



Key findings from research on the Diploma Programme (DP) core

The International Baccalaureate (IB) Global Research department collaborates with universities and independent research institutions worldwide to produce rigorous studies examining the impact and outcomes of the IB’s four programmes. This resource provides a brief overview of key findings from recent research on the DP core, which includes theory of knowledge (TOK), the extended essay and creativity, activity, service (CAS).

Theory of knowledge (TOK)

In theory of knowledge, students reflect on the nature of knowledge and on how we know what we claim to know.

- A study in **Australia** explored IB alumni and current DP students’ ratings of their **critical-thinking abilities**. Quantitative results indicated gains in the use of critical-thinking skills between the two successive years of the DP. Additionally, second-year DP students reported a significantly greater likelihood of using a range of critical-thinking skills (Cole, Gannon, Ullman and Rooney 2014).

Perceived TOK outcome	Mean score (SD)	Comparison of means (Year 11–12)
Critical-thinking skills	Year 11: 4.23 (1.25)	$t = 3.79$ $p < .001$
	Year 12: 4.50 (1.27)	

Note: $n = 1,242$

Table 1: Mean differences in students’ perceived outcomes of TOK study, by year cohort.

- Examining the longer-term impacts of the DP on students, a **global study** reported the perspectives of a diverse group of alumni from 20–63 years of age. DP alumni reported that in the years following completion of the DP, they were able to more fully appreciate the benefits of participating in **theory of knowledge**, as one former student explained: “*You know, I benefited more from [TOK] after I did it than when I was doing it ... and I probably now get more out of thinking about the things that were presented at that time than I did when I was a student there*” (Wright 2015).
- TOK teachers from across the **world** offered their perceptions of the **impact and implementation of TOK** in IB World Schools. The teachers believed that the main benefits of TOK for students are the ability to critically evaluate information and to recognize and reflect on personal assumptions. The teachers also strongly agreed that teaching TOK has provided valuable professional

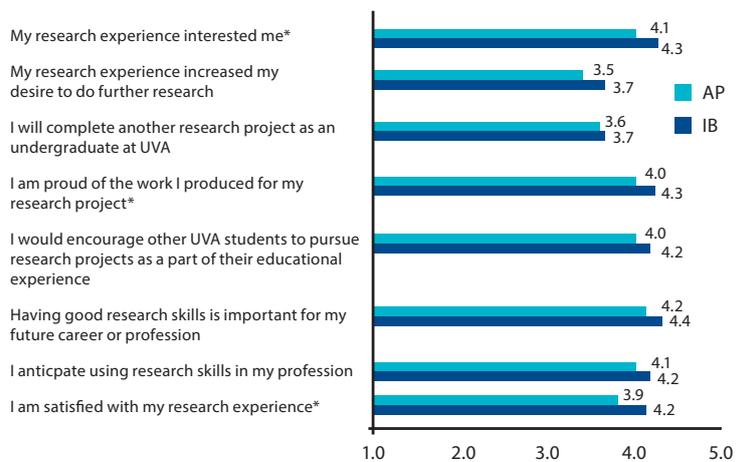
development for them, as it has enhanced their own critical thinking as well as understanding of content and connections across disciplines (Bergeron and Rogers 2016).

Extended essay

The extended essay is an independent, self-directed piece of research, culminating in a 4,000-word essay.

A series of studies explored student experiences with the extended essay in the United States, the United Kingdom and Canada.

- A study at the University of Virginia (UVA) in the **United States** explored how the experience of completing the **extended essay** prepares students for university-level research and academic success. In comparison to Advanced Placement (AP) students, former DP students were more likely to report that they: felt prepared for university coursework involving research; had executed a research project at UVA; were proud of their research; intended to conduct future research; and found their research skills to be important to future success. Several of these differences were statistically significant (Inkelas, Swan, Pretlow and Jones 2012).



Note: * indicates statistical significance, $p < .05$ (Bonferroni adjustment was used to adjust for potential Type 1 errors).

Figure 1: IB and AP alumni’s perceptions of engagement with research.

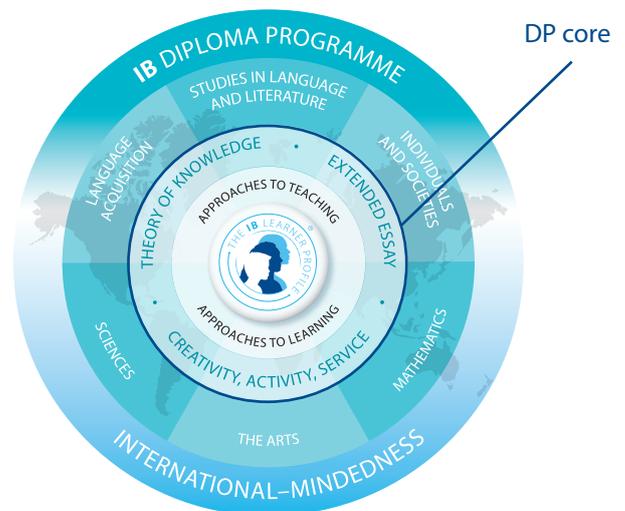
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- Another study investigated the **high school research experience** of former DP students at two universities in the **United Kingdom**. DP graduates reported that they enjoyed and valued their extended essay experience and believed it helped them to develop their critical- and independent-thinking skills (Wray 2013).
- The final study in this series explored the impact of the **extended essay** on student success at a university in **Canada**. DP graduates indicated higher ratings than their non-IB peers on self-regulated inquiry learning and were also less likely to view learning primarily as memorization. Former DP students perceived a number of benefits of the extended essay, including developing enhanced organization, reading, writing and analytic skills (Aulls and Lemay 2013; Aulls and Peláez 2013).
- A study in **Argentina, Canada and the United States** explored the **implementation and impacts of CAS**. Both students and coordinators reported a range of impacts of student participation in CAS, including helping students to: develop an ethic of service; become more caring, open-minded and reflective; and develop more self-confidence and maturity (Billig 2013).
- Investigating the **“academic civic-mindedness”** of DP students in the **United States**, student and teacher interviews indicated that the frequent use of discussions, debates, presentations, writing assignments and teamwork in DP classes helps students to develop the skills that are necessary for civic engagement. Furthermore, in comparison with a nationally representative sample of 12th grade students, DP students scored higher on 9 out of 10 items that tested their knowledge of US government structure, functioning and history (Saavedra 2014).

Creativity, activity, service (CAS)

In creativity, activity, service (CAS), students complete a project related to these three strands.

- A Jeff Thompson Award winner conducted a study on the use of **reflection within CAS** in six IB World Schools in **Turkey**. The findings suggested that all of the schools were encouraging reflection before, during and after CAS activities, as outlined in the *Creativity, activity, service guide*, and that schools were “moderately successful” in providing feedback on student reflections. The author, however, also recommended that schools require fewer but more authentic reflections, use varied forms of reflection and allow flexibility in the timing of reflections (Perry 2015).



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