

RESEARCH SUMMARY

High school student engagement among IB and non-IB students in the United States: A comparison study

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Abstract

In spring 2009, the IB recruited eight schools to participate in the High School Survey of Student Engagement (HSSSE). The HSSSE is a national survey measuring the academic, social, and emotional engagement of high school students. Two broad sets of analyses were conducted – the first compared non-IB students and IB students in the targeted sample of eight schools (n=7,692), and the second compared non-IB students and IB students in a national sample of more than 100 schools (n=42,754). In both sets of comparisons, IB students rated their levels of academic, behavioral, and emotional engagement significantly higher than non-IB students.

Background

Since 2004, Indiana University at Bloomington's School of Education¹ has administered the High School Survey of Student Engagement (HSSSE), a national survey measuring US high school students' academic, social, and emotional engagement. Since the survey's inception, over 500,000 students nationally have participated in the HSSSE.

The HSSSE offers teachers and administrators actionable information on school characteristics that shape student experience. In addition to demographic information, such as students' current grades, age, gender, and ethnicity, the survey provides detailed information about students' engagement across three dimensions: (i) Cognitive/Intellectual/Academic Engagement, (ii) Social/Behavioral/Participatory Engagement, and (iii) Emotional Engagement.

The HSSSE report defines *Cognitive/Intellectual/Academic Engagement* as "students' effort, investment, and strategies for learning," or "engagement of the mind." The second dimension, *Social/Behavioral/Participatory Engagement*, focuses on "students' actions in extracurricular, social, and non-academic school activities, including interactions with their fellow students as well as with other members of the school community. This dimension can be thought of as engagement in the life of the school." *Emotional Engagement* "emphasizes students' feelings of connection to their school. This dimension can be interpreted as engagement of the heart."

These dimensions of engagement are of particular relevance to the IB learner profile and to the aims of the IB Diploma Programme. IB programmes strive to develop students who are inquirers, knowledgeable, thinkers, communicators, principled, open-minded, caring, risk-takers, balanced, and reflective. The IB Diploma Programme encourages students to ask challenging questions, to learn how they learn, to make cross-curricular connections and to develop their creativity (i.e., effort, investment and strategies for learning). The Diploma Programme also values student involvement in areas outside the academic arena such as in arts, sports, and community service and encourages students to become active global citizens through their participation in social extracurricular and non-academic school activities.

School Demographics

In April 2009, the International Baccalaureate's Research Department sent an open invitation to 89 IB schools with an enrollment of 140 or more IB candidates to participate in the 2009 HSSSE administration. Participation in the study was limited to eight schools, and determined on a first-come, first-serve basis. The IB paid the required survey fees for participating schools.

¹ In 2005-2006, the Center for Evaluation and Education Policy at Indiana University began administering the HSSSE.

Schools ranged from large, comprehensive schools to small schools. Seven were public schools, and one was a private school. Table 1 provides an overview of the schools.

Table 1. IB Schools Participating in 2009 HSSSE

School	Status	IB Candidates (May 2008)	Total Students	% FRL	% Minority ²
School A	STATE	237	1544	53.9%	34.2%
School B	STATE	194	825	24.8%	31.3%
School C	STATE	411	2393	3.7%	13.6%
School D	STATE	151	470	9.2%	26.2%
School E	STATE	154	985	6.2%	40.4%
School F	STATE	287	1504	48.0%	76.2%
School G	PRIVATE	177	1585	0%	9.8%
School H	STATE	145	2113	34.0%	34.1%

The socioeconomic demographics of participating schools also represented a range – for example, the African-American population among schools ranged from .01% at one school to 61.6% at another school. Table 2 lists the participating schools and the breakdown of their student population, by race and ethnicity. Data are based on school reports.

Table 2. Student population, by race and ethnicity (2008-2009)³

School	Native American	Asian	Black	Latino	Middle Eastern	White	Other	TOTAL
School A	8 (.5%)	64 (4.1%)	368 (24.0%)	90 (5.9%)	0 (0%)	1014 (65.7%)	0 (0%)	1544
School B	1 (.2%)	17 (3.6%)	119 (24.9%)	27 (5.6%)	0 (0%)	313 (65.5%)	1 (.2%)	478
School C	4 (.2%)	193 (8.1%)	28 (1.2%)	103 (4.3%)	0 (0%)	2055 (85.9%)	10 (.4%)	2393
School D	0 (0%)	51 (10.9%)	28 (6.0%)	44 (9.4%)	0 (0%)	347 (73.8%)	0 (0%)	470
School E	3 (1%)	332 (33.7%)	28 (2.9%)	16 (1.6%)	23 (2.3%)	583 (59.2%)	0 (0%)	985
School F	10 (1%)	111 (7.4%)	926 (61.6%)	108 (7.2%)	0 (0%)	298 (19.8%)	51 (3.4%)	1504
School G	8 (.5%)	26 (1.6%)	11 (1.0%)	130 (8.2%)	0 (0%)	1005 (63.4%)	405 (25.6%)	1585
School H	8 (.4%)	196 (9.3%)	434 (20.5%)	90 (4.3%)	0 (0%)	1314 (62.2%)	71 (3.4%)	2113

² “Minority” students are defined as Native American, Asian, Black, Latino, and Middle Eastern. Specific breakdowns by school are provided in Table 2.

³ Percentages may not add up to 100, due to rounding

Similarly, the socio-economic composition, measured by the percent of students receiving free or reduced-price lunches, varied among schools. Table 3 shows the breakdown.

Table 3. Student population, by free and reduced-price lunch (2008-2009)

School	Participation in Free Lunch Program	Participation in Reduced-Price Lunch Program
School A	689 (44.6%)	143 (9.3%)
School B	120 (25.1%)	85 (17.8%)
School C ⁴	56 (2.4%)	31 (1.3%)
School D	28 (6.0%)	15 (3.2%)
School E	31 (3.1%)	31 (3.1%)
School F	512 (34.0%)	211 (14.0%)
School G	0 (0%)	0 (0%)
School H	580 (27.4%)	139 (6.6%)

Sample Demographics

To ensure that the survey results reflect a representative range of student experiences at the school, every effort was made to ensure full participation of each school's student population. Half of the schools had response rates above 80%. Table 4 shows the response rates and the percent of IB students who participated in the survey.

The survey sample, aggregated across the eight schools, consisted of 7,692 students. Of the sample, 3,499 were IB students (45%) and 4,193 were non-IB students (55%). Nationally, the HSSSE was administered to 42,754 students. Within the national sample, 16% of students were IB students (n=6,720). Students were classified as IB students based on their response to the following question: "Have done during high school: Taken one or more International Baccalaureate (IB) Diploma classes, or participated in the Middle Years Programme (MYP)."

⁴ School C data for free and reduced lunch participation are based on the 2007-2008 school year, not the 2008-2009 school year. 2007-2008 data were retrieved from: <http://nces.ed.gov/>.

Table 4. Survey response rates

School	Total Student Population	Number of Respondents	Response Rate	Number of IB Participants ⁵	% of IB students ⁶
School C	2393	1942	81%	953	52%
School F	1504	1223	81%	800	69%
School A	1544	1054	68%	374	43%
School B	478	350	73%	225	68%
School G	1585	1411	89%	294	22%
School E	985	725	74%	457	65%
School D	470	391	83%	151	41%
School H	2113	596	28%	245	47%
TARGETED SCHOOLS TOTAL	11072	7692	69%	3499	45%
NATIONAL SAMPLE TOTAL	57561	42754	74%	6720	16%

In the targeted sample of eight schools, 52% of non-IB students were female, while 48% were male. 55% of IB students were female and 45% were male. This was similar to the gender breakdown in the national sample.

The racial and ethnic breakdown of both the targeted and national samples, as reported by students on the survey, is provided in Table 5. The IB group had higher percentages of Black and Asian students in both samples, compared to the non-IB group.

Table 5. Self-reported race/ethnicity, targeted sample and national sample

Group	Native American	Asian	Black	Latino	Middle Eastern	White	No response	Multiracial
Targeted Sample								
IB students	1.11%	11.37%	12.23%	4.06%	2.31%	48.30%	9.89%	10.72%
Non-IB students	1.31%	6.32%	9.83%	4.63%	1.81%	47.48%	17.58%	11.04%
National Sample								
IB students	2.6%	9.03%	16.52%	6.06%	1.93%	40.30%	12.34%	11.22%
Non-IB students	1.63%	5.36%	11.75%	6.56%	.85%	51.64%	13.20%	8.99%

In both the targeted and national samples, large proportions of students did not report their eligibility for the free or reduced lunch program, a proxy for socio-economic status. With the

⁵ Number of IB participants is based on responses to question 16D, "Have you taken one or more International Baccalaureate Diploma classes, or participated in the Middle Years Programme?"

⁶ % of IB students is based on the number of respondents to Q16D on the survey asking about IB participation, not the overall student population. Thus, percents may over-estimate the proportion of IB students in the school.

high percentage of missing data, along with the self-report nature of these data, these data need to be interpreted cautiously.

In the targeted sample, 64% of IB students reported that they did not receive free or reduced lunch, compared to 58% of non-IB students. In the national sample, the percentage of students ineligible for the free/reduced lunch program was nearly identical.

Table 6. Self-reported eligibility for free and reduced lunch, targeted sample and national sample

Group	Eligible for FRL	Ineligible for FRL	DK/prefer not to answer
Targeted Sample			
IB students	17.79%	64.72%	17.49%
Non-IB students	19.29%	58.45%	22.26%
National Sample			
IB students	27.54%	53.64%	18.82%
Non-IB students	23.98%	54.47%	21.55%

Survey Development & Description

Based on the National Survey of Student Engagement (NSSE), a survey of college students and their ratings of student engagement, HSSSE was field tested with more than 7,200 high school students in 2003. The survey was revised and fine-tuned following focus groups with high school students and teachers. HSSSE is the largest national database of student engagement.

The survey taps into three broad dimensions of student engagement: 1) Cognitive/Intellectual/Academic Engagement, 2) Social/Behavioral/Participatory Engagement, and 3) Emotional Engagement.

Sample items from the **Cognitive/Intellectual/Academic Engagement** domain include:

- How many hours are spent in a typical week reading and studying for class?
- To what extent do teachers try to engage [you] in classroom discussions?
- How often have you worked on a paper or project that required you to do research outside of assigned texts?
- How often have you connected ideas or concepts from one class (or subject area) to another?

Items tapping into students' level of **Social/Behavioral/Participatory Engagement** include:

- How important is participating in school-sponsored activities to you?

- [To what extent does your] school emphasize participating in school events and activities?
- [To what degree has] school contributed to growth in gaining awareness of conditions in the community outside of school?

Items related to ***Emotional Engagement*** include:

- [To what extent do you] feel supported by the following people at this school: teachers, administrators, counselors, other students?
- [To what degree do] adults in this school want [you] to succeed?
- [To what degree has the] school contributed to growth in understanding yourself?
- [To what degree has the] school contributed to growth in treating people with respect?

Research Questions and Analytic Approach

The primary research question for the study was: **How do IB students rate their levels of student engagement, compared to non-IB students, both in the targeted sample of eight schools and the national sample?**

To address this question, the research team from Indiana University computed t-tests to assess whether or not there were statistically significant differences between the mean scores of IB students and non-IB students on the three broad dimensions of student engagement, as well as individual items. Effect sizes (Cohen's *d*) were also computed on the three subscales and the individual items to assess the magnitude of differences between the groups.⁷

In addition, the IB was interested in learning more about school-level effects, including (i) how IB and non-IB students within schools differ in their student engagement, and (ii) how the IB school, as a whole, compares to other similar schools. To address the former question, Indiana University conducted t-tests and effect sizes looking at IB students and non-IB students *for each school* in the targeted sample. For the latter question, Indiana University identified one or two matched comparison schools for each of the targeted schools, based on school size, the percent of FRL students, race/ethnic demographics, and the percent of honors students. Using these matches, t-tests and effect sizes were computed to ascertain differences between all students at an IB school against a demographically similar non-IB school.

⁷ Effect size indicates the practical significance of the mean difference between groups being compared. In educational research, it is most common to find effect sizes between 0.10 and 0.40. The following rubric for Cohen's *d* was used to interpret effect sizes: .20 - .49 = small effect size, .50 - .79 = medium effect size, and .80+ = large effect size.

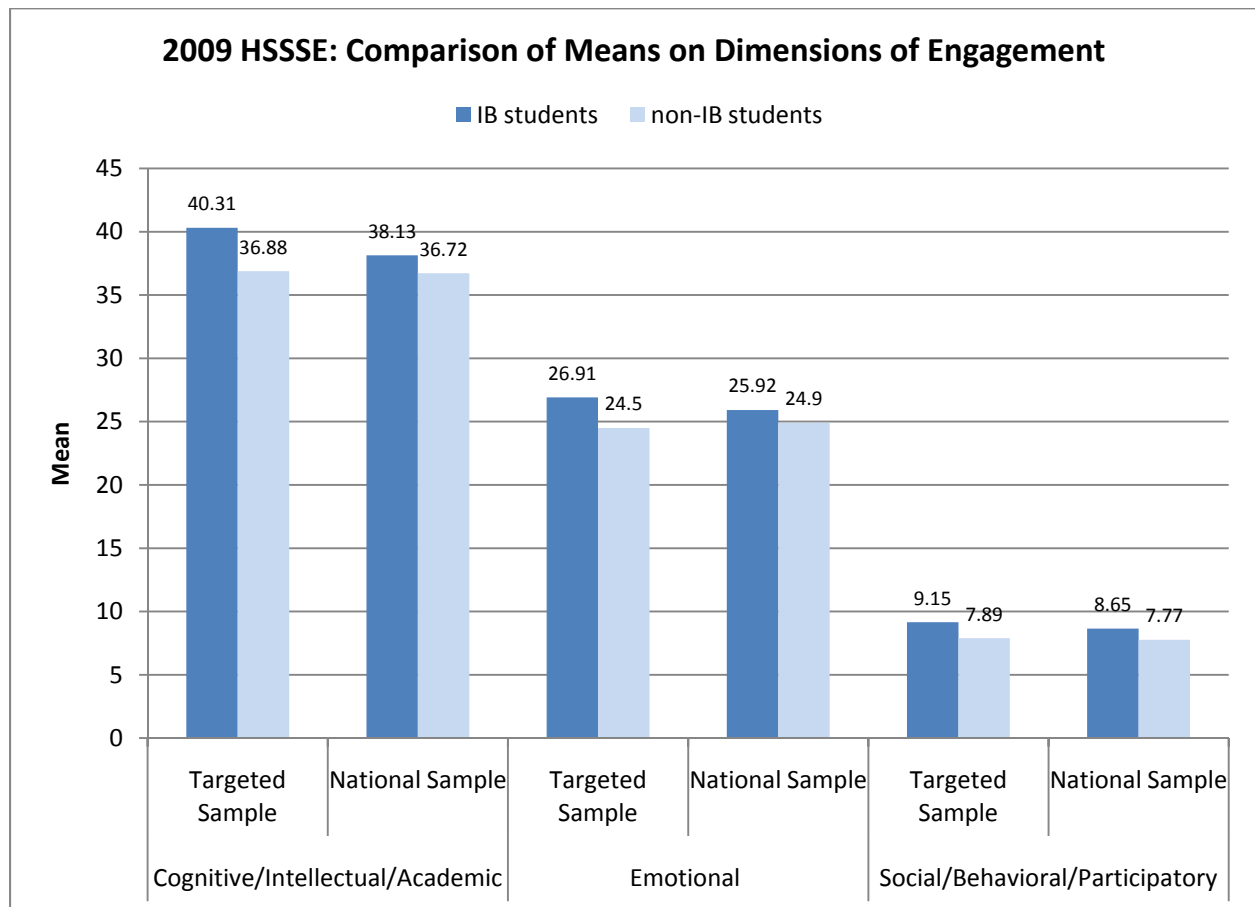
Results

Aggregated differences between IB and non-IB students, targeted and national sample

On each of the three broad dimensions of engagement, IB students reported higher levels of engagement in both the targeted sample of eight schools, as well as the national sample. In each set of comparisons, the difference between IB students and non-IB students was statistically significant at $p = .00$ level.

Small effect sizes were observed in the targeted sample, and the strongest effect size was found for Social/Behavioral/Participatory Engagement (Cohen's $d = .48$), followed by Cognitive/Intellectual/Academic Engagement (Cohen's $d = .42$), and Emotional Engagement (Cohen's $d = .41$).

In the national sample, a small effect size was found for Social/Behavioral/Participatory Engagement (Cohen's $d = .33$). Effect sizes for Emotional Engagement (Cohen's $d = .17$) and Cognitive/Intellectual/Academic Engagement (Cohen's $d = .16$) were negligible.



Within-school differences between IB students and non-IB students

Examining within-school differences allows us to understand the extent to which the experience of IB students within a school is distinct from non-IB students within the same school. At all of the targeted schools, in each of the dimensions, IB students rated their level of student engagement higher than non-IB students at the same school. The effect seemed to be bigger in schools with larger student populations. Looking at raw numbers, it is interesting to note that students at School E, which expects all students to complete the IB curriculum, rate their level of Cognitive/Intellectual/Academic Engagement especially high.

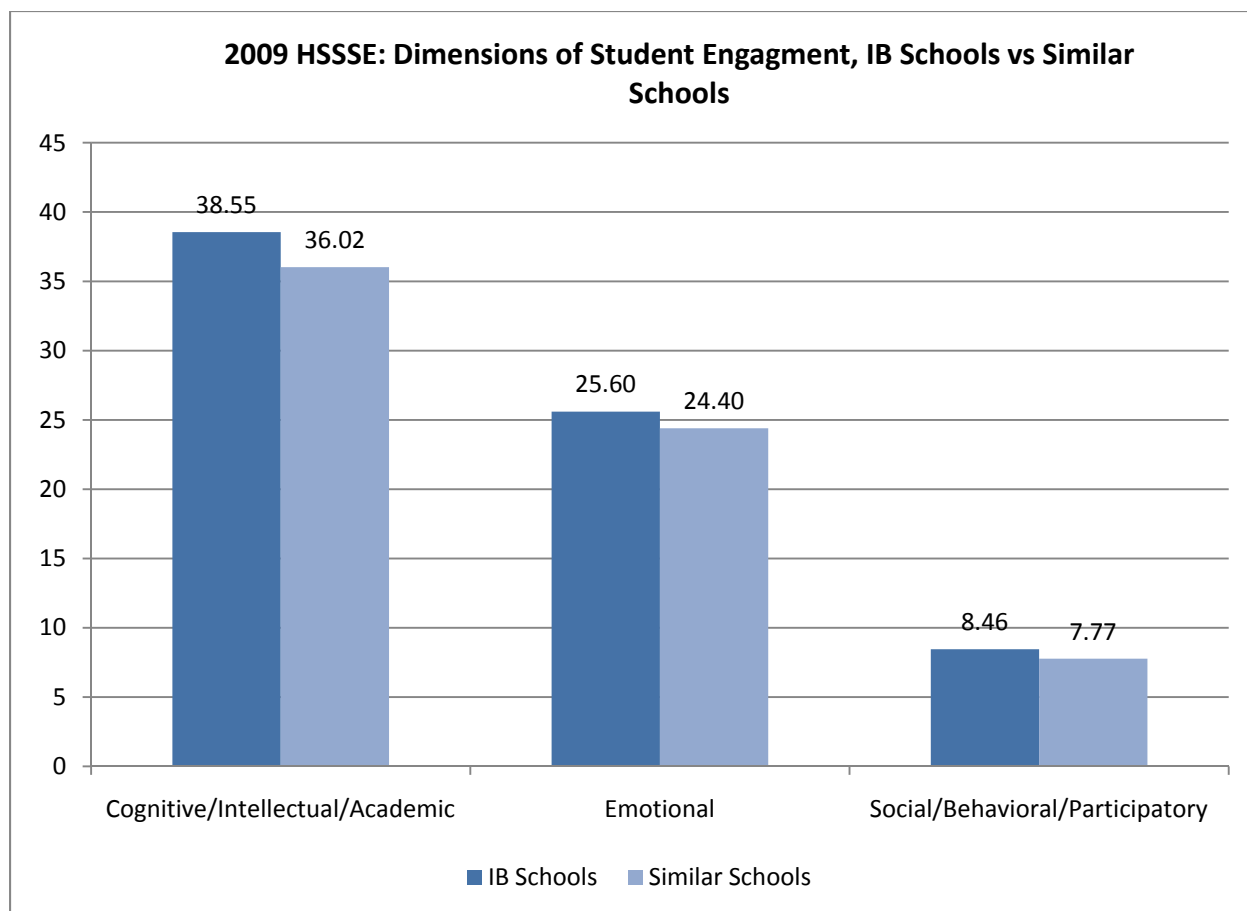
Table 7. Within-school ratings of student engagement

School	Cognitive/Intellectual/ Academic		Emotional		Social/Behavioral/ Participatory	
	Mean of IB students	Effect Size	Mean of IB students	Effect Size	Mean of IB students	Effect Size
School A	39.10	0.34	26.71	0.57	9.03	0.69
School B*	40.54	N/A	26.74	N/A	9.43	N/A
School C	39.70	0.56	26.34	0.43	9.11	0.51
School D	36.68	0.29	25.26	0.38	8.11	0.28
School E*	43.18	N/A	28.18	N/A	9.28	N/A
School F	40.61	0.40	27.28	0.42	9.26	0.68
School G	40.49	0.32	27.18	0.26	9.61	0.27
School H	39.86	0.54	26.72	0.47	8.69	0.80
NATIONAL SAMPLE	38.13	0.16	25.92	0.17	8.65	0.33

*Effect sizes are not reported because non-IB students are primarily 9th and 10th graders, virtually all students participate in IB in 11th and 12th grades.

School-level differences between IB schools and demographically similar schools

Anecdotally, some principals and teachers state that the presence of the IB elevates student engagement and school culture throughout the school, even for students that do not participate in the curriculum. To explore this assertion, an analysis of the whole IB school, compared to demographically similar schools was conducted. For all three dimensions, IB schools had significantly higher rates of engagement. Effect sizes were small, with Cohen's *d* ranging from .20 for Emotional Engagement to .30 for Cognitive/Intellectual/Academic Engagement.



A school-level analysis showed that most, though not all, IB schools had higher averages than their comparison school(s). Effect sizes were particularly large for Cognitive/Intellectual/Academic Engagement.

Table 8. IB schools vs. similar schools

School	Cognitive/Intellectual/ Academic			Emotional			Social/Behavioral/ Participatory		
	School Mean	Comp. Mean	Effect Size	School Mean	Comp. Mean	Effect Size	School Mean	Comp. Mean	Effect Size
School A	37.32	33.27	0.45	24.32	23.86	0.07	7.76	6.56	0.41
School B	40.51	39.77	0.09	26.37	27.16	<i>0.15</i>	8.97	8.97	0
School C	37.59	36.13	0.18	25.15	24.38	0.14	8.46	7.87	0.23
School D	35.19	38.23	<i>0.37</i>	23.87	26.38	<i>0.43</i>	7.67	8.67	<i>0.38</i>
School E	42.44	37.32	0.71	27.44	25.34	0.39	8.96	9.01	<i>0.02</i>
School F	39.66	34.22	0.66	26.45	23.80	0.44	8.64	7.03	0.58
School G	38.47	36.96	0.18	25.99	24.49	0.24	9.09	8.15	0.35
School H	37.57	35.57	0.23	25.05	24.15	0.14	7.46	7.59	<i>0.04</i>

NOTE: *Italics* indicates effect size in favour of comparison group.

Conclusion

To date, this is the largest study of student engagement among IB students. Across each of the dimensions of student engagement, IB students rated their levels of engagement more highly than non-IB students. This held true for both the targeted sample of eight schools, as well as the national sample. In the targeted sample, small effect sizes were found for each of the dimensions in favor of the IB students, whereas in the national sample, a small effect size was found only for social engagement.

A school-by-school analysis showed that IB students tend to have higher levels of engagement than non-IB students within the same school. Analyses examining school-level effects of IB showed that IB schools tended to have higher rates of engagement than non-IB schools, although there were some effect sizes in favour of non-IB schools.

Future research efforts will aim to examine student engagement among IB students in the middle grades, using the recently developed Middle Grades Survey of Student Engagement. In addition, the IB will work with Indiana University to extend this research to schools outside of the United States.

This summary was developed by the IB Global Policy & Research Department. For more information on this, or other IB research, e-mail the IB Research Department at research@ibo.org.

To cite the full report, please use the following:

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