

Research summary

Exploring the benefits of the International Baccalaureate extended essay for university studies at the University of Virginia

Based on a research report prepared for the IB by:

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Project overview

This study seeks to understand how high school research activities may relate to successful research experiences and outcomes in college by exploring how the International Baccalaureate (IB) Diploma Programme's (DP) extended essay (EE) requirement relates to University of Virginia (UVA) undergraduates' academic performance, retention, willingness to engage in more research and future plans.

UVA, founded in 1819 by Thomas Jefferson, enrolls 21,106 students. The majority of undergraduates are female (55%), and the student body is racially diverse¹. Thirteen per cent of undergraduates are from countries outside the United States, with 130 countries represented. Ranked the second best public (25th overall) university in the US², UVA undergraduate admissions are highly competitive. Thirty-three per cent of applicants are admitted, with 94% of first-year students ranked in the top 10% of their high school class. The 6-year graduation rate is 94%. About one-third of students are awarded financial aid through the university's signature financial aid program.

The IB Diploma Programme is designed as an academically challenging and balanced programme of education with externally marked final examinations that prepares 11th and 12th grade students for success at university and life beyond. The programme is normally taught over two years and has gained recognition and respect from the world's leading universities. The aim of the IB is to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. Currently, the IB works with over 3,000 schools in more than 140 countries to offer IB programmes to about one million students. Besides the DP, the IB offers three other challenging and innovative programmes to students: the Primary Years Programme (PYP), the Middle Years Programme (MYP) and the IB Career-related Certificate (IBCC). The EE, required for all DP students, asks students to engage in independent, in-depth research on a topic relating to one of the six DP areas of study.

Project design

This mixed-methods case study examined the knowledge, skills, abilities and engagement attributable to the EE and focused on four research questions, addressed through:

- surveying students
- student records analysis
- individual interviews
- focus groups.

Mixed methods were deemed to be the most appropriate methodological approach, given that the research questions spanned both deductive and inductive issues. The research questions were as follows.

1. How well are the documented curricular aims of the EE achieved and sustained as students continue through university studies?
2. To what extent do students perceive the EE to be valuable to university preparation, and in what ways?

¹ Sixty per cent white/Caucasian, 12% Asian Pacific American, 7% African American, 5% Hispanic, 3% multi-racial or ethnic students and less than 1% Native American students. Six per cent of undergraduates declined to report their race or ethnicity.

² According to a *U.S. News & World Report* in 2012.

3. What, if any, correlations exist between EE grade and university success in terms of grade point average (GPA), continuation rates and post-university destinations?
4. What is the relationship between EE grade and the overall DP score?

One of the primary focuses of the study was to ascertain whether UVA undergraduates had participated in the individual steps of the research process necessary to conduct sound inquiry. The conceptual framework for the research process chosen was Stokking, van der Schaaf, Jaspers and Erken's (2004) 10-step process.

1. Identify and formulate a problem using subject-specific concepts
2. Formulate the research question(s), hypotheses and expectations (if any)
3. Make and monitor the research plan: research design and time schedule
4. Gather and select information/data
5. Assess the value and utility of the data
6. Analyze the data
7. Draw conclusions
8. Evaluate the research
9. Develop and substantiate a personal point of view
10. Report (describe) and present (communicate) the research

For the survey portion of the study, all former IB students enrolled as undergraduates at UVA ($n=1,045$) and a comparison sample of UVA students who participated in the Advanced Placement (AP) curriculum ($n=1,046$) were selected for participation. After removing duplicate and unusable data, the total number of survey respondents was 953. The survey instrument included questions on:

- background information
- high school research experience with the EE
- college research experiences
- writing, mentorship and resource usage in relation to research projects.

Background information collected included demographic information, socio-economic status, perceptions of prior academic preparation and educational, major, and career aspirations.

Summary of findings

The majority of the survey sample was female (66%) and diverse by racial/ethnic background³. While respondents were from a relatively more advantaged social capital background, they were more or less indicative of the type of students who attend UVA. The survey respondents also had strong prior levels of academic achievement (average SAT score was 2037 out of 2400, and average high school GPA was 4.22) and felt relatively academically prepared for college level

³ Fifty-nine per cent white/Caucasian, 17% Asian Pacific American, 4% Black/African American, 4% Hispanic/Latino, 3% multi-racial or ethnic, 6% resident alien and 7% unknown.

math, science, English, social science, and writing courses. Interestingly, the only subject area that does not mirror this pattern is perceived preparation for courses that require research (the greatest proportion of respondents only indicated “moderate preparation”). The most popular majors of the respondents included engineering, social sciences, business and undecided/undeclared, while popular career aspirations included medicine, business, undecided and engineering. Finally, the sample had very high degree aspirations: 41% and 37% aspired to at least a master’s or professional/doctoral degree, respectively.

Figure 1: Perceptions of high school academic preparation for college among the survey respondents

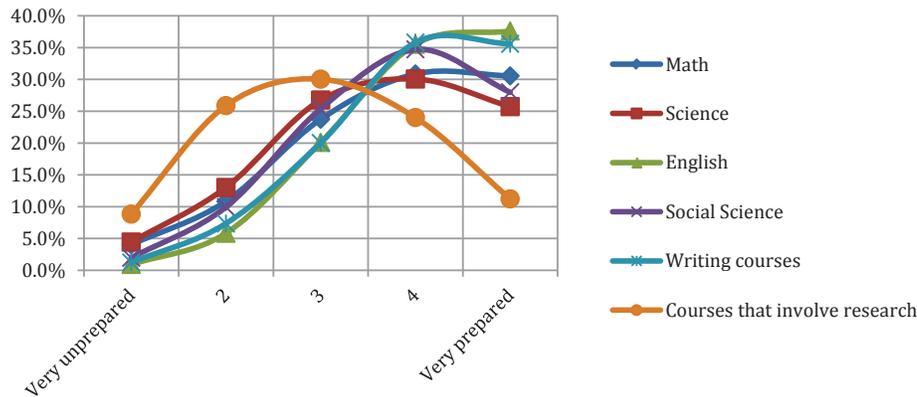
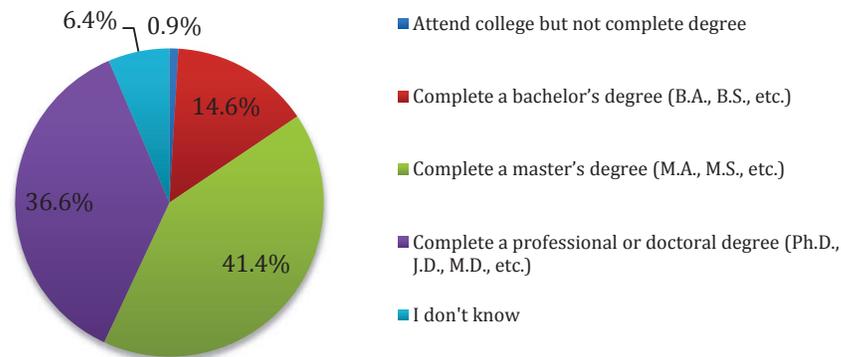


Figure 2: Educational aspirations of the survey respondents



Despite student reports of feeling somewhat less prepared for college courses that involve research than for other courses, results from the case study show that the extended essay is indeed having an effect on students’ research confidence and willingness to engage in future research. Former IB students at UVA were significantly more likely to indicate that they felt prepared for college-level coursework involving research than former AP students at UVA. Moreover, the IB alumni felt strongly that their EE experience prepared them to conduct the various facets of the research process, including:

- identifying the research problem
- creating the reference list

- drawing conclusions
- structuring a reasoned argument.

Seventy-three per cent of IB alumni in the study had executed a research project during their time at UVA, a significantly higher proportion than among AP alumni. Furthermore, IB alumni are overwhelmingly excited about their engagement with research: they are more proud of their research, more likely to intend to conduct more research in the future and more likely to find their research skills to be important to their future success than former AP students.

Figure 3: IB and AP alumni’s perceptions of excitement and engagement with conducting research

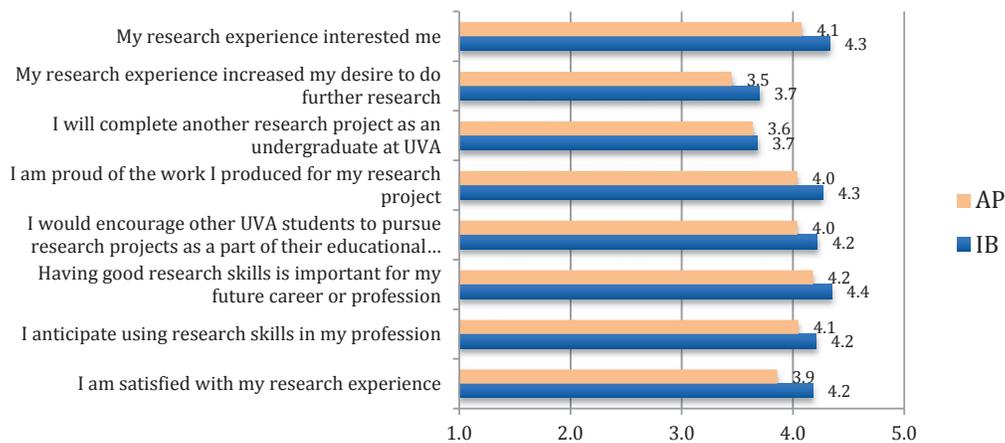
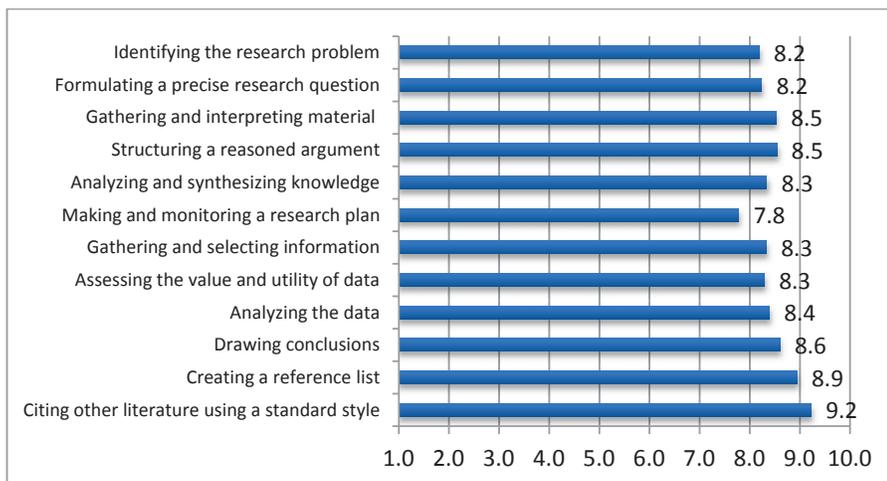


Figure 4: IB alumni’s perceptions that the extended essay experience prepared them for college-level work for a variety of facets of the research process



In the survey, respondents were asked to indicate whether they would be willing to participate in an interview or focus group. Two students participated in individual interviews and 19 took part in focus group interviews. The two individual interview students were specially selected because they

indicated that their EE was the research project of which they were the most proud. Participants were asked a series of questions developed to probe more in-depth into their EE and college research experiences. Of the 21 participants, 16 were female and 5 were male; 9 were seniors, 5 were juniors, 5 were sophomores and 2 were first-year students.

Interviewees had conducted a wide variety of research for different purposes, including:

- class assignments
- cumulative research projects
- as part of their job or internship
- on a professor's research project
- independently
- other activities.⁴

The general disciplinary areas in which the students conducted their research included: social sciences, science and engineering fields, and the humanities. The qualitative findings illuminated some specific skills that the former IB students identified were augmented by completing the EE project, including:

- the ability to gather and evaluate sources for their research
- growth in writing skills (eg constructing an argument) and confidence in using writing styles (eg MLA, Chicago) necessary for college-level work
- the capability of managing their time efficiently
- the reduction of anxiety around college writing assignments
- bolstered creativity and autonomy with pursuing a personally-chosen research topic.

Finally, performance on the EE does appear to bear a relationship with both overall DP scores and college-level performance. This case study found a moderate correlation ($r=.44$) between EE and DP scores among the IB alumni at UVA. In addition, findings showed a statistically significant relationship between extended essay score and first-semester and final-semester college GPAs. Moreover, this relationship remained significant even after controlling for gender, race/ethnicity, income level, high school GPA and SAT score. However, no relationships between extended essay scores and college retention or career or educational aspirations were identified.

Conclusion

While there were some limitations to this study, results of this investigation suggest several implications for practice and assessment, including a need to better understand why some students feel more prepared than others to conduct research in college. In addition, study findings suggest that it might be beneficial for the IB to provide their participating schools with additional resources and guidance regarding specific components of the research process and support the transfer of research skills from high school to the college setting. Finally, the findings indicate a need for additional research on the advantages and disadvantages of student participation in professors' ongoing research projects.

⁴ Please note that individual students had conducted multiple types of research projects.

References

Stokking, K, Van der Schaaf, M, Jaspers, J and Erkens, G. 2004. "Teachers' assessment of students' research skills". *British Educational Research Journal*. Vol 30, number 1. Pp 93–116.

This summary was developed by the IB Research Department. A copy of the full report, prepared by the Center for Advanced Study of Teaching and Learning in Higher Education is available at <http://www.ibo.org/research>. For more information on this study or other IB research, please email research@ibo.org.

To cite the full report, please use the following:

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