Example 1:

A researcher randomly assigns college students to a prescribed amount of study time. She plans to examine the extent to which study time leads to improved test scores.

RQ: **How does the amount of time spent studying influence test scores?**

1. Can you identify variables? If yes, how many?

   2 variables: amount of study hours and test scores

2. Can you identify independent variable?

   amount of study hours

3. Can you identify dependent variable?

   Test scores

4. Can you formulate a hypothesis?
   - Null Hypothesis

   Study time has no effect on test scores
   - Directional Hypothesis

   The students who spent more time studying will have higher test scores.

Example 2:

A researcher aims to investigate the relationship between the number of code reviews conducted during the software development process and the subsequent number of post-release defects scores.

RQ: **Does increasing the number of code reviews in a software development project have a significant effect on reducing the number of post-release defects?**

1. Can you identify variables? If yes, how many?

   2 variables: no. of code reviews and no. of post-release defects

2. Can you identify independent variable?

   no. of code reviews

3. Can you identify dependent variable?

   no. of post-release defects

4. Can you formulate a hypothesis?

   - Null Hypothesis

   Number of code reviews in a software development project has no effect on the number of post-release defects

   - Directional Hypothesis

   Increasing the number of code reviews in a software development project will lead to a decrease in the number of post-release defects

Jan: A fictional researcher

Which research method, will be chosen to achieve Jan's research objective???

Jan is a researcher, who is working on a "Defect Prediction" research project in order to evaluate a number of defect prediction models (constructed in the 1970s and 1980s) based on industrial data. There is a need to evaluate whether they are still applicable in the 2020s.

Research Objective:

To evaluate how well the models can predict the defect inflow from a number of industrial projects.

Jan: A fictional researcher

Which research method, will be chosen to achieve
Jan's research objective???

Design Science Research Method

The goal of the researcher is to assess whether old models are still applicable in practice. The researcher is not focused on the impact of the models in practice but on the quality of the models.

Sofie: A fictional researcher

Which research method, will be chosen to achieve Sofie's research objective???

Sofie has recently joined a research team, which set off to understand the dynamics of the defect inflow profiles in industry.

Research Objective:

To design and evaluate a method for predicting the number of defects reported per week.

Taken from: MIROSLAW. STARON. *ACTION RESEARCH IN SOFTWARE ENGINEERING: Theory and Applications*. SPRINGER, 2019.

Sofie: A fictional researcher

Action Research

The action/research team focused on solving an industrial problem of predicting the number of defects per week.

Taken from: MIROSLAW. STARON. *ACTION RESEARCH IN SOFTWARE ENGINEERING: Theory and Applications*. SPRINGER, 2019.