

# 4,000 Words

DESIGN THINKING THE IB ExE

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4,000 Words: Design Thinking the IB ExE  
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## KEYWORDS

Extended Essay, Design Thinking,  
Human, Storytelling, Word Limit,  
Research.

# *Preface*

I wrote my IB Diploma Extended Essay in 1981. It was on the formation of sodium alum crystals. I was fascinated with crystal shapes. That was a while ago, but I think the expository purpose of the essay is still the same. This project exposes one's scholarly mindset as well as intellectual promise, & potentially launches an interest in formal research. 4,000 words is around 16 pages double-spaced on US Letter paper. Make it readable. Make it interesting. Make it yours.

This e-book is getting written to connect design thinking & design-build concepts from my Stanford youth creativity program with the IB Extended Essay. It is based on my research experiences starting with the Extended Essay & through my time at UC Davis & Stanford University in research & teaching. I would like to think that my research skills grew & improved over this time span, but I feel that the human element of design thinking makes the purpose & passion more meaningful.



conditions will be identical.

Why then does the scholar of  
phenomena that occurred under condi  
Perhaps there is a distinct boredom  
Each scientific experiment may be s  
knowledge. Once the knowledge passe  
be used in many ways. The scientifi  
ere words in a book can become me  
phenomenon by himself.

Does every mind, especiall  
Firstly, "pragmatism" should be de  
intellectual problems, and a theor

*From my ToK essay.*

I've really enjoyed writing this e-book. It draws from my personal experience as an IB student decades ago. And it has let me connect what I have learned over time, especially the design thinking ideas that excite me in the present. This has given me some sense of meaning & fulfillment. Yet, I am reminded even today that "there is a first time for everything" which re-ignites my passion for discovery. The IB Extended Essay will be your first & only time you need to write one. Make it a good time.

*Read Me*

## *Read Me*

This e-book highlights opportunities for IB students to infuse their Extended Essays with research-level scholarly form & function. The Extended Essay fundamentals are ascribed by the IBO, & should be discussed with the teacher-supervisor. The chapters herein present extensible talking points that usually go un-spoken unless an emerging researcher has a highly committed mentor. Get ready to be mentored.

*Design  
Thinking:  
What & Why*

Design Thinking in the YCISL program at Stanford University involves storytelling of a journey with interesting characters, actions & connections. To weave a story, we encourage using fast thinking, asking questions, divergent-convergent thinking, filling & crossing gaps, & positivity as exploratory practices. With this approach, we aim to enhance the extended essay with emotional intelligence which communicates a human-centered essence & thoughtful sense of purpose.

*A Waypoint  
En Route to  
College*

The IB website says that “the extended essay provides practical preparation for undergraduate research.” It is a waypoint positioned between an IB class paper & a college-level term paper between which the level of academic critical thinking & scholarly writing rises to the latter. Through the extended essay, the IB student designs & pilots a study to become introduced to the research process as well as research domains, & learns research-quality communication skills.



# *Ideation & Brainstorming*

Design thinking an Extended Essay project starts with ideation & brainstorming. Ideation involves having ideas & selecting one or more to contemplate further processing. The action that amasses ideas is brainstorming where we must be creatively agile, achieve imaginative flow, resist self-editing, & avoid self-doubt. Practice brainstorming exercises such as “30 Circles” to elevate ideation productivity & brainstorming performance.

*Reading is the  
only way*

Another IB premise is that the Extended Essay perhaps connects with one of a student's DP courses. Think of this as a starting point (like the "You are here" symbol on a map), & stepping into (or going on a journey through) the research literature is a required part of the effort. For the IB student, the purpose of such reading is to discover relevant knowledge & references, as well as to become fluent in research terminology & language. This feeds scholarship.

# *Bibliography & References*

The bibliography reflects much of the emotional intelligence & design thinking in the project. It connects your work to that of other people & associates your research with other contributions to the knowledge field. Ensure that your bibliography is professionally presented & contains authoritative sources. Use the references to support your project & justify your idea. Even a quick glance is telling of the project effort & quality.

# Research Plan & Blueprint

The Extended Essay is a sizeable deliverable & deserves a research plan. This outline manages the time & effort, plus maintains a focus. We can use the YCISL simple innovation process of ideation->prototyping->building->testing->rollout to plan the project with direction & growth. Start by crafting a working title with keywords for scope. Then compose statements about the problem, position, & vision. Add sketches, flowcharts, & project task management charts. Let it serve as a blueprint.



# *Rationale & Justification*

A rationale statement in your Extended Essay introduction section reasons why the work is important & significant, even perhaps urgent. This statement includes the research question plus connections to your references. Design Thinking is particularly useful here as a way to describe persuasively how the research impacts people in the context of problem, solution, & opportunity. Justify the idea & the deep dive into the topic.

# Rapid Prototyping & Iteration

Time, resources & energy are limited for this project. The Extended Essay assignment spans about 8 months. There is time to prototype & iterate - & you should. But do these things early & quickly. Find the bugs, the issues, & the deal-breakers before investing substantial energy & resources. Work through your material using a “must-have” & “nice-to-have” system to manage content. Apply different styles to see which communicates your thoughts more clearly, effectively & convincingly.

*Better  
Questions,  
Better  
Answers*

We hardly get enough practice at asking questions. But research requires asking questions. Good questions & timely questions, really. And many questions. Questions that are both accurate & precise to the scope of the research topic. Questions that start a line of enquiry. And questions of every type. Not just who, what & why, but also when, where & how? Research discoveries are rooted in questioning minds, & the better the questions, the clearer the answers will be.

Scholarly  
Critical  
Thinking

There is a particular quality to the research question-asking skill, & that is to be critical in a scholarly manner. Research knowledge is often debated, & sometimes incorrect.

Discern between opinions, facts & true facts - & base the expression of your own thoughts with full awareness of these differences. This is a leadership skill. A leadership with clear position as well as clear stance. This is how you develop an argument for your research project.



Storytelling,  
EQ &  
Mindfulness

The Extended Essay is your opportunity to tell a story about your research experience & discoveries. Using a storytelling framework that has characters, places, instances, actions, & interactions, demonstrate a connected & dynamic system of emotional intelligence that pulls your reader into the story through mindful imagination & description. This requires storyboarding as well as iterative drafting of the story.

# Writing with Empathy

Develop an idea of who you are writing the Extended Essay for. Despite not knowing your IB reader personally, you can form a composite character profile through design thinking empathy. This will help shape the story as well as select phrases, terminology & jargon. Use encouraging language with a reassuring air that invites the reader to follow attentively & appreciate. Describe a perspective to be shared & build a relationship. Try being the teacher for a day (or more) to discover opportunities for empathy.

# Details, Readiness & Rollout

Create a pre-flight checklist for critical aspects of the final Extended Essay before submission.

Here are 9 suggested details to work on in the readiness phase (the period between when you stop making major changes, & when you actually freeze the essay & rollout for final submission).

# **#1**

## *Word Count.*

Word Count is a function found in most word processors. Use it to make sure that you are meeting the 4,000 word limit. If you have too many words, ask yourself whether you have been wordy or added un-necessary sections. If you have too few words, check for “thinner” parts which could use more detail. Also, make sure the word count for individual sections of your essay are balanced.

## #2

### *Spelling & Grammar Checker.*

Apply a spelling & grammar checker to your work. And make sure you are using a consistent voice & tense. Be vigilant in the changes suggested or made by the checker so that the intended meaning stays true, & the word choice does not become boringly repetitive. As the owner of your Extended Essay, take responsibility for removal of distracting blemishes such as mis-spellings, typos & sentence structure issues.



### **#3**

#### *Word choice.*

Choose words that concisely support the story, & convey the information at the appropriate technical level. Lean towards positive rather than negative words. Clear out ambiguity & vagueness with sensibly precise subject, object & action words. But most of all, be comfortable with the words & phrases you use to establish an authentic connection with the reader.

## **#4**

### *Plagiarism.*

Know it. Don't do it. Plagiarism is the unethical duplication of prior work, & opposes the human-aware element of design thinking. Sometimes, it is unintentional because computer copy-&-paste is so easy, & a writer carelessly forgets to cite a source or use quotation marks. Know that the IB reader can easily identify plagiarism & check for it.

## **#5**

### *Format.*

Format consistency may be taken for granted if there are no issues, but inconsistency will stand out & provoke a negative impression. Paragraph indents & spacing, pagination orphans, page numbers, headers & footnotes, etc. all need to be consistent. And if you want your Extended Essay to look like it is publication-quality, look up the author guide for your favorite research journal. They do exist.

## **#6**

### *Keyword list.*

Create a keyword list. An Extended Essay of 4,000 words should have 3 to 10 keywords. Most, if not all, of the keywords should appear in the project title as well as in a abstract.

Keywords should be woven through the essay. A web search engine should find your project in the hit results with these keywords. These keywords help the reader remember the focal point of your work during & after the reading.

## **#7**

### *Proof-read.*

Allot time for proof-reading. And do it conscientiously so that it is not rushed. If your advisor is agreeable, let others read your essay, or parts of it - as an additional check. Track the feedback then decide if they are must-haves or really nice-to-haves. See if your reader can give you a one sentence summary of the work that matches your thoughts. Good to know whether you left the right impression.

## **#8**

### *Project Title.*

Make sure your project title does two things. The first is to set positive expectations & curious interest. The second is to align these expectations with the work presented in the essay. Avoid ambiguity, generality & similarity. Learn what makes for a good title by looking through research journals. Particularly look for accuracy, precision & concision in the titles that pull you in closer.

## #9

*First impression. OOBEx. The first 30 seconds.*

Remember that your Extended Essay will probably be preceded by another essay that had to be read & evaluated. How does your work help the reader focus attention on your work? The essay pieces that the reader sees in the first 30 seconds may influence the rest of the time on your essay so check your essay's first impression & "out-of-box-experience" (OOBE).

*Going the  
Extra  
Distance*



An **abstract** is required, but it does not count towards the 4,000 limit. It does have a 300 word limit. First, focus on the IB assessment criteria for the abstract content. Make sure you have included the research question, the project scope, & the featured takeaways. Nothing less. Nothing more. However, since this may be your first time writing an abstract, there is learning involved for style. Read abstracts in research journals while paying attention to flow, concision & language.

Make sure your keywords appear in the abstract as well as in your project title & main body. Alignment is critical. Chances are you read abstracts in your research literature review. The abstract along with the project title usually combine to draw readers to want to learn more about the research. Do you recall this feeling? Understand this feeling & use it to your advantage as the author of your Extended Essay.

**Acknowledgements** are allowed & do not count in the 4,000 word limit. This optional part is included in this e-book because it is human-centered & connects with our design thinking theme, particularly storytelling, EQ & mindfulness. It also enables gratitude & positivity mindsets as soft tonal elements. In research publications, acknowledgements recognize funding sources & professional assistance. Acknowledgements in books often thank people for their contributions & support.

If you follow the Rapid Prototyping & Iteration advice, you will have various versions of particular sections, or versions of complete drafts. **Document Version & Change Control** could help. On the front page, note version numbers with current dates & save separate copies of the drafts. Also track significant content changes in a Change History table. By archiving various versions of prototypes & iterations, retracing or revisiting prior efforts could save you valuable time & energy.

*Just  
one more  
thing*

Including mention of this website in  
case you are curious about the scope  
of undergraduate research at  
Stanford University...

**“Undergraduate Research  
and Independent Projects”**

*Stanford VPUE*

[undergradresearch.stanford.edu](http://undergradresearch.stanford.edu)

*If you  
reached this  
point...*

Start by imagining. Imagine how your project title could be more concise. Imagine what empathy level the IB reader is going to feel. Design Thinking stretches the imagination & grants attention to details. Apply design thinking to your Extended Essay with the intent to grow your skills in scholarly enquiry, investigation & communication towards the college level. With design thinking, this project can be a transformative & meaningful life experience. Design it. Think it. Build it.



## 4,000 Words

*Are you feeling uncertain about your IB Extended Essay? Look inside for insights into how design thinking can help enhance the storytelling aspect of the project & essay. Learn how to design think & design-build the project idea as well as conduct the pre-flight check before submitting your work for assessment. From first impression to last impression, design thinking features a human-centered parlance that connects ideas, actions & people.*