

Topic: Start of a Research Process

Goal: Get the experience of the research area identification and the essay writing.

Length: 2 hours.

Before class:

- choose a scientific adviser and to determine where your research interests match;
- read a paper [1: chapter 1.2].

Information

1. How to start a research process

The research process is the step-by-step procedure of developing one's research. It begins with a problem. Identifying this problem can actually be the hardest part of research.

At the start, you have to find a question for which you have no answer. This doesn't mean that someone else doesn't already have an answer. After this question needs to be converted to an appropriate problem statement.

NOTICE: This problem need not be Earth-shaking.

Many of you have professional experience which can lead to possible research. Always be careful to differentiate between research and self-enlightenment. In general, you can search the Research Problems in these sources:

- Observation.
- Literature reviews.
- Professional conferences.
- Experts.

When examining a potential research topic, for instance when reviewing the different phenomena introduced in “action research” narratives and searching for an explanatory perspective, the following types of questions may be useful. They may help identify a “problem” to be researched, or a hypothesis to be applied to a problem:

- What is actually happening in this situation
- Would it still happen this way if ...
- In this context, if X does this, would Y then ...
- What causes X to react to Y in this way

More concretely, when reviewing possible research “problems”, your questions could include the following (points 1-3 would be preliminary to posing a theoretical approach, with points 6-8 required to ‘test’ the theory. Points 4-5 develop the working theory or hypothesis itself):

1. What bothers you about a particular “problem”? What information seems to be unclear, or incomplete, or missing, or improbable as stated?
2. What are the essential concepts and issues relevant to the problem?
3. Does the description or implementation of the problem vary? If so, how and why?
4. Can you state a relationship between the variables of your problem?
5. Can you hypothesize an answer?
6. Can you collect primary and secondary data to test the hypothesis?
7. Can you collect original data to further test the hypothesis?
8. Is the problem you identify part of a larger problem?

Once you’ve identified a research problem, state it clearly and completely and determine the feasibility of the research.

2. How to write essay

There are many ways to write an essay. However, most essays take a repetitive form sometimes known as the "hamburger essay". What this means is that the introductory and concluding paragraphs are very similar, whereas the most important information is found in the body of the essay.

Let me to introduce main steps that help you to create an essay for 30-40 minutes:

1. Select the topic of your essay.
2. Choose the central idea, or thesis, of your essay.

For example: Information technology has revolutionized the way we work.

3. Outline your essay into introductory, body and summary paragraphs.
4. The introductory paragraph begins with an interesting sentence.

For example: Home workers have grown from 150,000 to over 12 million in the past 5 years thanks to the wonders of the computer. There are a number of types of introductions: Interesting statistics, a quote from a famous person, or a rhetorical question such as "Did you know that...".

5. After this first sentence, add your thesis statement from above. The thesis clearly outlines what you hope to express in the essay.
6. Use one sentence to introduce every body paragraph to follow. This linking to ideas you will develop further in your body paragraphs provides structure to your essay.
7. Finish the introductory paragraph with a short summary or goal statement.

For example: Technological innovation has thus made the traditional workplace obsolete.

8. In each of the body paragraphs (usually two or three) the ideas first presented in the introductory paragraph are developed. Remember that referring to ideas first introduced in the initial paragraph provides structure to your essay.
9. Develop your body paragraphs by giving detailed information and examples.

For example: When the Internet was first introduced it was used primarily by scientists, now it is common in every classroom.

10. Body paragraphs should develop the central idea and finish with a summary of that idea. There should be at least two examples or facts in each body paragraph to support the central idea.
11. The summary paragraph summarizes your essay and is often a reverse of the introductory paragraph.
12. Begin the summary paragraph by quickly restating the principal ideas of your body paragraphs.

For example: The Internet in the home, benefits and ease of use of modern computer systems...

13. The penultimate sentence should restate your basic thesis of the essay.

For example: We have now passed from the industrial revolution to the information revolution.

14. Your final statement can be a future prediction based on what you have shown in the essay.

For example: The next step: The complete disappearance of the workplace.

Tips:

1. Use strong verbs and avoid modals to state your opinion. It is better to write:
The workplace has evolved than The workplace seems to have evolved
2. Do not apologize for what you are saying. An essay is about your opinion.
3. Do not translate from your mother tongue. It will quickly get you into trouble! It will be better to use target language from the start.

Roadmap

❖ Lesson

1. In accordance with the described in [1] classification, determine the type of your undergraduate research. Will it be different from your research in the master? Justify your answer and complete it in the form of an essay in Russian (time limit: 40 minutes).
2. Get approval of the teacher.

❖ Homework

1. Read the self-study materials.
2. Together with the adviser (if you have) find the problem for your future research.
3. Make a report

About the final report

The workshop report mandatory contains:

- the title page;
- the table of contents;
- the introduction;
- the practical sections;
- the conclusion;
- the appendix (*if necessary*).

The size of the report may vary. At the same it should not contain the full text verbatim retelling of the well-known theoretical positions, standards, etc.

Paper and electronic copy of the report is given to the teacher within a one week after end of this workshop.

Self-study materials

- 1) Коротков Э.М. Исследование систем управления. – М.: ДеКА, 2000.
URL: <http://www.bibliotekar.ru/sistema-upravleniya/4.htm>.
- 2) Module Handbook: Description of compulsory modules of master course
“Research in Computer and Systems Engineering”. 2016. URL:
<https://griat.kai.ru/research-in-computer-and-systems-engineering1>.
- 3) Essay Writing: The Basics. URL: <https://student.unsw.edu.au/essay-writing-basics>.
- 4) Essay writing: an overview (video). URL:
<http://www.screencast.com/t/2hybfnrDjL>.
- 5) Structuring your essay: video tutorial. 2016. URL:
<http://www.screencast.com/t/o9SsJ5eyv>.
- 6) Jason Eisner. How to Find Research Problems. 2013. URL:
<http://www.cs.jhu.edu/~jason/advice/how-to-find-research-problems.html>.