

AI Foundations and Applications

Category: Artificial Intelligence in Education

AI foundations and applications combines conceptual understanding of artificial intelligence with the capacity to use appropriate systems in real settings. It covers how data, algorithms and models contribute to outputs, alongside informed selection, operation and evaluation of AI applications. Foundational competence does not require advanced programming, but it does require precise vocabulary and critical judgement.

The term is used as a dimension of UNESCO's teacher competency framework. Its progression moves from acquiring basic knowledge and application skills towards adapting or creating AI-supported practices while retaining critical oversight ([Miao & Cukurova, 2024](#)).

Foundational Components

1. **AI concepts:** Distinguish AI from ordinary automation and recognise prediction, classification and generation tasks.
2. **Data:** Understand how collection, labelling, quality and representation affect what a system can learn.
3. **Models and inference:** Recognise that models identify patterns and produce outputs with uncertainty and limitations.
4. **Application selection:** Match a tool's capabilities and evidence base to a clearly defined educational purpose.
5. **Evaluation:** Test performance, usability, fairness and consequences rather than relying on promotional claims.

Examples in Practice

A lecturer considering an AI transcription service should distinguish speech recognition from language translation, examine performance across accents, review data-storage conditions and test the tool with representative recordings. The application is appropriate only if it improves access without creating disproportionate errors or privacy risks.

Why It Matters

Foundational knowledge makes AI less mysterious and supports better practical decisions. It helps users understand why two systems may behave differently, recognise limits in unfamiliar contexts and select proportionate safeguards for the people, data and tasks involved, and explain those safeguards clearly to others ([OECD, 2022](#)).

Further Reading

6. Miao, F., & Cukurova, M. (2024). [AI competency framework for teachers](#). UNESCO.
7. Russell, S. J., & Norvig, P. (2021). [Artificial Intelligence: A Modern Approach](#) (4th ed.). Pearson.
8. OECD. (2022). [OECD framework for the classification of AI systems](#). OECD Digital Economy Papers, No. 323.

Related Terms: AI Literacy | Machine Learning | Data Literacy | AI Techniques and Applications