma candidates are more likely to get into those universities. It would be useful to analyze the data to find out the overall acceptance rate of Evergreen students at those universities, as well as whether or not IB diploma candidates are more likely to get into those universities. Similarly, seeing if there is a correlation between IB courses taken and acceptance at those universities would empower students and their families to make the best

decision for them. Another question about the IB program and college is the extent to which scores on IB exams correlate to college success outcomes.

There are also several AP courses offered at Evergreen School. It would help inform decision-making to analyze the college success of students who take only AP courses compared to those who take IB courses. Some students take both AP and IB classes, so it would also be useful to see how their college success outcomes compare to students who participate in only one of those programs.

Beyond the IB program, there are other questions about college that school community has that would be useful to analyze the data and find the answers to. For example, analyzing the college acceptance and college graduation rates of Evergreen students as a whole would be useful. Having a distribution of the college majors of Evergreen students could inform curricular decisions. Analyzing the college success outcomes of athletes and non-athletes could inform decisions made in the athletics department. Finally, looking at the outcomes of Evergreen's first-generation college students could indicate a need for more support for these students while still in high school.

Recommendations for Future Research

This study compared IB diploma candidates and IB course candidates on the college success outcomes of college acceptance, enrollment, retention, graduation, and time to graduation. There are several ways these findings could be expanded upon in future research. The first recommendation is to account for the selectivity of the colleges to which the students applied when calculating college acceptance rates. If a student is applying to many highly selective colleges, it is likely that their college acceptance rate will be lower. Conversely, if a student is applying to many non-selective colleges, it is likely that their college acceptance rate

will be higher. Statistically accounting for the selectivity of colleges the students applied to would allow for a more accurate comparison of the college acceptance rate of IB diploma candidates and IB course candidates. Furthermore, if IB students believe that participating in the IB program will gain them acceptance into prestigious colleges (Culross & Tarver, 2011; Hertberg-Davis & Callahan, 2008; Hertberg-Davis et al., 2006; Mayer 2010), including the selectivity of the universities applied to in data analysis could potentially support these qualitative findings.

In addition to examining the selectivity of the colleges IB diploma candidates and IB course candidates were accepted into, future research could also examine the selectivity of the colleges IB students enrolled in. While there are many factors that go into a student's decision of which college to enroll in beyond their level of participation in the IB program, it would still be useful for students and parents to know if either group is more likely to enroll at a selective institution when deciding what level of participation in the IB program they want to have.

Another suggestion for further research is to account for the rigor of the academic curriculum of the colleges when calculating retention, graduation, and time to graduation. In this study, it was found that there was not a statistically significant difference in the retention rate, graduation rate, and time to graduation of IB diploma candidates and IB course candidates. Could this be because IB diploma candidates attended schools that are known to be more academically challenging? Similarly, examining the student's choice of major could lead to interesting findings as they relate to retention, graduation, and time to graduation.

Comparing IB diploma candidates and IB course candidates on other quantitative measures of college success would also contribute to the body of knowledge on the IB program. These could include merit scholarships earned, college GPA, Latin honors, and being inducted

into Phi Beta Kappa. Examining who pursues graduate education and in what fields of study could also be useful quantitative measures to examine.

Another suggestion for further research is to conduct the present study on a larger scale. While the findings of this study are useful, they are limited because it examined 356 IB students from a specific context. In 2013, there were more than 37,000 students in the IB program in the United States (Pilchen et al., 2019) and that number has continued to grow exponentially since then (IBO, 2017, 2023). It would be interesting and useful to see what the findings would be if this study were conducted with an even larger sample from various contexts.

Comparing the co-curricular experiences of IB diploma candidates and IB course candidates is another suggestion for future research. Co-curricular experiences include school clubs, athletic teams, and activities done outside of school. Do IB diploma candidates participate in fewer co-curricular activities because of the demanding full IB diploma program? Are their co-curricular activities less enjoyable to them because of the stress they are under? Or do the reflections on co-curricular activities that they write to fulfill their IB CAS requirements make their co-curricular activities more meaningful to them?

The final suggestion for future research is to look at the impact of the IB program beyond college. The IB program claims that it "prepares students…for success at university and life beyond" (IBO, 2012, para. 1). This study examined quantitative ways the IB program delivers on the university part of that claim, but what about the life part of that claim? What careers do IB diploma candidates and course candidates have? Who makes more money? How do the skills the IB program teaches impact a student's career? Their personal lives? This is just the beginning of the questions that could be asked to investigate the impact of the IB program on its students beyond college.

Summary

The IB program is an international college preparatory program for high school juniors and seniors that offers two levels of participation: being an IB diploma candidate and being an IB course candidate. While an IB course candidate takes one or more IB classes, an IB diploma candidate takes six IB courses and completes the three IB core components. Research shows that IB students as a whole are more successful in college than non-IB students (Coca et al., 2011; Gordon et al., 2015; Pilchen et al., 2019). However, very few studies differentiate between IB diploma candidates and IB course candidates. At the site of this study, it has long been the assumption of many in the school community that IB diploma candidates have better college success outcomes than IB course candidates. This study was born out of both the gap in the literature and the lack of data to determine whether that assumption is true.

Data was collected from college counseling records and the National Student Clearinghouse. A matched sample of 356 students was created based on unweighted high school GPA to compare IB diploma candidates and IB course candidates on college acceptance rate, college enrollment rate, college retention rate, college graduation rate, and time to college graduation. It was found that IB course candidates have a higher college acceptance rate than IB diploma candidates; on the other four measures, there was not a statistically significant difference between the two groups.

Knowing that IB course candidates have essentially the same college outcomes as IB diploma candidates is important for teachers, administrators, students, and their parents when making decisions. This knowledge allows teachers to encourage students to participate in the IB program at whatever level of participation that student feels comfortable with. It allows administrators to enhance their marketing of the IB program with the fact that IB course

candidates are just as successful in college as IB diploma candidates. It allows parents to support the decision that their student makes about their own path in the IB program. Finally, it allows students to choose the extent to which they participate in the IB program not out of a perceived benefit when it comes to college, but based on what they want out of their high school experience.

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