Questions to think about a problem differently

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1 Question

What simple questions can be used to think about a problem differently?

2 Answer

I've learned to solve problems by thinking about what I already knew. I would try to think of parts of the solution that might make sense and I would piece those parts together to get from the problem to the solution.

While I was doing some hobbyist research on AGI, I read George Pólya classic "How to Solve It". Pólya covers many of the questions I would ask myself implicitly, so I was glad to see that someone had taken the time to write them in a reusable format.

His four steps of 1. understanding the problem, 2. devising a plan, 3. carrying out the plan and 4. looking back will lead you to ask yourself what you know and don't know about the problem you are trying to solve. Doing so is similar to Feynman's technique, where you attempt to teach what you know to someone else and by doing so, are discovering the parts of your explanation that needs improvement.

What I liked the most about Pólya's approach was that he was comfortable working with partial solutions. If you couldn't figure out how to get to the end, it was still important to put forward all the tools you had at your disposition in order to attempt to solve the problem. This way you would be able to get an idea of what was lacking in your solution.

2.1 Understanding the problem

- What is not known yet?
- What data do you have?
- What conditions are there?
- Is it possible to satisfy all those conditions?

2.2 Devising a plan

- Have you seen this problem before?
- Have you seen a similar problem in a slightly different form?
- Do you know any related problems?
- Do you know something that could be useful to solve this problem?
- If you cannot solve this problem yet, can you solve a related problem?

2.3 Carrying out the plan

- Can you see clearly the steps from beginning to end?
- Can you prove that your approach is correct?

2.4 Looking back

- Can you check your solution?
- Can you get to your solution differently?
- Can you use your solution to solve other problems?

3 References

- How To Solve It - G. Polya