SKILLSUP

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# ANALYTICAL THINKING AND PROBLEM-SOLVING

## Table of Contents

# 1 THE OBJECTIVE – WHAT YOU WILL LEARN

In this session, you will learn:

- The importance of analytical thinking for problem-solving and decision making;
- What it means to be an analytical thinker;
- Basic steps of analytical thinking and problem solving;
- About effective problem-solving techniques in the workplace and in your daily life.

# 2 WHAT IS ANALYTICAL THINKING AND WHY IS IT USEFUL

Analytical thinking is a specific way of thinking that helps you effectively collect information and use it to find the best possible solutions to various problems.

Everyone can benefit from analytical thinking. It can be used in many situations, from work and school to everyday personal decisions like shopping or choosing a healthier diet.

If used correctly, analytical thinking will help you:

- Understand connections between information and occurrences;
- Recognise the validity of different information and arguments;
- Recognise the mistakes you make in your thinking and improve;
- Solve problems and make decisions effectively.

## 2.1 Importance of Analytical thinking in the workplace

Employers prefer workers with strong analytical thinking skills because they are independent, able to collect and understand information and solve problems quickly.

Analytical thinking is very useful and often needed in the workplace. Some examples:

- A cleaner must decide which cleaning product to use to remove a nasty stain from a carpet without damaging it.
- A manager must decide between two equally qualified candidates for a job.

- A driver must decide which road to take to reach his destination on time safely.

It is good to **promote your analytical thinking skills in your resume and during a job interview**. Use words and phrases like **problem solving**, **creativity** and **analytical** when describing your abilities. If you have previous work experiences, you can write something like "in my previous job I was tasked with selecting the right materials". If not, you can write something like "As an avid chess player, I developed strong analytical skills which I can apply in practical situations".

# 3 WHAT IT MEANS TO BE AN ANALYTICAL THINKER

Analytical thinkers are able **to collect information** and **do research to determine what is true and what is not**. Then they are able to use this knowledge to **solve big and small problems**. It also means that they are able to **think independently** and use **reason and logic** in their thinking.

To be an analytical thinker, you must always:

- Be an active observer and learner, not a passive consumer of information;
- Be open-minded and willing to hear all arguments and perspectives;
- Question ideas and information presented to us;
- Be critical of your own ideas, beliefs and actions to see if they can be improved;
- Try to determine if your solutions are truly the best or if they can be improved.

Being an analytical thinker also means that you **must be critical not only towards others but also with yourself**. You must be honest about your personal strengths and weaknesses and how they affect your decisions and actions and **being honest with yourself is not easy**.

**EXERCISE**

Think about the following questions:

- Do you think you are a good analytical thinker? Why do you think so?
- Can you remember the last time you used your analytical thinking?
- Do you find it hard to be critical about your mistakes?

# 4 ANALYTICAL THINKING AND PROBLEM SOLVING IN PRACTICE

When you are faced with a problem or you must make a decision, the most important thing is to form a clear picture of the situation by collecting as much information about the issue as possible and analyse it. This will allow you to make the best possible decisions and find the most appropriate solutions. In other words, you must be able to gather and critically examine the information relevant to the issue that you are dealing with. Here are some basic steps you should take.

## 4.1 Gathering information

If there is a problem that you must solve, you must first learn about it by gathering as much information as you can. You should read about it, talk to other people, and ask for their opinion and advice.

To do this you must be in **constant communication** with anyone who can give you useful information and advice.

## 4.2 Critically examining the information

**You should never believe something just because someone said so or you read it somewhere.** You must always try to find out if the information is actually true by researching it through:

- **Active listening** – When talking to someone you should always check if you understand what they are telling you by using active listening techniques such as paraphrasing.

- **Critical reading** – Critical reading is similar to active listening. A critical reader is trying to understand the meaning of the text by focusing on the details and asking questions such as “What is the text about?” or “What is the author trying to say?” After reading, the reader should be able to answer these questions.
- **Considering the source of information** – It is important to know where the information you got came from. Not all sources of information are reliable or trustworthy. Some people can deceive you because it benefits them or simply because they do not know enough about the issue at hand.

  **You should always be very careful when looking for information on the internet.** Information from experts such as scientists, doctors and professional journalists is always more reliable as advice from unknown persons who claim to know it all.

**EXERCISE**

Here is a simple method you can use to critically examine sources of information. Next time you read something or someone says something important to you ask yourself the following questions:

| | |
|---|---|
| **Who wrote or said it?** | Who is this person? Do they know what they are writing or talking about? Are they an expert or have relevant experience? |
| **What are their sources?** | How do they know if what they write or say about is true? Where did they read or hear about it? Is this their opinion or a fact? |
| **What are their intentions?** | What are they trying to achieve? Are they trying to help me or someone else? Are they trying to manipulate us? |
| **Are they representing themselves or somebody else?** | Did they write or say it because they believe it or because someone else told them to do it? Who is this other person and what are they trying to achieve? |

Using the examination questions above, you should be able to see which information is reliable and useful to you and which is bad and you should be careful about or ignore it.

## 4.3 Using logic and reason to understand the problem

After you determine which sources of information are reliable, you must use them to understand what the problem is and what is causing it.

Sometimes it is not easy to understand what the cause of the problem is. We often make wrong conclusions because we are not aware of the mistakes in our thinking. To avoid this, you must use logic and reason to find the true causes of the problems. Let us look at an example and try to use logic and reason to find a cause.

**EXERCISE**

**Example of false cause:**

All the computers at work have been working very slowly lately. You try to determine what the cause of the problem is. You think about it and remember that it started last Friday, which was Friday the 13th. You are convinced this is the reason because everybody knows that Friday the 13th brings bad luck.

Is this the best explanation? What is more likely, that your computers are cursed or that you have a computer virus? Logic and reason tell you that a virus is the real cause of the problem.

After you gathered enough information and have a basic understanding of the problem, there are some more questions that you should ask yourself to understand the problem and possible solutions even more. These six questions can be used in many different situations.

| | |
|---|---|
| **What is happening?** | Based on the information you have, you try to understand the situation and see if there are still questions you cannot answer. |
| **Why is it important?** | Ask yourself, what is the importance of the problem you are trying to solve? |

| | |
|---|---|
| **What don't I see?** | Ask yourself, is there anything else related to the problem that you are not seeing? |
| **How do I know?** | Think again how you know what you know and where your information came from. |
| **Who is saying it?** | Who gave you the information, what their position and motives are? |
| **Who else? What if?** | Are there any other ideas and possibilities you should consider? |

## 4.4 Additional research and conclusion

After answering the six critical questions above, you have two possibilities.

1. If you have all the necessary information to form a conclusion about the problem and decide how to solve it.

2. If the questions show you there are still some gaps in your understanding of the problem, you need to do some additional research to find more information you need.

If you decide to do more research, you must again gather information and then examine it critically again.

## 4.5 Foreseeing consequences and taking action

Before you decide to take action and solve the problem, you should think about how your decision will affect the people around you. **Being able to foresee the consequences of your decisions is one of the most important parts of problem solving.** Before you reach a decision and take action, you should think about the possible negative consequences and how you can avoid them or minimize their effects.

**EXERCISE**

Think about the following questions:

- Did you ever see or read something on the internet that turned out to be wrong?
- How often do you critically examine information to see if you can trust it?
- Did your actions ever have a negative impact? If yes, could you avoid it by planning?

# 5 EFFECTIVE PROBLEM-SOLVING STRATEGIES

## 5.1 Having a reachable goal

Some problems are simple and easy to solve while others are hard and complicated. When we have a big problem, we **must not surrender but find a realistic goal** that, when reached, **will make a problem smaller and manageable.**

For example, pollution is a big global problem, impossible to be solved by an individual, a town or even a country. However, if we decide that our goal is to reduce air and water pollution in our town or country by 50% in the next five years, and are successful, we made the problem smaller and more manageable.

## 5.2 Using creative thinking

Sometimes we cannot see a solution to a problem **because we are afraid to think creatively or "outside the box".**

What does "Thinking outside the box" mean? It means to:

- Not to be afraid to think differently than other people;
- Not to be afraid to look for and use new and unusual solutions;
- Listen to and respect ideas and suggestions from other people.

**EXERCISE**

**Example of "outside of the box" thinking:**

This problem demands creative or "outside the box" thinking to be solved. Add just one line to solve the mathematical problem below.

1 + 5 + 5 = 150

You can find the solution at https://www.storypick.com/think-out-of-the-box/

## 5.3 IDEAL problem-solving strategy

IDEAL is a common problem-solving strategy that can be used by an individual or by a team of people. Each letter in the name stands for one step in the process.

**I for Identify the problem**

- First, you must find out what the problem is. Talk to people to find out. Give everybody a chance to give their opinion.
- Try to define the problem in one short sentence.

**D for Define the goal**

- Decide if the problem can be solved entirely or in part? Define a result you want to achieve.

**E for Explore possible solutions**

- Answer these questions: What are some possible solutions? Which solution is the best one? Is it safe? Is it affordable? How it will affect the people involved? Is it fair? Will it work?

**A for Act**

- Make a plan of action and start working on the solution you decided is the best one.

**L for Look and learn**

- Observe how the solution is working out. Is it working? If not, go begin the process again and find a different solution. What did you learn from this process? Will you be able to use what you learned to prevent future problems?

This process does not always work exactly in this order, especially with more complicated problems. Sometimes you will find yourself going back and forth between the steps.

## 5.4 The 80/20 rule or the Pareto principle

The 80/20 rule states that 80 % of all benefits comes from 20 % of the work or that 80 % of the problems are caused by 20 % of the work.

This strategy is very useful when you are dealing with problems that have more than one cause. It helps you define and prioritize the problems that should be solved first to have the biggest positive effect on:

- Efficiency of the work process
- Improved productivity
- Improved profitability

Let us look at the steps of the 80/20 rule:

**1. Identify the problems and make a list** – Write down all the problems that you have. Always try to gather feedback from co-workers, customers or others who can provide useful information.

**2. Identify the main cause of each problem** – Examine each problem from different perspectives and find out what is causing it.

**3. Give a score to each problem** – Decide how important each of the problems is and score them accordingly. If your priority is to lower the costs, score the problems according to how much they cost.

**4. Group problems together according to their causes** – Look at the causes you determined for each problem and group the problems together by cause. For example, if three of your problems are caused by lack of staff training, put them in the same group.

**5. Add up the scores for each group** – Add up the scores for each group. The one with the highest score is the biggest problem and should be addressed first. The problem with the lowest score is the least important.

**6. Act** – Now start looking for solutions for your biggest problem. Use brainstorming, IDEAL, group discussion and other strategies to solve it. It is possible that you will find that the rest of the problems will no longer be an issue after you solve the biggest problem.

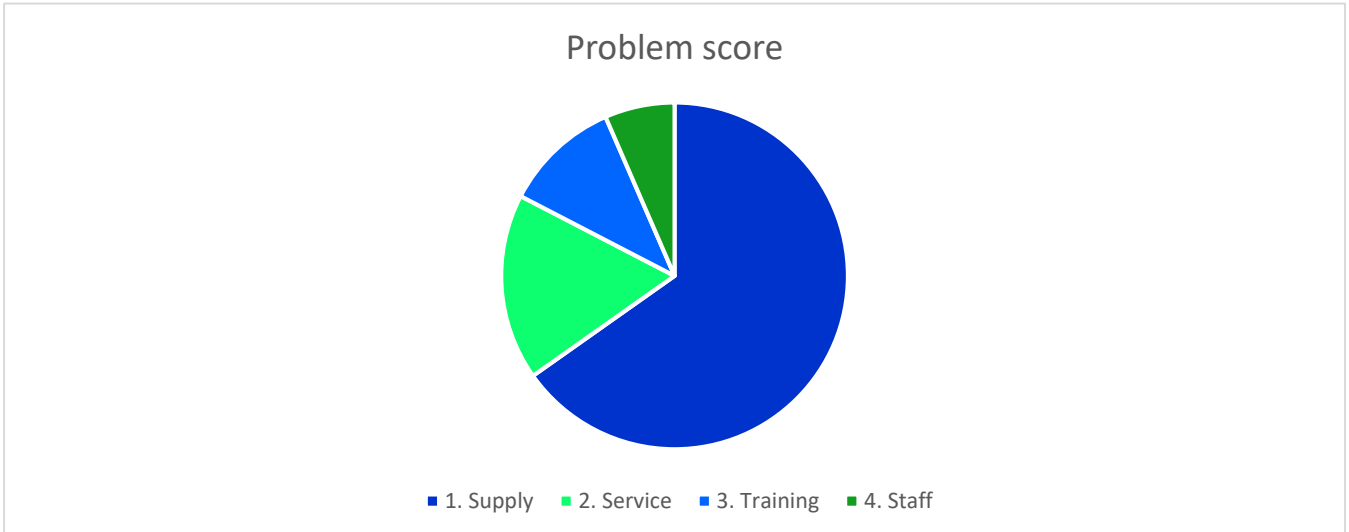
**EXAMPLE OF THE 80/20 RULE**

John manages a bakery. The bakery is not doing very well. There are many complaints from customers and staff and John is using the 80/20 rule to identify the biggest problems and their causes. He scores each problem according to the number of complaint he received from customers and the staff.

| | **PROBLEM** | **CAUSE** | **SCORE** |
|---|---|---|---|
| 1 | Customers are not served quickly enough | Poor customer service | 10 |
| 2 | Staff is unfriendly to the customers | Poor customer service | 6 |
| 3 | Staff is stressed and tired | Too few staff | 6 |
| 4 | Often there is a shortage of freshly baked bread | Supply shortages | 15 |
| 5 | Bread is often burnt | Lack of training | 10 |
| 6 | The bakers are complaining about flower shortages | Supply shortages | 20 |
| 7 | The supplier is often late delivering flower | Supply shortages | 25 |

John then groups the problems together by cause and ads up the scores.

1. **Supply shortages** (problem 4, 6 and 7) – 60 complaints
2. **Poor customer service** (problem 1 and 2) – 16 complaints
3. **Lack of training** (problem 5) – 10 complaints
4. **Too few staff** (problem 3) – 6 complaints



From the score, it is clear that the bakery will benefit the most if John first takes care of the supply shortages. He should also improve customer service but it is very possible that this will no longer be an issue after he takes care of supply shortages. Then he will also be able to see if lack of training and too few staff are actually an issue.

## 5.5 Group discussion

Group discussion is one of the simplest and most effective problem-solving strategies. It is suitable for all kinds of topics. It gives each member a chance to present their views, propose solutions to problems and vote for the best solution.

It is a good idea to have regular group discussions about various topics. In this way, you are not only finding high quality solutions but also promoting **teamwork** and improving **communication skills** of group members.

**EXERCISE**

Think about the following questions:

- Did you ever have a problem you could not completely solve? If so, did you set a realistic goal to make the problem more manageable?
- Do you have a favourite problem-solving strategy?
- Did you ever solve a problem by "thinking outside the box"?

## 5.6 How to improve your analytical thinking skills

You can do a lot to improve your analytical thinking skills. The point is to keep your mind active. Here are some fun and easy to do activities:

- **Read books:** Use active reading strategy. Read a few pages, then think, and analyse what you read. Try to find main motives, predict what will happen next, ask yourself questions and try to answer them.
- **Play brain games:** This is a fun way to become more analytical. Play games like Sudoku or chess, solve crosswords or puzzles.
- **Be curious:** Be interested about things. Ask questions about different things you see. This will help you improve your memory and problem-solving abilities.

- **Practice problem solving:** When you have a problem, try to think about various possible solutions to it. Try to visualize them and present them to others, if possible. If you can, try out different solutions to a problem.

You can also train your brain with various learning apps like Luminosity, Peak – Brain training, Eidetic and more.

# 6 CONCLUSION

Analytical thinking is a specific way of thinking that helps you collect and examine information and find the best solutions to various types of problems. It is useful when making simple everyday decisions as well as for solving problems in the workplace.

Employers like workers with strong analytical thinking skills because they are independent, know how to collect and examine information and solve problems.

What does it mean to be an analytical thinker? It means that you are able to collect information, understand it and use it to solve problems. It also means to think independently and use reason and logic in your thinking.

You must never trust something just because someone said so or because you read it somewhere and to always try to do research and find out what is actually true. This also means to be critical of your own actions and way of thinking and always look for way to improve. And being honest about your weaknesses and mistakes can be hard.

You can solve most problems by using analytical thinking skills. Before you make a decision how to solve a problem, you must first gather as much information about it as possible. Then you must examine the information critically to see what is true and useful and what is not. Before you act you must think about if there will be any negative impacts from your actions and how you can avoid or minimize them.

You can use many problem solving strategies. Some of the most common and useful are IDEAL, the 80/20 rule and group discussion. Some problems are very big and hard to solve. For problems like this, you need to be thinking “outside the box” and have a realistic goal to make them more manageable if you cannot solve them completely.

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