

Scientific Methods, Assignment 1

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Introduction

This is our handin for assignment 1.

1 Question 1

This section contains our answers to question 1 of the exercise.

“Which supervisor has which worldview? And how you came to that conclusion? Relate with characteristics mentioned in the lecture!”

We concluded that **supervisor A**’s worldview is **positivism**.

- *more prevalent in quantitative research* → Supervisor A proposes an experiment measuring the time to complete coding tasks and the number of correct tasks which reflects quantitative research.
- *start with a theory and test it* → Helen and supervisor A investigate whether TDD helps improving the speed and correctness of software development. The theory is tested by measuring the time to complete coding tasks and the number of correct tasks.
- *positivists are reductionist* → The proposed experiment aims to split the rather complex topic of ‘efficiency’ into two easily understandable metrics: time to complete a coding task and the number of correct tasks.
- *objectivity is key* → The experiment only measures numbers so that there is no subjectivity involved.

We concluded that **supervisor B**’s worldview is **constructivism**.

- *knowledge cannot be separated from its human contexts (experience and environment)* → TDD might work for some developers, but not for others. Hence, supervisor B proposes to check with experiences from the industry.
- *more prevalent in qualitative research* → Supervisor B proposes to have interviews with professionals from the industry which is a qualitative method.
- *less focus on testing theories, but more on understanding how people make sense of the world* → Instead of checking theories, supervisor B proposes check experiences, skills and the context that developers work in.
- *theory may emerge (inductive) but tied to the context* → Interviewing professionals from the industry might lead to some theory, however it will still be embedded in the industrial domain.
- *research findings is an interpretation shaped by the researcher’s own experience and background* → Helen will probably take the experiences collected from the interviews and combine them with her own experience of TDD. Also, she interprets her findings in a way that supports her hypothesis.

2 Question 2

This section contains our answer for question 2 of the exercise.

“Is there a better approach for Helen? If yes, why? If no, why? ”

It's not certain that one of the approaches is better than the other; more so that they elucidate the topic in different ways. Both supervisors suggestions are valid and help in exploring the efficiency of TDD but aim to do so in different ways, which also yield different results. Neither is necessarily better than the other.

Supervisor A's approach of testing TDD in a controlled environment would result in a conclusive measure of efficiency. However, the limitation of this approach is that it may not provide a realistic view of how TDD would perform against TLD in practice.

Supervisor B's approach on the other hand seeks to tackle this problem in a more holistic view by asking developers about their experience with it while being aware of the context of the developer's environment. The problem with this is that it may be difficult to get a conclusive, measurable result of how TDD's efficiency is compared to TLD.

Perhaps it would be beneficial to combine these approach using a pragmatic worldview where both can be explored. It would be interesting to do both and then compare the results.

In conclusion, Helen should determine whether she prefers one of the approaches over the other or finds one of the topics more exciting. Additionally, there may be other factors to consider, such as cost or time requirements.

3 Question 3

This section contains our answer for question 3 of the exercise.

“If it was up to you, how would you approach Helen’s thesis topic? Discuss in terms of philosophical worldview, research approach, possible methods and practices used? ”

If it were up to us we would adopt a pragmatic philosophical worldview. This would mitigate some of the limitations mentioned in question 2 and help us gain a more comprehensive understanding of TDD’s efficiency. The downside of this approach is that it is more complex and time-consuming.

Our approach would as such use a mix of qualitative and quantitative methods. We would use a qualitative approach to refine the definition of what efficiency is in context to developers. We would do so using interviews with individual developers. This approach aligns with a constructivist worldview, and is the first part of an exploratory sequential inquiry.

After we have properly understood the context we would go on to test the developers. Here we would also use a mixed approach.

We would quantitatively test TDD compared to TLD based on some key performance indicators in a controlled environment. While doing so we would perform interviews to see whether developers experiences in the real world match the findings. This would show whether the controlled tests align with the developers perceived efficiency of TDD compared to TLD. It would be advantageous to do these tests and interviews with the underlying context of the developer’s environment and experience in mind. This strategy of inquiry where we do controlled tests and interviews in conjunction would be convergent parallel as we care about seeing whether the results converge or diverge.