



Funded by
the European Union

Promoting ACTIVE and Responsible Citizenship in Schools



Toolkit

II. Activity book for teachers

Activity 3 & 4

Designing own research

Design the research suited for your purposes

&

Make sense of information and formulate conclusions



Sukromna základna
škola
Felix



WSB University



Funded by
the European Union



The European Commission 's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Attributed to:

Developed under the project ACTIVE financed by Erasmus+ program

Organization responsible for development of the material: Odpovědná společnost, z. s.

In collaboration with project partners

Authors: Mareš, Matěj & col.

Version 1.0

November 2022

Content

Content.....	2
Toolkit and activities for teachers.....	3
ACTIVITY 3: Designing own research - design the research suited for your purposes.....	4
The Activity consists of the following steps:	4
Expected outputs and outcomes of the activity	4
Main principles from Methodology to be considered:	5
Time needed for the activity:	5
Before you start.....	6
Materials needed for the activity	6
ACTIVITY PLAN	7



Toolkit and activities for teachers

The Activity is part of the Toolkit which is composed of following three main parts:

- I. Methodology for teachers
- II. Activity book for teachers
- III. Working materials for activities&students

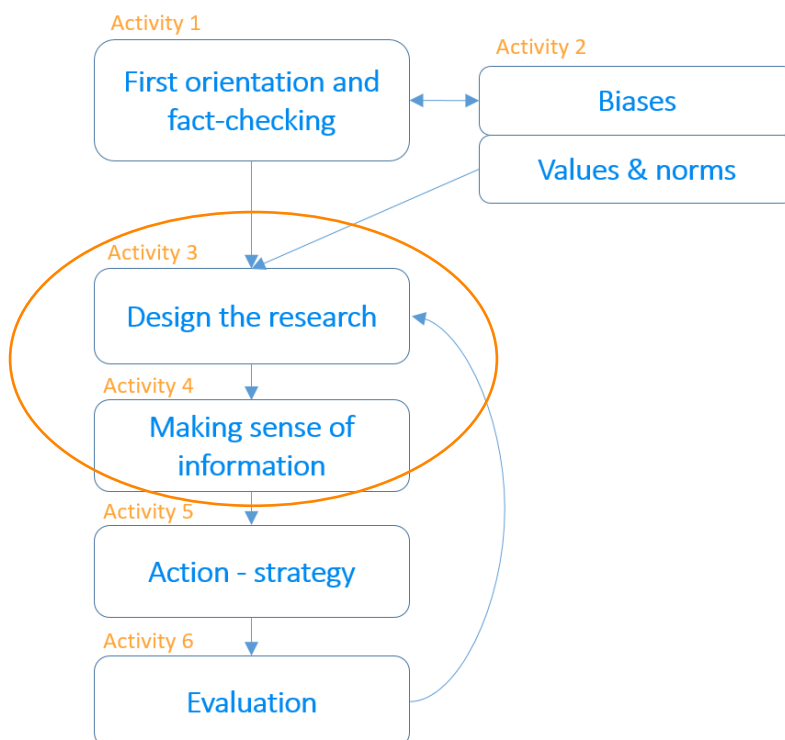
I. Methodology for teachers (*this document*) consists of explanation the principles and terms and concepts to be used when implementing the Toolkit. The goal of the methodology is to provide background and set the common ground and understanding for teachers so they are ready to take the Toolkit in to the classroom.

II. Activity book for teachers is a set of working activities (step by step scenarios) that the teachers can take in to the classroom. The activities correspond with the topics of the Methodology so teachers can easily find appropriate activity for the topic covered in the methodology. There at least one activity for a topic covered in the Methodology.

III. Working materials for activities&students provide materials to be used with students during the activities. Materials consists mainly of templates that teacher can hand over to students to better structure the activity.

Before you start with the Activity **get familiar with the relevant parts of the Methodology** for teachers and the overall composition and logic of the activities presented in the Activity book for teachers to have the overall idea what topics are covered in the activities.

Logic of the activities





ACTIVITY 3: Designing own research - design the research suited for your purposes

Activity has direct connection to the topics covered in the MODULE 3 & 4 of the Methodology
But the activity also directly utilizes the knowledge from the MODULE 0, 1 & 2 of the Methodology

Students will learn how to prepare and conduct own research to gain knowledge about selected issue.

Students will learn to formulate research questions, research hypothesis and criteria to judge them.

Students will learn to use research methods of desk research (mainly how to approach information from the internet – utilizing the knowledge from the Activity 1)) and how to do their own field research (surveys and interviews).

After they collect the data and information the students will learn how to analyze the data and make sense of the information. They will test the strength of the evidence available before making conclusions.

By this experience students will understand that they should first take the argument or opinion as an hypothesis to be tested before coming to haste (and not supported) conclusions. In other words the students will learn to base their decisions on evidence.

The Activity consists of the following steps:

Step 1: The topic – issue concerned (topic selection)

Step 2: Preresearch phase - orientation in the issue and problem definition (divergent phase)

Step 3: Formulating the research questions, hypothesis and criteria to judge them (convergent phase)

Step 4: Choosing the methods to be used

Step 5: Prepare for the research realization

Step 6: Research realization

Step 7: Analyze the data and assess the evidence

Step 8: Formulate conclusions based on findings from research and the evidence

Expected outputs and outcomes of the activity

NOTE:

- This activity can be used and done with students to explore and deepen understanding of any topic.
 - This can be any societal issue (cutting trees in Amazonia, war in Ukraine etc.) or topic connected to the theme that is part of regular class (geography, history, biology etc.)
 - Or the Activity can be applied for a topic concerning the school, town or class (e.g. to find solutions for topics concerning opposing positions)

Overall goal of the activity: Design and conduct the research to collect relevant data and information to explore the issue and find answers to the questions we are looking for. The underlining goal is to learn how to make responsible decisions supported by evidence.



The Problem: People (students) are not familiar with principles and methods how to grasp a topic to get coherent understanding for responsible decision making.

Assignment overview:

- Students will formulate research questions, research hypothesis
- Students will formulate relevant criteria to judge the hypothesis (arguments, opinions)
- Students will design their own research to find answers to the research questions
- Students will conduct the research in the designed scope (e.g. desk research, interviews, surveys)
- Students will analyze the findings and formulate conclusions about the concerned issue (using simple statistical methods and tests for evidence)
- Students will examine what knowledge the research provided to them

Expected outputs of the activity:

- ❖ Topic of the research defined by research questions
- ❖ Setting hypotheses to be tested
- ❖ Research design (with appropriate criteria, methods, sources and target groups)
- ❖ Relevant data and information providing evidence
- ❖ Conducting field research
- ❖ Analyzing and interpreting data (both secondary and primary)
- ❖ Formulation of conclusions

Expected outcomes:

- ✚ Students can design research relevant for the topic (questions asked)
- ✚ Students can use specific method(s) to obtain relevant and reliable data
- ✚ Students have experience with field research (if conducted)
- ✚ Student can formulate relevant conclusions supported by evidence

Main principles from Methodology to be considered:

This activity is utilizing and combining the knowledge from all modules from Module 0 to Module 4.

- ✚ Research design (Module 3)
- ✚ Use of field research methods (Module 3)
- ✚ Disinformation, misinformation and fake-news (Module 0)
- ✚ Understand criteria for quality of data and information (Module 1, chapter 1.1)
- ✚ Finding data and information on the internet (Module 1)
- ✚ Understand the role of actors and their perspectives in the issue concerned (Module 2)
- ✚ Asses the strength of evidence (Module 4)
- ✚ Formulate conclusions supported by evidence (Module 4)
- ✚ Understand principles of making sense of information (Module 4)
- ✚ Understand conspiracy theories (Module 4)

Time needed for the activity:




Depends on the topic and the number of students in the class and weather students will look up the information during the class or before as home assignment. Dependent also on the presence and scope of own research.



Before you start

Before you start you need to pick a relevant theme/topic/issue to be explored. Try to narrow broader topic (e.g. climate change) to some specific issue (e.g. the argument of climate change sceptics, the climate change impacts, the solutions to climate change, attitude toward climate change in your school, the role of politicians/media in forming the attitudes to climate change, etc.).

How to choose the topic (problem definition) and the biases:

-  Beware of the problem definition not to limit the further research (exploration) by the students (see Module 0, chapter 1.3).
-  Be self-critical not to define the topic/problem influenced by your own biases.
-  Be self-critical and open to different views (do not mistake them for fake-news).

Materials needed for the activity

You can approach the task in two ways (or combine these):

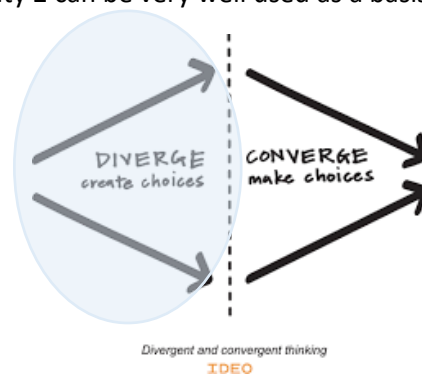
- a) You let students to explore and find the sources of information by their own.
- b) You will point out selected sources of information about the topic to the students. So the students will start with these selected sources.



ACTIVITY PLAN

Motivate students:

- That if they want to understand about something or want to persuade (argue) someone about something they should have arguments based on relevant and reliable information
 - That they will be looking for information about the topic instead you giving them the information first hand
 - By picking up some actually relevant topic or by letting them to pick an issue they want to work on.
- I. **The topic – issue concerned (topic selection).** It is expected that you are continuing with the issue from the Activity 1 and/or 2 – then follow to explore the topic selected in Activity 1 or 2. Using **Activity 3 as separate single activity** is also possible. In this case you need to select an issue that will be the topic of the research. There are two possibilities:
- a. **(discussion)** Let students decide about specific topic(s) they will be working on. The theme of the **topic should be focused**, we recommend to choose some actual urgent societal issue like deforestation of Amazonian forest, war in Ukraine, climate change or some topic in the range of the class like historical event from some specific period etc.
 - Let the students explain why they choose this topic (personal interest, actuality etc. Do not go to details, see step II).
 - b. **(assignment)** OR You choose the topic according the subject of class or some specific issue you would like students to work on. (see above Before you start)
 - Briefly explain the topic (do not go to details about possible controversies and different points of views) and go to the next step.
- II. **Preresearch phase - orientation in the issue and problem definition (divergent phase)**
(discussion) The aim of this phase is to **identify important aspects** of the issue. The outcomes from the Activity 2 can be very well used as a basis for orientation in the issue.



Source: from <https://designthinking.ideo.com/>

- a. **(discussion)** Discuss in class with students:
 - Q: *What is important in the concerned issue?*
 - i. *Setting aside relevant information from irrelevant based on the purpose and goals of research.*
 - Q: *What are the relevant actors?*
 - ii. *You can start brainstorming all the actors and then exclude the irrelevant ones from your choice.*



Q: What are the opposing narratives, perspectives and opinions?

iii. This is an important phase, be meticulous and open minded towards opinions you yourselves do not agree. Making them an input to research, understanding them, that does not mean that you agree with them.

Q: What topics should be covered (explained) to get relevant picture about the issue?

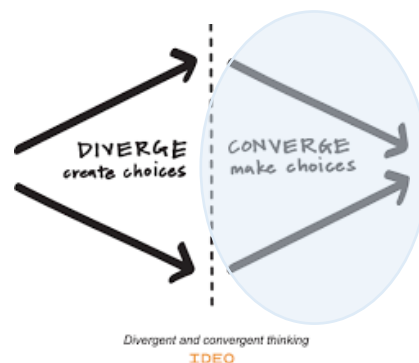
iv. Limit to narrow topics and try to go in depth, being too general in too many topics is of no use for the research purposes.

Q: What problems to solve? How are these problems perceived by different actors?

Q: Solutions for what we want/need to find?

- Use template **3-I Summary of important aspects**
- If needed (e.g. to save time or the topic is broad) it could be better to give students *assignment* to prepare before the class as a home *exercise/assignment*

- II. **Formulating the research questions, hypothesis and criteria to judge them (convergent phase) (assignment and/or discussion)** The aim of this phase is to formulate the “Problem” or “Solution” you want to solve by the research. We can call these as defining the **main goal of the research, defining the research questions, formulating hypothesis and criteria to judge them:**



Source: from <https://designthinking.ideo.com/>

Q: What is the exact issue for investigation?

Q: How can it be translated into specific set of questions?

Q: (for inductive research questions) For **exploratory research** ask what do you want/need to find out?

Q: (for deductive research questions) If the students can already formulate assumptions / opinions / explanations / arguments about the issue (from preresearch phase) than we can actually ask question as: Is this really true (did that happened, did that caused that, do they think or did that)?

For such questions make students formulate **hypothesis** to be tested and the criteria that will used to test the hypothesis:

Q: How can the research question be translated into hypothesis? (basically assumption/arguments to be further tested)

Q: Criteria formulation: Based on what evidence we will decide whether the hypothesis is correct?



Example hypothesis: Assumption or claim (mine or someone's else's) that family background is connected to views on climate change.

Example research question: Does the education of parents (attained level, field) affect views on climate change?

Possible criteria to judge the hypothesis:

Criteria1: If at least one parent has technical secondary education, their children are more skeptical to climate change

Criteria2: If both parents have university degree, then their children are more likely to be active in climate change discussion

NOTE that exploratory and deductive (testing a hypothesis) research can be well combined in one research activity.

NOTE be careful not to miss any important (crucial) aspect of the issue concerned (based on preresearch). In other words make sure to ask questions relevant for the selected issue.

Q: Did we cover all the crucial aspects of the issue and based on our main goal of the investigation? Are we going to get the relevant answers to understand the issue to formulate conclusions (find explanation, discard or confirm the main arguments, find solution, etc.)

- *make sure to use the know-how about the actors involved and their perspectives and our biases learned in Activity 2*

III. Choosing the methods to be used (assignment and/or discussion)

Choosing the right method is actually answering following questions:

Q: How will be the research conducted (How will we do it)?

Q: What are the best ways (according our needs and resources) to collect the data and information to (the evidence)

- First decide whether you will do (need to do/can do) field research to get primary data or will just use secondary data based on desk research
- Choose quantitative or qualitative approach (or combination)
- See the methods field research described in Module 3
 - Basically most used for quantitative questions (How much? How many?) are surveys
 - Basically most used for qualitative questions (Why?) are interviews
- See sources on the internet for desk research described in Module 1

Provide students with [template A3&4-I Research design](#) to design the research for their [research goal](#) → [research questions](#) → [criteria](#) to judge the research questions upon:

Research design:

Criteria	Explanation of criteria	Method	Target group/source of data	Specification of target group	Source of contact for respondents / data
<i>Example:</i>					
Rising temperature	Hypothesis to be tested: the	Desk research	Statistics about the world	<i>+other relevant sources to be found</i>	Data set on available on website...



	temperature is rising	Statistical analysis	temperature (NASA) <i>+other sources</i>		
Impact on local businesses	Climate change has impact on local businesses	Interviews	10 business organizations in our town covering different categories	Representation of SME and large companies and main categories of business (depending on the structure in town)	The contacts from the company's web pages CEO of the company (or someone appointed by company to talk with us)

See more examples in the Module 3

IV. Prepare for the research realization (*assignment and discussion*)

In this phase the main activities include:

- For the **desk research**: collecting the documents, data sets etc.
- Preparation for the **field research**:
 - designing the questionnaires for surveys and interviews
 - remember the research criteria
 - concrete structure (topics of the questionnaire: what we need to know x not what all can we know)
 - formulating the questions
 - setting the scales (for surveys)
 - program the survey questionnaire if planned to be done on-line (e.g. use Google Forms)
 - getting the contact information to be able to reach the respondents
 - it might be useful to do so called piloting – using your research method on a small sample, reflecting on it and making changes if necessary (e.g. you find out that some questions are misunderstood)
 - prepare for the realization of the survey and interviews

V. Research realization (*assignment*)

- In this phase the main activities include:
 - Realization of the desk research – looking for sources and collecting the data and information
 - Realization of the field research
 - contacting the respondents to participate in the surveys and/or interviews and collecting data

See details how to conduct the research (use the concrete methods) in Module 3.



Give students time to gather data (help them if needed).

- *make sure to use the know-how about how to find reliable data on the internet learned in Activity 1*
 - *see Module 1 about required quality of data (relevance, validity, reliability of the source)*
- *see Module 3 about how to conduct research*
- *see Module 1 about how to collect reliable information on the internet*

VI. Analyze the data and assess the evidence *(assignment and/or discussion)*

- Analyze data collected in the research phase
 - Use descriptive **statistical methods** for quantitative data (see examples in Module 4)
 - Make synthesis of the qualitative data and information collected
- Based on evidence (data and information) that was collected during the research we should prove or dismiss the hypothesis:
 - ✳ Use **four tests to test the strength of the evidence** (see detail in the Module 4)
 - Straw in the Wind test
 - Hoop test
 - Smoking Gun test
 - Doubly Decisive test

Template A3&4-II Conclusions - asses hypothesis and arguments to design that can be used to asses hypothesis or arguments (from Module 4):

Hypothesis / Argument	Criteria (evidence to prove it)*	Data source**	Strength of the evidence	Explanation (understanding)
<i>Example:</i>				
<i>Formulate the hypothesis</i>	<i>What criteria are need to be full filed</i>	<i>Source of data</i>	<i>Test the hypothesis</i>	<i>How, why. Functions, process</i>
<i>Example 1: Climate change is occurring</i>	<i>..temperature is rising by xx degrees during the last xx years...</i>	<i>NASA, and xxx (other sources)...</i>	<i>Proven (passing Doubly Decisive test)</i>	<i>Explanation of what is happening and the mechanisms (see that those explanations might by themselves become hypothesis to be tested)</i>
<i>Example 2: Jon does not like me</i>	<i>John he has posted several hate comments on social media about me. I have confronted him and he</i>	<i>Social media posts Interview</i>	<i>Strong (passed Smoking gun test)</i>	<i>The reason Jong hates me based on the talk I had with him...</i>



	<i>acknowledged that he hates me</i>			
--	--	--	--	--

VII. Formulate conclusions based on findings from research and the evidence (*discussion*)

- Formulate **conclusions** – decisions to be made.
 - discuss with students what are the findings and conclusions from the research
 - you can discuss different **narratives** of the issue and perspectives of different actors
 - you can discuss how **different actors** influence the issue (what is their role)
 - you can **discuss biases** involved (see Module and Activity 2 for more detail)
 - when dealing with **conspiracy theories**: discuss with students
 - **IMPORTANT**: do not forget to **discuss the unknowns** (what do you still do not know or you would need more time/resources to find out)
- Ask students how further research (compared to the “first impression”) **changed their perspective** from their first impression – what changed, what was surprising, what stayed the same
 - discuss the role of the research in gathering knowledge on chosen topic
 - discuss what data and information the used methods actually bring (desk research, interviews, surveys)
 - concerning the desk research you can discuss the **quality of data** (sources) students encounter (remember the criteria for quality of data form Module 1)
- We recommend to do a check (*discussion*) with students whether all the **basic principles of making sense of information were followed** (see detail in the Module 4):
 - 🌟 **Consider all available data and information**
 - 🌟 **Consider all relevant aspects**
 - 🌟 **Coherence, causation**
 - 🌟 **Consistency in the principles**
 - 🌟 **Understand assumptions**
 - 🌟 **Acknowledge what we know and what we do not know**
- the goal is for the students to reflect the activity and to remember the key principles of making sense of information