



## Ill-Structured Problems and Problem Structuring

SP.248 2025

The NEET Experience



# What are Ill-structured problems?

- Authentic, real-world
- Multidisciplinary
- Complex, including multiple components and interrelationships
- Have multiple potential solutions
- Criteria for a good solution are inter-subjective and negotiable

Adapted from Checkland (2000) and Jonassen (2000)

# Examples of ill-structured problems

While GenAI can be leveraged to support student learning and higher-order thinking, relying too much on it for academic work may hinder students' ability to develop essential academic and professional skills. Critical thinking, independent research, and problem-solving abilities could weaken as students turn to GenAI for quick solutions instead of engaging deeply with course material. Over time, this dependence may reduce students' capacity to generate original ideas, synthesize information, construct well-reasoned arguments, and solve complex problems.

For [Biotech startup company], generating value and ultimate success both hinge on solving complex technological issues efficiently and accurately. Our process involves planning, conducting, summarizing, and reporting on experiments, including ordering reagents and primers designed by our software team. The current systems, procedures, and working habits in the company sometimes result in inefficiencies, unclear representation of experimental results, and loss/misrepresentation of experimental data.

In some large cities in China, numerous former rural villages are being rapidly urbanized along with the surrounding built environment due to the dualistic land system between urban and rural areas. These villages accommodate a large number of low-income migrants and are low-quality, high-density informal settlements. The crowded environment and hardening of roads in these villages aggravate the urban heat island effect, which is becoming worse due to increasingly frequent extreme heatwaves.

# Why is structuring problems important?

Trying to solve a problem without structuring it first may lead to suboptimal solutions or, even worse, to spending valuable resources and time on the wrong problem. This can lead to further detriments to the individual/team/organization, such as:

High cost of  
corrections

Diminished market  
share

High opportunity  
costs

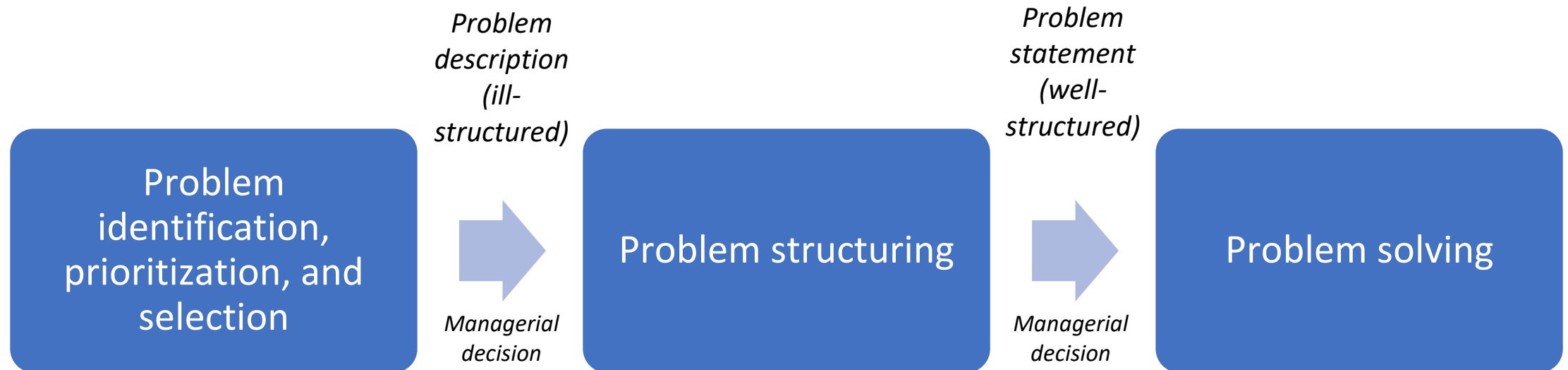
Lack of regulatory  
compliance

Damage to  
reputation

Resource  
misallocation,  
including wasted  
investment

Time delays

# Problem structuring's place in addressing ill-structured problems



# References

- D. H. Jonassen, "Toward a design theory of problem solving," *Educ. Technol. Res. Develop.*, vol. 48, no. 4, pp. 63–85, 2000.
- Lai, Yuan, and Rea Lavi. "Problem structuring in urban science education: Why, what, and how." *Frontiers of Urban and Rural Planning* 3, no. 1 (2025): 13.

# Your Problem Description

Undergraduate students at MIT choose their major during the second semester of the first year of their studies. While this choice is very important for students' future life and career, it is often done in a way that is rushed, unsystematic, and uninformed, leading to potentially negative effects down the road.

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