

Indian Institute of Technology Bombay  
IDP in Educational Technology  
*Researcher Resources*

Resource – <i>Study-Planning-Template(SPT)</i>	Version 1.0, Dec 2013
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# Study Planning Template



# Study Planning Template

What have you done so far	Slide 3
Goals of this template	Slide 4
How to use the template	Slide 5
Approach	Slide 6

## Setup the Problem

7 – 14

What is your research goal?  
What is the problem you are addressing?  
Why is your problem important?  
Literature Survey  
    What prior work has been done?  
    Analyze prior related work.  
    What are gaps in prior work?  
What is your research study question?  
Check for consistency

## Explain your solution

15 – 25

What is your solution approach?  
Why is your method likely to work?

## Describe your study

26 – 45

Research Design?  
Sample?  
Procedure?  
Instruments?  
  
How do you plan to analyze your data?  
  
What ethical Guidelines will you follow?



# What have you done so far

In the Idea Proposal Template (IPT), you have already:

- Stated the teaching-learning problem to wish to solve, and your solution idea.
- Done a literature survey to identify related work.
- Analyzed the gaps in related work, that your idea addresses.
- Made an preliminary attempt to describe the procedure of your study to gather evidence for your idea.

Now, you need to describe your study in order to conduct it and gather evidence for your idea. You need to describe the methodology in detail, using correct terminology.



# Goal of this template (SPT)

This template will help you:

- Plan a systematic research study based on your idea from the IPT.
- Ensure that there is a logical flow in your study before you start executing the study.



# How to use this SPT

- There are **Instructions** and points written in each (white) slide to guide your thinking. Read these to answer the question posed.
- Write your answers to the questions in the worksheet slides with blue background and yellow box as shown below.

**TITLE : Contains a question like ... What is the procedure for your study?**

- Write your response to the above question within the yellow box provided.
- Use the instructions on the previous page (with the same title) to answer.

- Limit your response to one slide per question unless specified otherwise.
- Your responses should be such that your colleague should be able to follow your study's logic by simply reading these slides.

# Approach of this SPT

There are 3 sections in this template:

- I. Setup the problem (summary of your IPT response)
- II. Detail your solution (describe and defend your solution idea)
- III. Plan your study (the research methodology you will follow)

Answer the questions in each section to obtain a systematic research study plan.



Section 1

# **SETUP THE PROBLEM**

(Summarize your responses from IPT)



# Why setup the problem

- Recall the Novelty and Positioning sections [from TR-ET-2013.01.pdf](#)
- Merely describing what you have done is not sufficient to make it into a research article.

If you do not sell your problem well, the referee will not buy your solution.





# What problem are you addressing?

**Instruction:** Recall Q1 from the IPT: What teaching-learning problem are you trying to solve? Expand your answer to this question by doing the following:

- Describe the details of a teaching-learning scenario.
- Illustrate the problem with a example from your experience.
- Mention specifically - what aspect of the problem are you addressing?



# What problem are you addressing?

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# Why is your problem important?

## Instruction:

- In this slide write about “who requires your work”.
- You should be able to argue (based on literature that you surveyed in the IPT), or show evidence (using data) that the problem exists for your target population or users.



# Why is your problem important?

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# Summarize gaps in prior related work

## Instructions:

- Recall Questions 4, 5 & 6 of the IPT. You had surveyed related work, compared your idea with existing work and tried to identify a gap in related work.
- Now you need to state the gaps more precisely. Answer:
  - Is there an aspect of the problem that has not been addressed by prior work? If yes, state this gap.
  - For aspects of the problem that have been addressed, what are the gaps in existing solutions?



# Summarize gaps in prior related work

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What ethical Guidelines will you follow?



Section 2

# **DETAIL YOUR SOLUTION**

(Describe and defend your solution)





# What is your solution approach?

## Instructions:

Describe the details of your solution approach.

Expand your responses to Q2 in the IPT to answer this question.



# What is your solution approach?

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Add more slides if you need, to complete your description.

# Explain the relation of your solution to related prior work

## Instructions:

You should be able to show how your solution is different or better than existing work. Use your response to SPT Slide 14: ‘Summarize gap in related prior work’, and answer the following:

1) Which gap(s) does your solution attempt to address?

2) Does your solution extend existing work?

OR

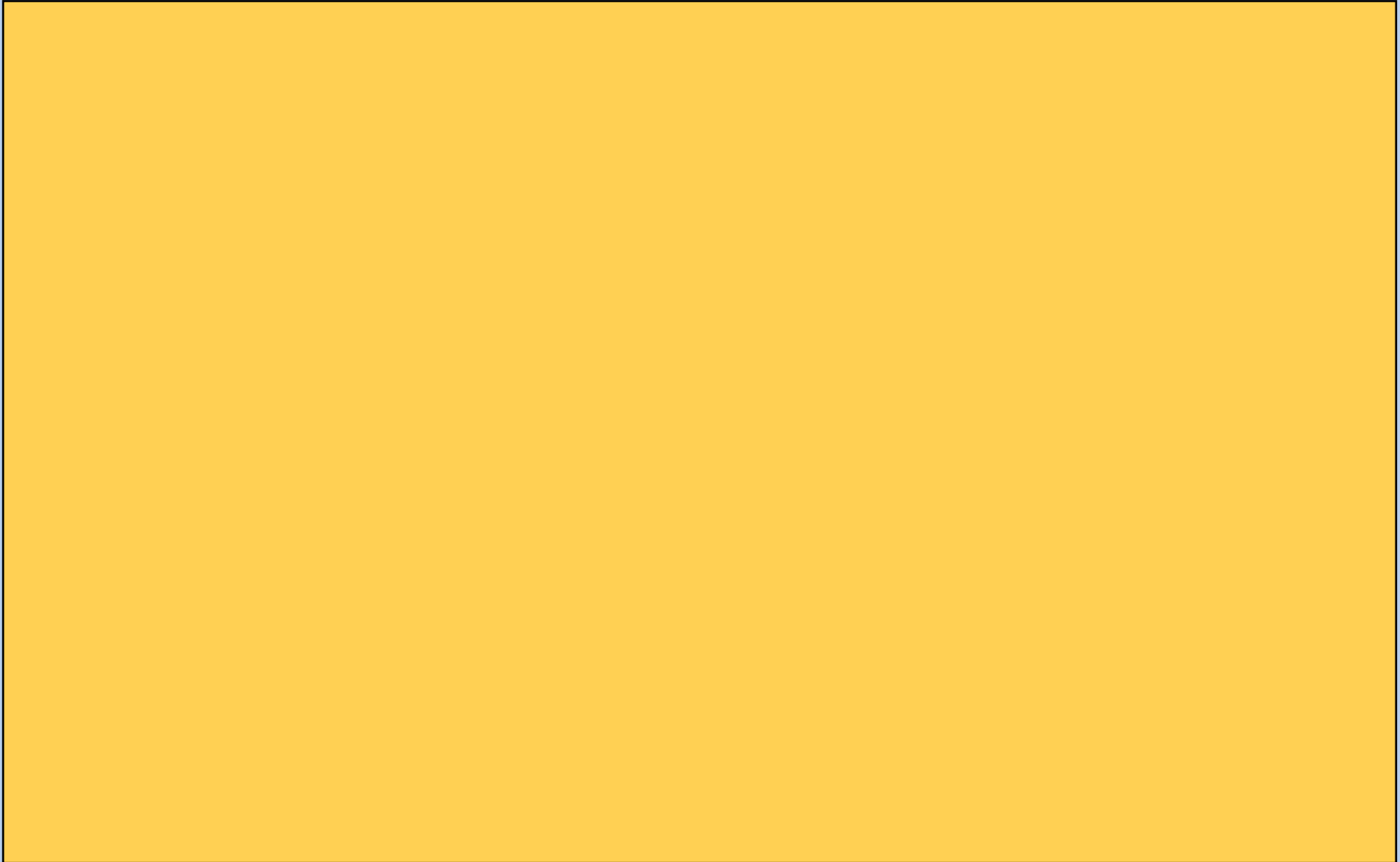
2) Does your work provide an alternative solution?

Refer to Section on “Positioning”(Point C in Part A) in TR-ET-2013-01.pdf.  
Your answer must aim to meet the ‘Better’ criterion in ‘Explain the relation to other work’



# Explain the relation of your solution to related prior work

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# Why is your method likely to work?

## Instructions:

Defend your solution approach (treatment / tool) using logical arguments. (Later you will defend it using data). You have to convince the referee:

- Is your treatment strategy or tool solving the problem?
- Is this treatment even worth experimenting?

Argue that the steps of your treatment are:

Sound (in some logical order)

Complete (cover all aspects of your stated problem)

Necessary (each step is required for the solution)

Sufficient (no additional critical steps are required)



# Why is your method likely to work?

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You can add more slides here to complete your argument.

# What are the details of your learning materials or tool?

As part of your solution, you may propose to create and use learning materials or develop a tool to address the problem.

## Instructions:

- If your solution is related to instructional strategies:

Describe what you will create as learning materials.

OR

- If you are developing a tool:

Describe detailed features that are relevant to the user.

Describe the architecture/modules used.

Draw diagrams to aid your description.



# What are the details of your learning materials or tool?

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You can add more slides here to complete your description.



# What are the boundaries of your solution?

## Instructions:

State the boundaries of your solution.

The boundaries could be related to :

- Domain (for ex: is my strategy / tool applicable to a specific topic / subject)
- Sample (for ex: is my strategy / tool targeting a specific group)
- Environment or context (for ex: am I assuming that my learning materials are to be used without teacher being present)
- ... etc



# What are the boundaries of your solution?

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28 – 48

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Instruments?  
  
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What ethical Guidelines will you follow?



Section 3

# PLAN YOUR STUDY

You will use answers to these questions in the research methodology section of your paper



# What is your research study question?

## Instruction:

Phrase your research study objective as **questions** at two levels –

- First level should be a question in broad terms that will be interesting to the reader.
- Second level should be one or more questions specific to the study being reported.

**Do not phrase the questions as sentences.**



# What is your research study question?

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# What is your research design?

**Instruction: Write the following.**

1) What is your Research Design? If you have developed a tool, how will you evaluate it?

2) Why is your Research Design suitable for your solution?

Refer to Guidelines C4 on “Research designs” from for more information on different research designs, when to use each, and their pros and cons.



# What is your research design?

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# What are your test-cases?

**Instruction: If your solution is the development of a tool, write the following. Else, move on to the next slide.**

- 1) What are your test-cases, that is, how will you show that your tool works correctly?
- 2) Why are your test-cases suitable? That is, argue how your study will test all aspects of your tool.



# What are your test-cases?

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# What is your sample?

**Instruction: Write the following.**

1) What is your sample, that is, who are the subjects in your study or users of your tool?

2) How will you select your sample? (this is called sampling strategy)

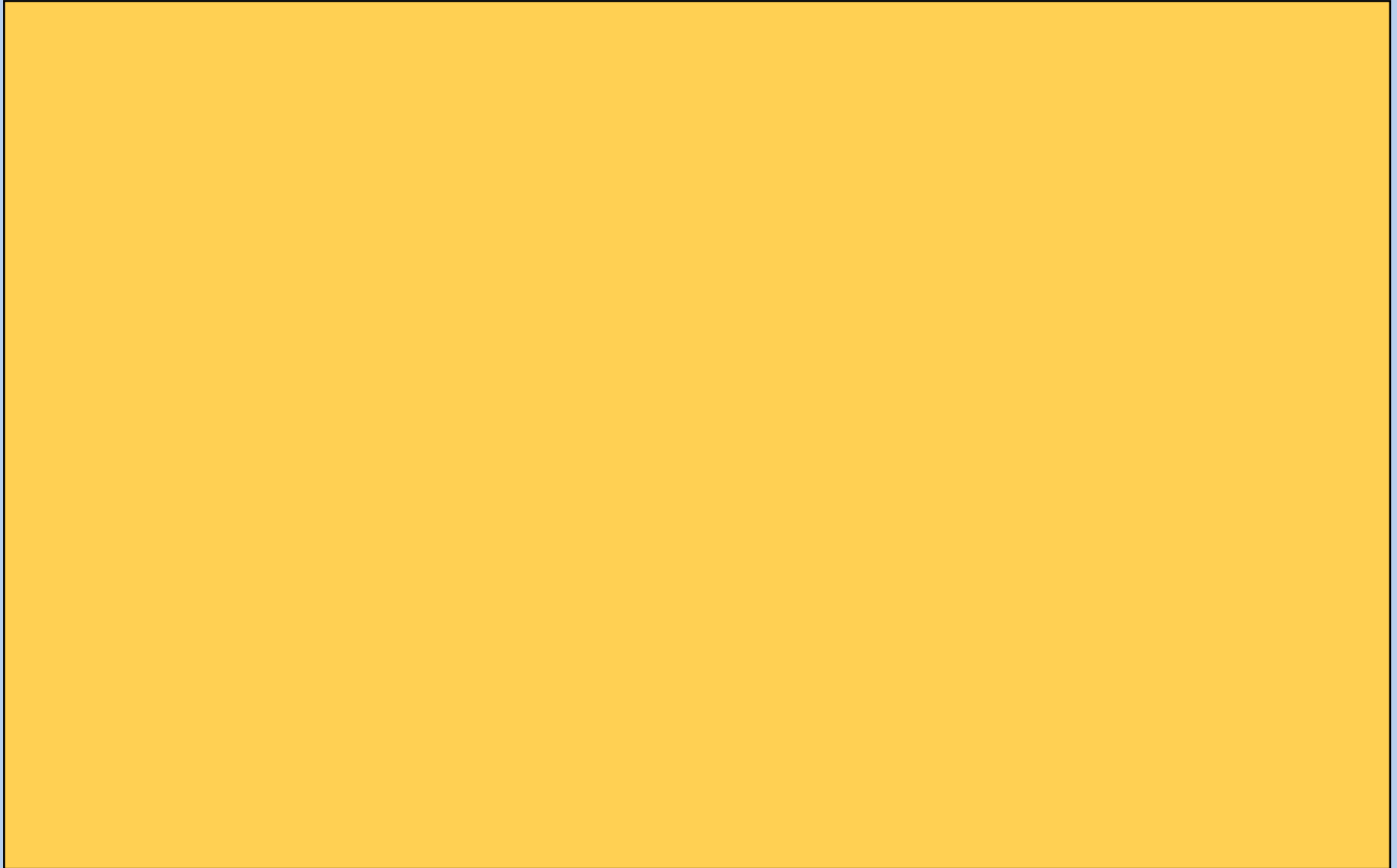
3) Why is your sample and your sampling strategy suitable? That is, argue how your study with the sample can be used to generalize towards the population identified in the broad-level question.

Refer to Guidelines C5 on “Research methods terminology” for more information on ‘sampling’.



# What is your sample?

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# What is the procedure for your study?

## Instruction:

Give sufficient detail about the procedure conducted for your study so that your colleague can replicate it.

**If your solution is an instructional strategy, Describe your treatment:**

What teachers do, what students do

Sequence and duration of activities

Stages of procedure (if any)

How you did group assignment (if multiple groups)

**If your solution is a tool, Describe your experiment:**

What users do; sequence and duration of activities

What other tool did you compare yours with (if any)



# What is the procedure for your study?

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# What are your measurements?

**Instructions: Write the following.**

- 1) What will you measure in your study?
- 2) How can you justify that these measurements are suitable to answer the problem you intend to solve?
- 3) **How will you triangulate your results?** That is, what other independent metrics will you use to corroborate the findings from 1) above?

Refer to Guidelines C7 on “Measurement metrics” for commonly used metrics to evaluate the effectiveness of strategies and tools.



# What are your measurements?

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# What are your instruments?

**Instructions:** Write how you will perform the measurements you stated in the previous slide. Specifically describe:

1) What are the instruments (such as questionnaires, tests) you will use to collect the data? Note - This instrument is NOT what students will use in class or lab (such as Matlab).

2) Why are these instruments suitable for your study?

3) How robust are the instruments? That is, what kind of reliability and validity tests can you show?

Refer to Guidelines C8 and C9 on “Creating instruments” and “Establishing validity and reliability of instruments” for creating and validating commonly used instruments in ET studies.



# What are your instruments?

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# How do you plan to analyze your data?

## Instructions:

1) Which descriptive statistics could you use to present the data in an organized manner? (such as means, histograms, correlations, etc.)

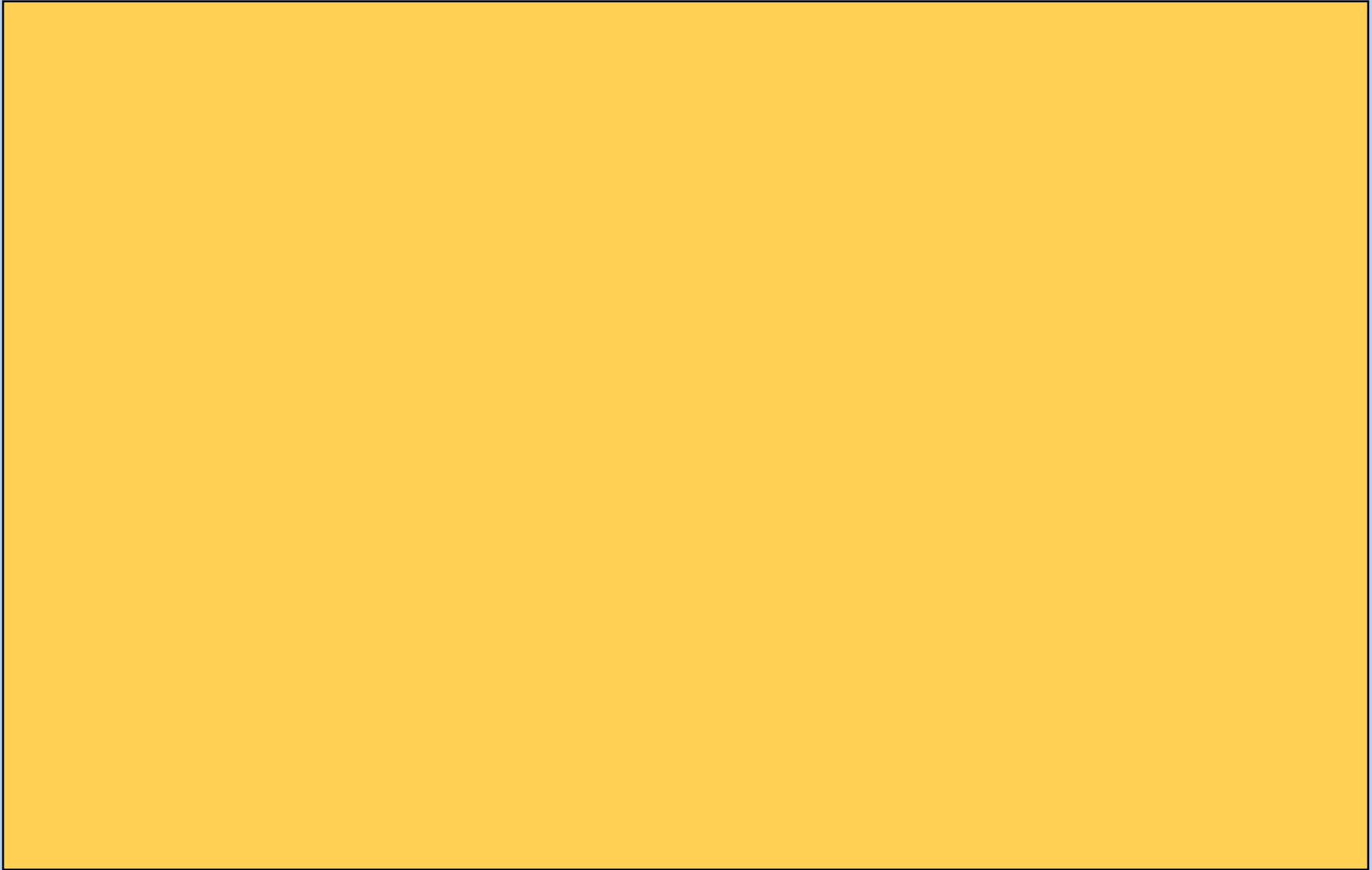
2) What analysis could you do to draw inferences, that is, to establish that your idea works? Write which statistical tests you will apply, and what exactly you can infer from the test.

Refer to Guidelines C10 on “Statistics” to choose and apply appropriate statistical techniques.



# How do you plan to analyze your data?

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# What ethical guidelines will you follow for conducting research with human subjects?

## Instructions:

Write what you ethical guidelines you will consider (such as asking participants to give informed consent), since you are conducting research with human subjects.

Refer to Guidelines C6 on “Ethics” for a list of important ethical considerations you should be aware of while conducting ET studies with human subjects.



# What ethical guidelines will you follow for conducting research with human subjects?

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# Threats to validity

## Instructions:

1) Identify possible reasons that can lead you to make incorrect inferences.

(For ex: In the case of a two-group controlled experiment, your inference that the treatment worked or did not work may be wrong if the two groups were not equivalent in other respects.)

2) Is there anything you can do to prevent this? If so, modify your study plan by making appropriate changes / assumptions.

(For ex: In the previous example, you need to ensure that group equivalence is established, say by means of a pre-test.)

Refer to Guidelines C12 on “Threats to validity” for a list of common threats you should be aware of while conducting ET studies.



# Threats to validity

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# Check for consistency

**Instructions:** Check whether:

- 1) The solution you have proposed (Step 1; Section I) is consistent with the initial teaching-learning problem you intended to address (Step 4; Section II). If not, make the two consistent.
- 2) The research questions that you have stated (Step 9; Section III) can be answered by the measurements (Step 13; Section III). If not, make the two consistent.
- 3) The research questions that you have stated can generate evidence for how well your solution addresses the problem. If not, make these consistent.



# Now, execute your study!

## Instructions:

You can go ahead and execute your study according to your plan in this SPT.

End of Resource: *Study-Planning-Template*

