Constructivist Teaching in the Age of AI

Iwona Mokwa-Tarnowska

Constructivism

Focusing on what people do with information to develop knowledge

Actively constructing new meaning by integrating prior knowledge with new information

Sequencing learning materials

The crucial role of the environment in the process of accommodating new information

Engaging students in cooperation and collaboration

Developing self-reflective skills

Recognising that the learning process is not about providing ready-made solutions

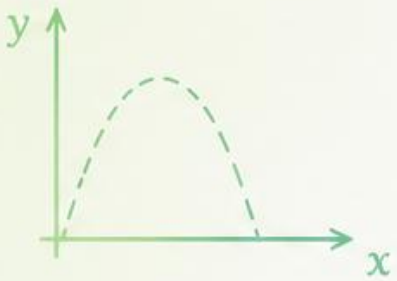
Understanding the way we see the world and conceptualise experiences

Content is not fixed but can be continuously modified and refined through learning and experience.

The learning process itself is important not the product.

Language enables interaction, communication, and the construction of knowledge.

In mathematics, learners develop understanding by exploring ideas, testing solutions, and making sense of their experiences.



$a^2 + b^2 = c^2$

Teachers are not experts or mentors who transmit knowledge to their students.

Teachers are moderators, facilitators, guides or partners who help learners investigate qualities, relationships or associations.

Authentic environment

Active learning

Collaboration

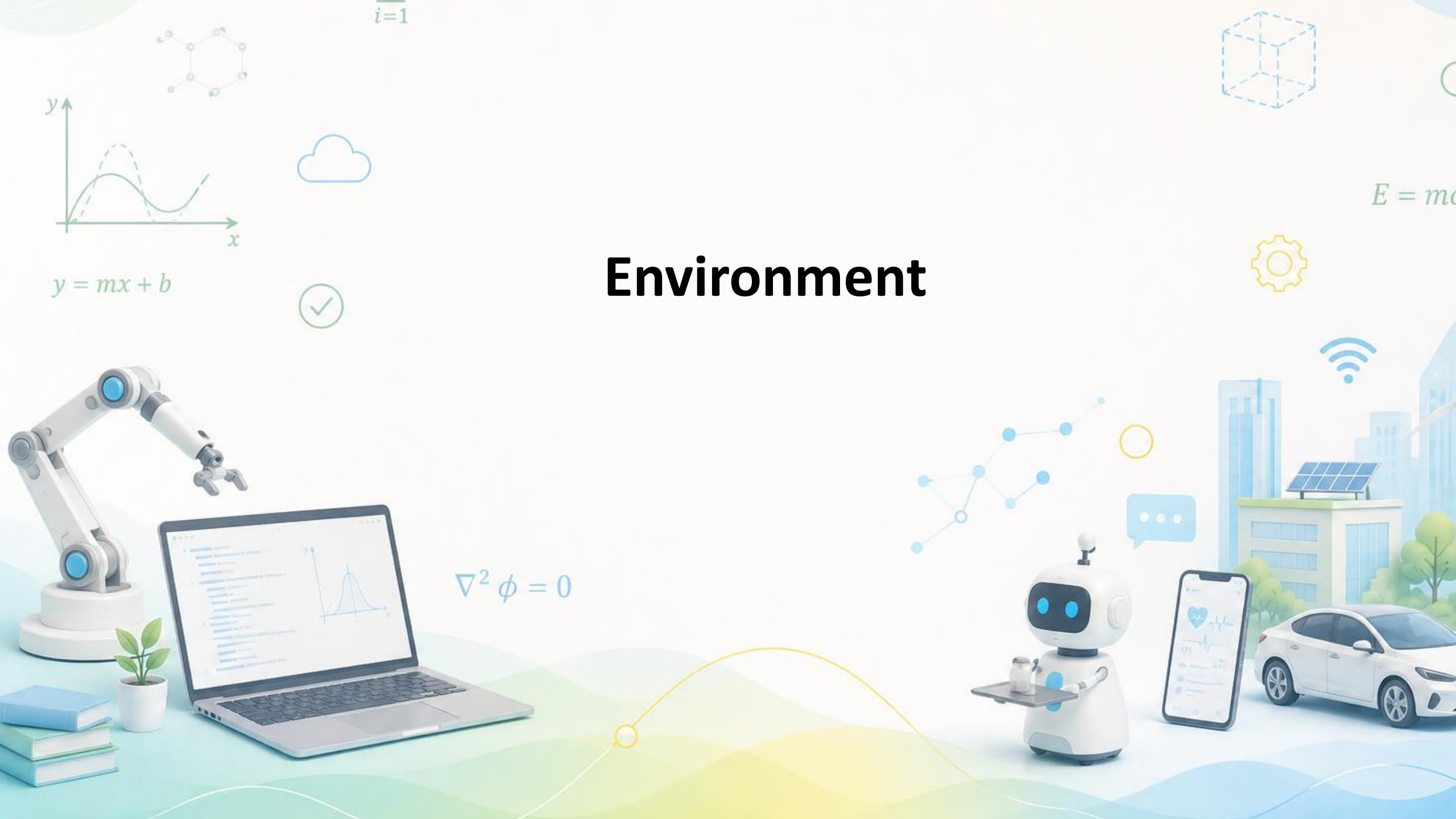
Discussions

Problem solving based tasks

Open questions

Formative feedback

Environment



Seymour Papert and Idit Harel

Constructionism

Muzzey Junior High School in Lexington, Massachusetts

Developing mathematical thinking and problem-solving skills through programming and creative exploration rather than rote memorisation

Prof. Vu Ha Van

Despite coming from top universities and having strong academic records, most new hires require several months of remedial training before they're job-ready.

Most students, even at U.S. universities, still view maths as something they need to pass rather than something they can use to think and solve problems.

Cranfield University, UK

Risk Assessment of a Task Using AI Scenario:

You work for a medium-sized airline operating a mixture of long- and short-haul routes from the UK to Europe and the Far East. You are the Head of Safety and Risk, and your CEO is attending an important meeting tomorrow about the impact of climate change on the airline's future operational safety. She has asked you to compile a ist of potential new hazards the airline may face in the next 10 years due to climate change. She acknowledges the short time you have available to carry out this research but expects you to make evidence-based recommendations based on the information you can gather quickly.

Your Task: Use an AI tool, such as ChatGPT, to assist you in this task.

Provide the following in your response:

A list of 5-7 potential hazards the airline may face due to climate change. For each hazard, include a brief description and its potential impact on the airline.

The specific prompts you used to guide the AI tool in helping you generate this list.

A critical reflection on the utility of AI tools for this type of work, including:

- Their strengths and limitations in identifying and analysing complex risks.
- How they compared to other methods you might use to identify such hazards.
- Your view of their utility and whether there is a place for these tools in the future of safety and risk management.

Word Count: Your response should be no more than 500 words.

Marking Guidelines: This question is worth 20% of the overall assignment mark. Marks will be awarded for:

The depth and relevance of the hazards identified (30%).

The clarity and quality of your descriptions of hazards and AI prompts (20%).

The quality of your reflection on the use of AI tools in this context, including critical insights and practical suggestions for improvement (50%).

Ethical Aspects of the Use of AI in Education

Academic Integrity and Assessment Authenticity
Equity of Access to AI Tools
Digital Literacy and Responsible AI Use
Accountability for AI-Generated Content
Intellectual Property and Copyright Issues
Dehumanisation of Learning and Human Interaction
The Role of Human Judgement in AI-Supported Education

May 2025

A Northeastern University student demanded an $8,000 refund after discovering that her professor had used AI tools to create course materials.

Thank you for your attention.

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