

FORMULATE QUESTION

DESCRIPTION

- Contains **technology** in a **context** showing an **effect**.

GUIDELINES

- ▶ Create question using a structured approach such as PICOT.
- ▶ Validate question with FINER.

CHECKLIST

- ☐ Question systematically constructed
- ☐ Question's formulation validated

FORMULATE HYPOTHESIS

DESCRIPTION

- A testable prediction based on the question.

GUIDELINES

- ▶ Contains: two or more variables, context, relationship between the variables
- ▶ 'If I [do X], then [Y] will happen.'

CHECKLIST

- ☐ Hypothesis is formulated as prediction
- ☐ Prediction is testable

SEARCH FOR EXISTING EVIDENCE

DESCRIPTION

- Search for evidence related to the research question.
- Enlarge your Personal Evidence Pool.
- Deepen your understanding of the research domain.
- If necessary, incrementally refine the research question.

GUIDELINES

- ▶ Try to find as much relevant evidence as possible
- ▶ Use 'Cited by' function of search engines
- ▶ Read through found work's bibliography
- ▶ Refer to Systematic Literature Reviews for a wide comparison of related work
- ▶ Find similar work using classification systems such as CCS
- ▶ If looking for alternatives, use search engine's autocomplete
- ▶ Note search strings for more structured search approach
- ▶ Too few search results? Make Research Question more general
- ▶ Too many/general search results? Narrow down Research Question

CHECKLIST

- ☐ Rough understanding/overview
- ☐ Deep understanding
- ☐ Critical appraisal of relevant related work

**SUBSTANTIAL
EVIDENCE?**

DESCRIPTION

Check if Personal Evidence Pool contains enough substantial evidence to answer the Research Question.

EXPERIMENT

DESCRIPTION

- Design, Conduct and Evaluate Experiment.
- **TODO !recursive!**

GUIDELINES

- ▶ **TODO reference to [Experimenting in Software Engineering]**
- ▶ Use Briefing Form

CHECKLIST

- ☐ Experiment Designed
- ☐ Experiment Conducted
- ☐ Experiment Evaluated
- ☐ Briefing Form filled in

**ANSWER
QUESTION**

DESCRIPTION

- Accept or reject Hypothesis based on evidence.
- Answer the Research Question accordingly.

GUIDELINES

- ▶ Make sure evidence is substantial enough to answer the Research Question.
- ▶ Try to avoid bias. (Confirmation Bias, Information Expectancy Bias, ...)

CHECKLIST

- ☐ Hypothesis' validity is evaluated
- ☐ Research Question is answered



DISCUSSION

DESCRIPTION

- Discuss the whole study, suggest future approaches and limits.

GUIDELINES

- ▶ Critically assess study using EBSE checklist \cite[p. 62]{Dyba2005}.
- ▶ Put study in relation to larger context.

CHECKLIST

- ☐ Content of study critically assessed
- ☐ Study put in larger context

EVALUATE PROCESS

DESCRIPTION

- Reflect on your work in the previous steps and seek ways to improve your future performance.

GUIDELINES

- ▶ Use After Action Review and Postmortem Analysis\cite{Dyba2005}.

CHECKLIST

- ☐ AAR done
- ☐ PMA done
- ☐ Conclusions drawn for future processes