



Centrul de ID/IF și eLearning

# Integrating AI Technologies in Education and AI-driven Teaching and Learning Methods

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E<sup>3</sup>UDRES<sup>2</sup>



Timișoara 2023  
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# Actioning the UNESCO Recommendation

A 'human-centred and pedagogically appropriate interaction' approach

six perspectives to consolidate pedagogically appropriate interactions and the prioritization of human agency:

- appropriate domains of knowledge or problems;
- expected outcomes;
- appropriate GenAI tools and comparative advantages;
- requirements for users;
- required human pedagogical methods and example prompts; and
- ethical risks.

**Guidance for generative AI in education and research, UNESCO, 2023**

<https://unesdoc.unesco.org/ark:/48223/pf0000386693>

# Actioning on EU Digital Competences Framework DigComp 2.2



What *knowledge, skills and attitudes* do citizens need to **engage with AI systems** in a **confident, critical and responsible** way for learning, at work, and for participation in society?

<https://publications.jrc.ec.europa.eu/repository/handle/JRC128415>

See more at: <https://ec.europa.eu/jrc/digcomp>

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<https://education.ec.europa.eu/focus-topics/digital-education/action-plan/european-digital-education-hub>

[https://ec.europa.eu/eusurvey/runner/EDEH\\_registration](https://ec.europa.eu/eusurvey/runner/EDEH_registration)

# EU AI report the European Digital Education Hub's Squad on artificial intelligence in education

- **Teachers' Competences**
- Competences for Teaching for AI
- Competences for Teaching with AI
- Competences for Teaching about AI
- **How to Support Teachers to Use AI in Teaching**
- **Use Scenarios & Practical Examples of AI Use in Education**
- Teaching for AI
- Teaching for AI
- Teaching with AI

# EU AI report the European Digital Education Hub's Squad on artificial intelligence in education

- Education about AI
- Influence of AI on Governance in Education
- AI and Ethics, Human Rights, Law and Educational Data
- Teaching with AI - Assessment, Feedback and Personalisation



# Educator considerations for ChatGPT from OpenAI

Some examples of how we've seen educators exploring how to teach and learn with tools like ChatGPT:

- Drafting and brainstorming for lesson plans and other activities
- Help with design of quiz questions or other exercises
- Experimenting with custom tutoring tools
- Customizing materials for different preferences (simplifying language, adjusting to different reading levels, creating tailored activities for different interests)
- Providing grammatical or structural feedback on portions of writing
- Use in upskilling activities in areas like writing and coding (debugging code, revising writing, asking for explanations)
- Critique AI generated text

<https://platform.openai.com/docs/chatgpt-education>

“Am I even necessary now?”

## Don't Ban ChatGPT in courses. Teach With It

([Roose, 2023](#))

- Summarizing articles
- Conversational practice. Clarifying Topics
- Vocabulary building
- Writing practice. Writing assistance: brainstorming or creating first drafts, Write a book review, a play-script
- Reading comprehension
- Practice communication and pronunciation skills
- AI invents dialogue, story, essay, emails, scripts for movies, book reviews, discourses, CV
- Flashcards, quizzes,
- Speech and presentations.
- Digital storytelling
- Q&A session
- Language translations. Language Discussion partner
- ...



# Get creative with your assignment

(examples for ChatGPT)

**Prompt competition:** Ask students to individually write a prompt for chatGPT to answer the major question.

**Reflect and Improve:** Using Track Changes in MS Word or Suggesting in Google Docs, have students improve the output of chatGPT (e.g., correcting errors or misinformation, **expanding on shallow content**).

**Re-vision:** Have students revise (write again) ChatGPT's output from a different angle. For instance, take a different perspective, apply a critical lens, expand on a particular concept, or correct aspects of the output that could cause their peers to misunderstand or misinterpret.

**Dual-Assignments:** Give students a choice between two versions of the same assignment. One version for those that want to use chatGPT and one for those who don't.

**Mind-Maps // Debates // Videos or Podcasts (with caution)**

# AI Use in education

The need to respect copyright and not use material without the author's permission.

Ensuring that digital assessment is fair and impartial, with the same standards and assessment criteria as traditional assessment.

The need to clearly provide students with instructions and expectations regarding assessment, to be clear about what is expected of them and how they will be assessed.

Assessment based on skills and not just memorization of information.

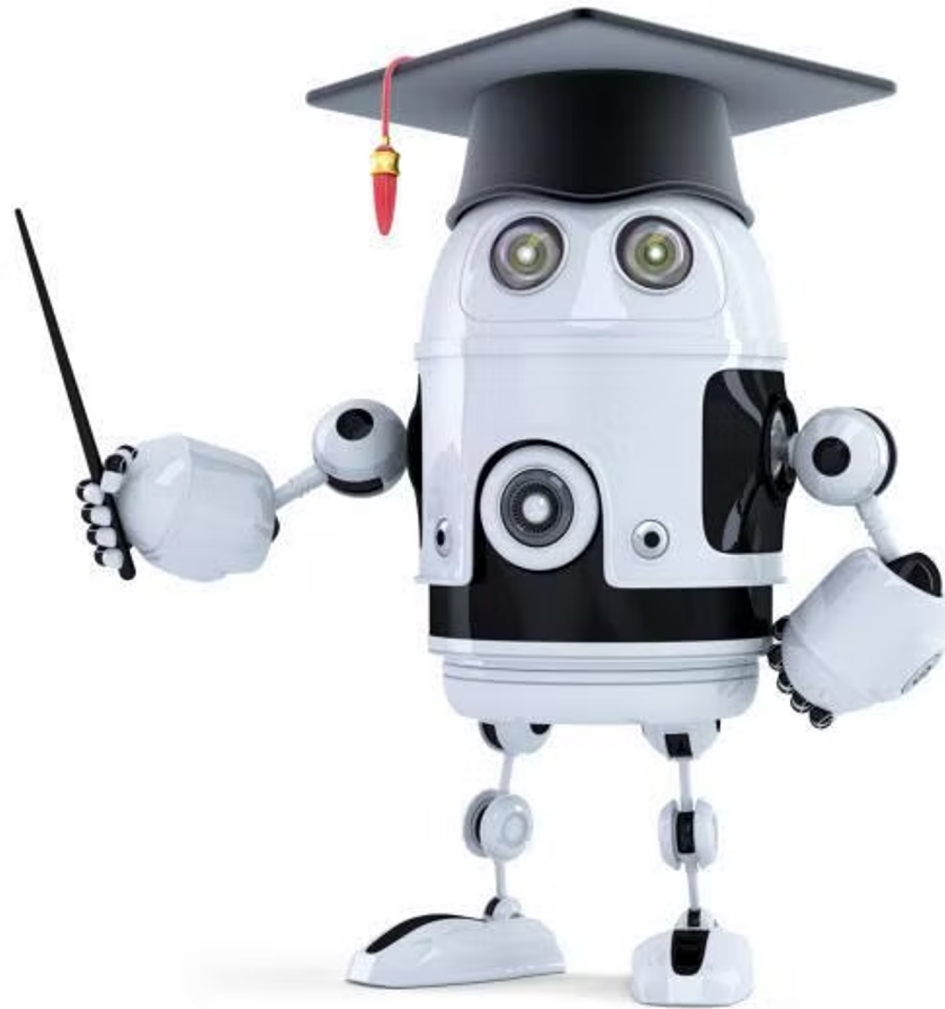
Using technology (see Generative AI-ChatGPT) to improve assessment and provide rapid and personalized feedback to students.

Open and transparent communication with students about the plagiarism policy and the consequences of unauthorized use of online resources.

# Using ChatGPT (or other generative AI tools) for teachers

## TEACHER

- Generating practice problems
- Creating lesson plans
- Generating personalized feedback
- Creating study guides
- Generating visual aids
- Personalizing learning
- Generating exam questions
- Creating interactive simulations
- Providing virtual tutoring
- Creating multimedia projects



# Using ChatGPT (or other generative AI tools) for students

## STUDENT

Research assistant  
(generating research  
topics)

Creating lab reports

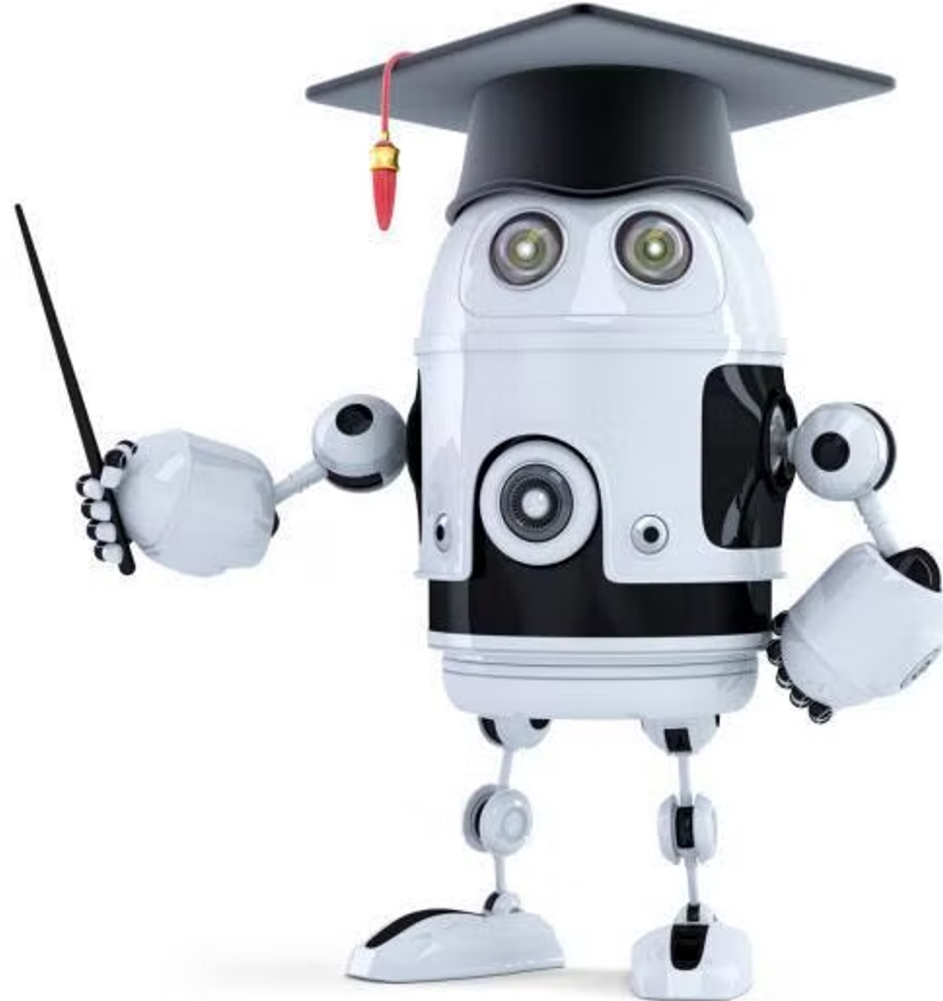
Practicing coding

Digital Tutor

Generating study  
materials

Problem-solving

Creating multimedia  
projects



# Drawbacks in STEM education?

- Over-reliance on technology
- Creativity (if used corectly)
- Lack of personalization
- Limited scope of content
- Potential for bias
- ...



# AI in research



# Can an AI chatbot be the author of a scholarly paper?

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## Research Article

# Chatting and cheating: Ensuring academic integrity in the era of ChatGPT

Debby R. E. Cotton , Peter A. Cotton   & J. Reuben Shipway 

Published online: 13 Mar 2023

Download citation | <https://doi.org/10.1080/14703297.2023.2190148> | Check for updates

Full Article | Figures & data | References | Citations | Metrics | Licensing | Reprints & Permissions

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### In this article

- ABSTRACT

## ABSTRACT

The use of artificial intelligence in academia is a hot topic in the education field. ChatGPT is an AI tool

Related research 

- People also read
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Cotton, D., Cotton, P. A., & Shipway, J. R. (2023b). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*, 1–12. <https://doi.org/10.1080/14703297.2023.2190148>

# Can an AI chatbot be the author of a scholarly paper?

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## Best Practices for Using AI When Writing Scientific Manuscripts

### Caution, Care, and Consideration: Creative Science Depends on It

Jillian M. Buriak\*, Deji Akinwande, Natalie Artzi, C. Jeffrey Brinker, Cynthia Burrows, Warren C. W. Chan, Chunying Chen, Xiaodong Chen, Manish Chhowalla, Lifeng Chi, William Chueh, Cathleen M. Crudden, Dino Di Carlo, Sharon C. Glotzer, Mark C. Hersam, Dean Ho, Tony Y. Hu, Jiaying Huang, Ali Javey, Prashant V. Kamat, Il-Doo Kim, Nicholas A. Kotov, T. Randall Lee, Young Hee Lee, Yan Li, Luis M. Liz-Marzán, Paul Mulvaney, Prineha Narang, Peter Nordlander, Rahmi Oklu, Wolfgang J. Parak, Andrey L. Rogach, Mathieu Salanne, Paolo Samori, Raymond E. Schaak, Kirk S. Schanze, Tsuyoshi Sekitani, Sara Skrabalak, Ajay K. Sood, Ilja K. Voets, Shu Wang, Shutao Wang, Andrew T. S. Wee, and Jinhua Ye

Cite this: ACS Nano 2023, 17, 5, 4091–4093  
Publication Date: February 27, 2023  
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ACS Nano

PDF (1 MB)

SUBJECTS: Biological databases, Chemical structure, Mathematical methods, Optical properties, Vinyl

<https://pubs.acs.org/doi/10.1021/acsnano.3c01544>

Science is communicated through language. The media of language in science is multimodal, ranging from lecturing in classrooms, to informal daily discussions among scientists, to prepared talks at conferences, and, finally, to the pinnacle of science communication, the formal peer-reviewed publication. The arrival of language tools driven by artificial intelligence (AI), like ChatGPT, (1) has generated an explosion of interest globally. ChatGPT has set the record for the fastest growing user base of any application in history, with over 100 million active users in just two months, as of the end of January 2023. (2) ChatGPT is merely the first of many AI-based language tools, with announcements of more either in preparation or soon to be launched. (3–5) Many in scientific research and universities around the world have raised concerns of ChatGPT's potential to transform scientific communication (6) before we have had time to consider the ramifications of such a tool or verified that the text it generates is factually correct. The human-like quality of the text

Figures References

This publication has no figures.

## Our recommendations for the use of AI language bots for scientific communication:

- (i) Acknowledge, in the Acknowledgments and Experimental Sections, your use of an AI bot/ChatGPT to prepare your manuscript. Clearly indicate which parts of the manuscript used the output of the language bot, and provide the prompts and questions, and/or transcript in the Supporting Information.
- (ii) Remind your coauthors, and yourself, that the output of the ChatGPT model is merely a very early draft, at best. The output is incomplete, might contain incorrect information, and every sentence and statement must be considered critically. Check, check, and check again. And then check again.
- (iii) Do not use text verbatim from ChatGPT. These are not your words. The bot might have also reused text from other sources, leading to inadvertent plagiarism.
- (iv) Any citations recommended by an AI bot/ChatGPT need to be verified with the original literature since the bot is known to generate erroneous citations.
- (v) Do not include ChatGPT or any other AI-based bot as a co-author.<sup>10,19</sup> It cannot generate new ideas or compose a discussion based on new results, as that is our domain as humans. It is merely a tool, like many other programs, for helping with the formulation and writing of manuscripts. Please refer to *ACS Nano* [author guidelines](#) for more information.
- (vi) ChatGPT cannot be held accountable for any statement or ethical breach. As it stands, all authors of a manuscript share this responsibility.
- (vii) And most importantly, do not allow ChatGPT to squelch your creativity and deep thinking. Use it to expand your horizons, and spark new ideas!

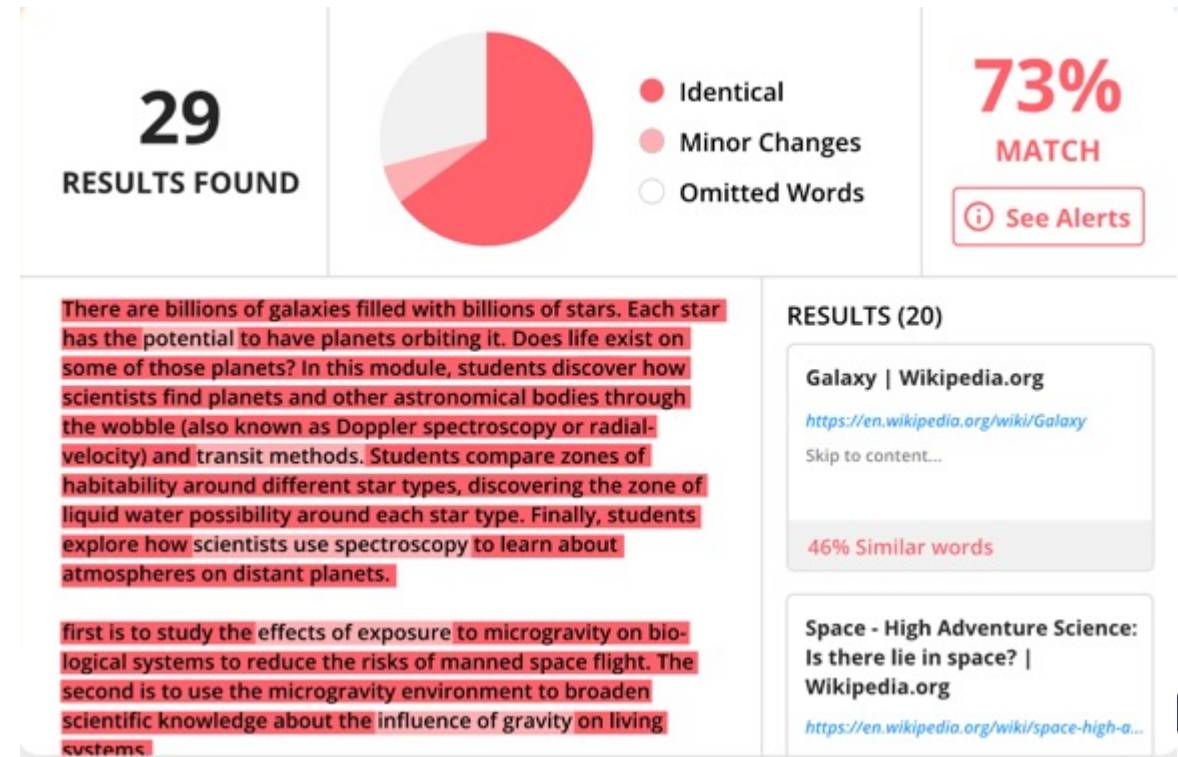
## Can an AI chatbot be the author of a scholarly paper?

Buriak, Jillian M., et al. "Best Practices for Using AI When Writing Scientific Manuscripts: Caution, Care, and Consideration: Creative Science Depends on It." *ACS nano* 17.5 (2023): 4091-4093. <https://pubs.acs.org/doi/10.1021/acsnano.3c01544>



# Plagiarism detectors

[Turnitin](#) (Integrate [AI Writing Detector](#) into Its Products since April 2023), [ithenticate](#), [Grammarly Plagiarism Checker](#), [AI Text Classifier](#), [GPTZero for Educators](#), [CrossPlag](#), [AI Content Detector](#), [Originality.ai](#), [DetectGPT](#), [Ai Writing Check](#), [PlagiBot](#), [Writer.com](#), [Plag](#), [PlagiarismCheckerAI](#)




# AI in Turnitin

The screenshot shows the Turnitin Feedback Studio interface. At the top, the user is identified as Silviu Vert, and the document is titled 'IEEE Open Cipri Radu'. The document content includes an introduction to digital imaging and a section on image enhancement techniques. A notification pop-up is displayed in the center, stating: 'New messaging for scores under 20%. As a result of customer feedback and additional testing, we learned that AI writing detection results under 20% have a higher incidence of false positives. In order to reduce the likelihood of misinterpretation, we have changed the AI indicator to contain an asterisk for percentages less than 20 to call attention to the fact that the score is less reliable. It is essential to understand the limitations of AI detection before making decisions about a student's work. We encourage you to learn more about Turnitin's AI detection capabilities before using the tool.' The AI score for the selected text is shown as 4%.

This screenshot shows a different view of the Turnitin Feedback Studio interface, displaying a document from ResearchGate. The document content is similar to the first screenshot, discussing image enhancement techniques. A notification pop-up is also present, providing the same message about AI detection scores under 20%. The AI score for the selected text is shown as 4%.





# Co-create to control and benefit from Generative AI in Education

Regulation

Adopt

Use cases

Learn



# AI Courses & Guides

# AI Courses & Guides

The screenshot shows the IEEE Academy on Artificial Intelligence (AI) website. The header includes the IEEE logo and navigation links: Home, Education, IEEE Academy. The main content area features the IEEE Academy logo and a description of the program. A sidebar on the right lists 'On this page' with links to 'Technical areas' and 'Contributors'. A 'Start Learning Now' button is visible. Below the main text, there is a section for 'Technical areas' with a list of topics: Classic AI and Modern AI (Machine Learning, Deep Learning).

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Home > Education > IEEE Academy

## IEEE Academy on Artificial Intelligence (AI)

Related information

### IEEE Academy™ Artificial Intelligence

The IEEE Academy on Artificial Intelligence provides basic knowledge on classic AI, modern AI (machine learning), humanized computing, and semantic computing. On top of the basic modules, it introduces the applications of AI in different verticals such as manufacturing, financial, health, education, etc. by defining the problems and identifying possible AI solutions based on existing and newly developed materials. The learner is guided through a logical continuous path that better ties the concepts and materials together.

The Academy is primarily for members who work in industry and need to understand new technical information quickly so they can apply it to their work. At the completion of the IEEE Academy on Artificial Intelligence, the learner will be able to demonstrate their new knowledge and will earn a certificate.

[Start Learning Now](#)

#### Technical areas

- Classic AI
- Modern AI (Machine Learning, Deep Learning)

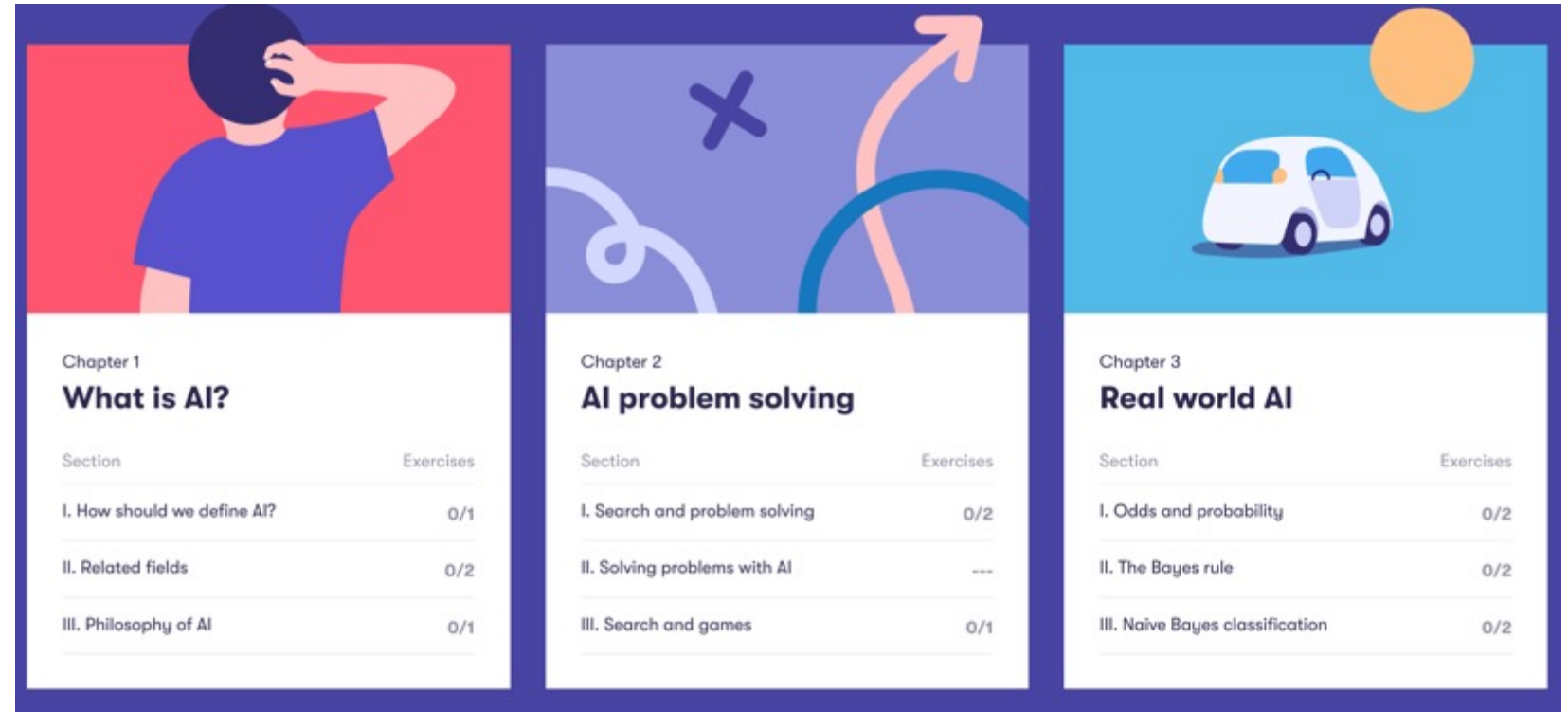
The IEEE Academy on Artificial Intelligence provides basic knowledge on classic AI, modern AI (machine learning), humanized computing, and semantic computing.

# AI Courses & Guides

## Elements of AI

<https://www.elementsofai.com/>

<https://course.elementsofai.com/>



The image displays three course cards from the 'Elements of AI' series, arranged horizontally. Each card features a distinct header image: a person thinking, mathematical symbols, and a car. Below each image is a table listing the course sections and the number of exercises completed for each.

Section	Exercises
<b>Chapter 1</b>	
<b>What is AI?</b>	
I. How should we define AI?	0/1
II. Related fields	0/2
III. Philosophy of AI	0/1

Section	Exercises
<b>Chapter 2</b>	
<b>AI problem solving</b>	
I. Search and problem solving	0/2
II. Solving problems with AI	---
III. Search and games	0/1

Section	Exercises
<b>Chapter 3</b>	
<b>Real world AI</b>	
I. Odds and probability	0/2
II. The Bayes rule	0/2
III. Naïve Bayes classification	0/2

# AI Courses & Guides

- **Generative AI in Higher Education**
- By Kings College London

<https://www.futurelearn.com/courses/generative-ai-in-higher-education>



## Activity 4: AI in teaching and learning

In this activity, you will explore how generative AI is being used to enrich teaching and learning. You will learn how to apply the PAIR framework for using AI in education, and discuss whether AI could ever replace teachers.



## Activity 5: Understanding AI in assessment and evaluation

This activity addresses the implications of AI for assessment and feedback in higher education. You will learn about the importance of critical AI literacy, and discuss the challenges of detecting GenAI outputs.



## Activity 6: AI and its impact on employment and society

This activity looks more broadly at how AI is creating new job roles and changing existing ones. You will reflect on how inclusive careers education and





# AI Courses & Guides

The screenshot shows the 'mini-course GENERATOR' interface. At the top, it says 'AI Assistant for Course Creation' with '19 credits left' and 'Renewed date 06/21/2023'. The first step is 'Describe your mini-course idea.' The second step is 'Select the title.', showing a list of five options, each with a blue checkmark icon: 'Exploring the Ethical Implications of Digital Technologies in Higher Education', 'Understanding Digital Ethics in the University Context', 'Navigating Ethical Challenges in the Digital Age', 'Applying Ethical Principles to Digital Technology in Higher Education', and 'Developing an Ethical Framework for Digital Practices in Higher Education'. Below this is a 'Write Your Own Title Instead' section with a 'Generate Outline' button. The third step is 'Conclude the outline.' A 'Get in touch' button is visible in the bottom right corner.

This screenshot shows a preview of the course 'Understanding Digital Ethics in the University Context'. It features four 'Info Card' thumbnails. The first card has a video thumbnail with the text 'CAN YOU PROVE IT?'. The second card is titled 'Introduction' and 'Definition of Digital Ethics', with text stating: 'Digital ethics is a branch of applied ethics which focuses on the ethical issues arising from the use of digital technology. It examines the moral and social implications of the use of digital technology in all areas of life, including in the workplace, at home and in the...'. The third card is titled 'Overview of University Context' and discusses the evolution of technology and its impact on education. The fourth card is titled 'Types of Digital Ethics in University Context' and discusses 'Appropriate Use of Digital Me Technology'. A 'Get in touch' button is at the bottom right.

## Understanding Digital Ethics

### Understanding Digital Ethics in the University Context



#### Introduction Definition of Digital Ethics

Digital ethics is a branch of applied ethics which focuses on the ethical issues arising from the use of digital technology. It examines the moral and social implications of the use of digital technology in all areas of life, including in the workplace, at home and in the public sphere. It examines the moral and social implications of the use of digital technology for the individual, society and the environment. Digital ethics considers the impact of digital technology on our lives, and how it can shape and impact our values, beliefs and behavior. It asks questions about the ethical implications of digital technology, and explores the moral, legal and social issues surrounding the use of digital technology.



# AI Courses & Guides

- <https://www.udemy.com/course/chatgpt-masterclass-a-complete-chatgpt-guide-for-beginners>

Business > E-Commerce > ChatGPT

## ChatGPT Masterclass: A Complete ChatGPT Guide for Beginners!

ChatGPT for Beginners to Experts: A Marketing Agencies' Guide on Starting or Scaling a Business Using ChatGPT & OpenAI!

**Bestseller** 4.5 ★★★★★ (5,594 ratings) 40,440 students

Created by [Lance Junck](#)

⚙️ Last updated 05/2023 🌐 English 🗨️ English [Auto], Japanese [Auto], [4 more](#)

# AI Courses & Guides

- “Rather than restricting the use of ChatGPT in education, bodies such as the Department for Education could hold the people who provide these services to account so that the potential for harmful use is minimised.”
- <https://www.cam.ac.uk/stories/ChatGPT-and-education>



# AI Courses & Guides

- **Top 7 ChatGPT Education Use Cases**
- <https://research.aimultiple.com/chatgpt-education/>

CE Please create a quiz for a high school class on cellular biology.



Quiz: High School Cellular Biology




1. Which of the following statements is NOT part of the cell theory?
  - a) All living organisms are composed of cells.
  - b) Cells are the basic unit of life.
  - c) All cells come from pre-existing cells.
  - d) All cells contain a nucleus.
2. What is the primary difference between prokaryotic and eukaryotic cells?
  - a) The presence or absence of a cell membrane
  - b) The presence or absence of a nucleus
  - c) The presence or absence of ribosomes
  - d) The presence or absence of mitochondria
3. Which cellular organelle is responsible for the synthesis of proteins?
  - a) Endoplasmic reticulum
  - b) Golgi apparatus
  - c) Ribosome
  - d) Mitochondria
4. What is the primary function of the cell membrane?
  - a) To produce energy for the cell
  - b) To regulate the passage of substances in and out of the cell
  - c) To synthesize proteins
  - d) To store genetic material
5. Which process is used by cell  to form of ATP?

# AI Courses & Guides

- Northern Illinois University

- <https://www.niu.edu/citl/resources/guides/chatgpt-and-education.shtml>

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## ChatGPT and Education

NOTE: This resource is a work in progress and will continue to be updated as new ChatGPT resources, research and ideas are published.

### Table of Contents

- [What is ChatGPT?](#)
- [What can ChatGPT do?](#)
- [What can ChatGPT NOT do? \(yet\)](#)
- [What can faculty do?](#)
- [What else do you need to know about ChatGPT?](#)
  - [Privacy](#)
  - [Trustworthiness](#)
  - [ChatGPT makes stuff up!](#)
  - [Free labor](#)
- [Additional Resources](#) **UPDATED**
- [Frequently Asked Questions](#)

## Educators and AI – take aways

**People want to understand AI - support this!**

Small, easily accessible courses, conferences and events

Familiarize yourself with the basics

Update syllabus for the generative AI

Be mindful of the tool's limitations and use it in combination with other resources

Organize open-books exams

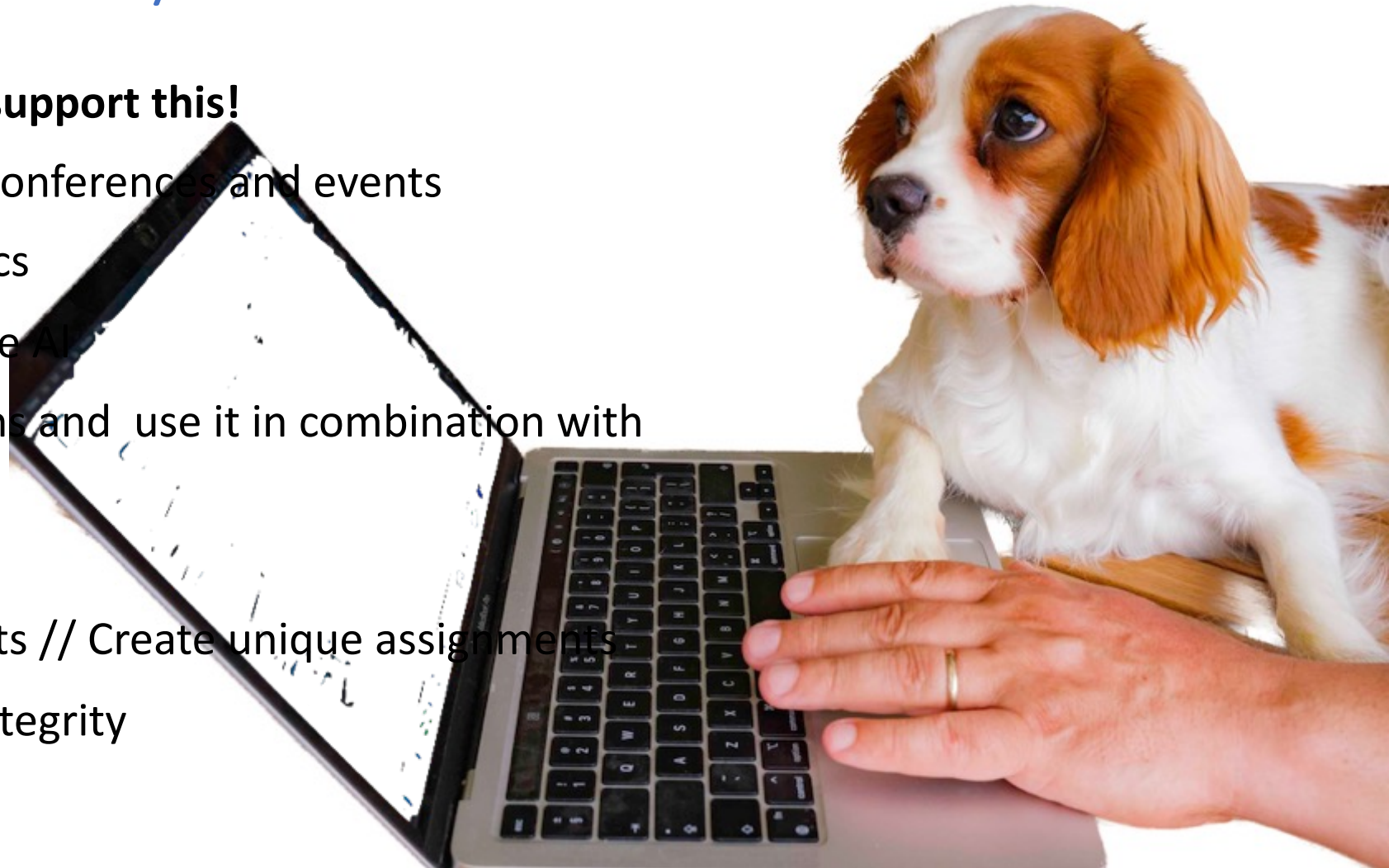
Get Rid of Disposable Assignments // Create unique assignments

Promote a culture of academic integrity


Learn

Share with others

Teach







# Co-create to control and benefit from Generative AI in Education

Regulation

Adopt

Use cases

Learn

Teach






# Welding

A complicated process, with rules  
Used by people with training  
Create simple industrial things  
Create wonderful things  
Create art



A close-up photograph of a person's hand typing on a silver laptop keyboard. The laptop is on a wooden table. A dog with white and brown fur and long, floppy ears is sitting on the table next to the laptop, looking towards the left. The laptop screen is open and shows a white page with some faint, illegible text. The background shows a wooden chair and a table.

Will I ever be able  
to communicate  
with my dog?

# Contact

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EDEN Fellow 2011, Senior Fellow 2021  
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