

EXERCISE 5 – THE IMPACT OF CRITICAL THINKING ON GREEN TECHNOLOGY DEVELOPMENT

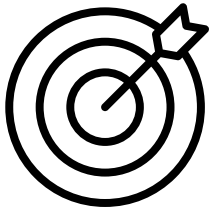


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Understanding how critical thinking influences green technology development and innovation.

Introduction to the topic



Explain how critical thinking supports the innovation process by evaluating different options, analysing risks and making informed and well-considered decisions

Critical thinking is the ability to objectively analyse and evaluate information in order to make an informed decision. It includes the ability to reason logically, identify biases and logical fallacies, and analyse arguments and evidence. Critical thinking is crucial in the innovation process as it allows you to break out of established thought patterns and develop new and creative solutions – you can use the ppt.



Give examples from other fields to show how critical thinking leads to breakthrough innovations

Critical thinking and the innovation process



Evaluation of the various options:



Innovation starts with the identification of a problem or need, and critical thinking enables a broad and in-depth analysis of different ways to solve it. Rather than adopting the first available solution, critical thinking encourages the exploration of different options, leading to more innovative outcomes



Example: In the technology industry, Steve Jobs and his team at Apple applied critical thinking to revolutionise the way people use mobile phones. Rather than accepting existing designs, they thought about different aspects of use and designed the iPhone as a device with a unique interface, combining the functions of a phone, music player and computer



Risk analysis:



Critical thinking also enables the assessment of risks associated with different options. In the innovation process, risk is inherent, but the ability to analyse it allows decisions to be made that minimise potential negative impacts



Example: In the pharmaceutical industry, research teams must conduct a critical risk analysis before bringing a new drug to market. Clinical trials are carefully planned to minimise the risks to patients while maximising the potential health benefits. Only through critical thinking can the right balance between innovation and safety be found



Making informed and well-considered decisions:



Innovation requires making decisions that can have long-lasting effects. Critical thinking ensures that these decisions are based on sound evidence and thorough analysis, rather than impulsive judgements or hunches



Example: Elon Musk, founder of Tesla and SpaceX, is known for making decisions that have revolutionised the automotive and space industries. His approach to innovation is based on careful technical and market analysis, which has led to the launch of high-performance electric vehicles and the development of reusable rockets that reduce the cost of space travel

- Discuss the importance of considering different options, assessing potential risks and anticipating benefits when making decisions in the green technology sector

Examples of well-argued decisions in the green technology sector



Provide 2-3 examples of decisions in the green technology sector that were well argued and had a positive impact on technology development and environmental protection



Explain what aspects of critical thinking have been applied to these decisions



Encourage participants to discuss the examples provided. Ask what other factors may have influenced these decisions

Group work – scenario analysis

Divide participants into 4 groups. Each group will be given one scenario on a green technology challenge, requiring critical thinking

You provide the group with instructions:

- ➔ Read the scenario and identify the main challenges and issues
- ➔ Analyse the options available to solve the problem, taking into account risks, benefits and long-term consequences
- ➔ Make a decision that you think is best argued and justify it using elements of critical thinking

Each group prepares a short presentation (5–7 minutes) presenting their chosen way of solving the problem and justifying their decision.

- ➔ Each group presents its scenario, analysis and chosen decision
- ➔ After each presentation, other groups may ask questions and express their opinions on the solution presented
- ➔ The educator summarises the results of the exercise, highlighting how critical thinking has contributed to better understanding and problem solving in the development of green technologies

Scenarios to be analysed

SCENARIO I

The Selection of Renewable Energy Technologies

The city is planning to switch to renewable energy sources. It has three technologies to choose from: solar panels, wind farms or geothermal. Each of these options has advantages and disadvantages, as well as different initial costs and long-term benefits.

Task for the group

- Analyse the options available in terms of cost, efficiency, environmental impact and potential risks

- Choose one technology that the city should implement and justify your decision

SCENARIO II

Reducing the company's plastic consumption

A large manufacturing company is trying to reduce its environmental impact, especially in terms of plastic consumption. It is possible to switch to alternative materials such as bioplastics or fully biodegradable packaging. However, each of these materials has different properties, production costs and environmental impact.

Task for the group

- ➔ Evaluate different alternatives to plastic, taking into account their environmental impact, production costs, and long-term durability

- ➔ Choose the best solution for the company and give reasons for your decision

SCENARIO III

Introduction of new recycling technology

A waste management company is considering a new recycling technology that would allow it to process a wider range of waste, including hard-to-recycle plastics. The technology is innovative, but comes with high upfront costs and operational risks.

Task for the group

- ➔ Analyse whether the investment in the new technology is worthwhile, taking into account costs, potential environmental benefits and implementation risks

- ➔ Decide whether to implement or reject the technology, justifying your choice

SCENARIO IV

Development of green urban infrastructure

The city plans to develop green infrastructure, including parks, rain gardens and green roofs on public buildings. The aim is to improve air quality and increase rainwater retention. However, there is a funding problem for all initiatives, forcing the selection of the most cost-effective projects.

Task for the group

- ➔ Evaluate the proposed initiatives in terms of their environmental impact, implementation costs and long-term benefits for residents

- ➔ Choose which projects the city should implement first and justify your choice

Exercise 5 – The Impact of Critical Thinking on Green Technology Development

Materials

- Flipcharts or whiteboards for recording group results
- Supporting information on critical thinking and decision analysis



Instructions for the educator

- ➔ Prepare materials on critical thinking and scenarios for analysis
- ➔ Make sure participants have access to the tools they need to work in groups (flipcharts, markers)
- ➔ Introduce participants to the topic of critical thinking and its importance in the development of green technologies
- ➔ While the groups are working, observe how the participants carry out the analysis and support them in identifying key aspects
- ➔ When presenting the results, ask questions to help participants gain a deeper understanding of the problems analysed and the decisions taken
- ➔ Draw attention to the variety of approaches and justifications, emphasising the importance of critical thinking in the decision-making process