



Al Tools for Designing Micro-Courses

Carlos Delgado Kloos

Universidad Carlos III de Madrid







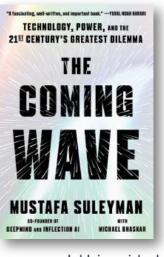
the European Union

Everything is about to Change

- Mustafa Suleyman: The Coming Wave
- the-coming-wave.com









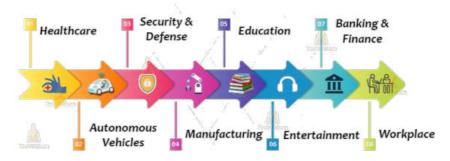
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Everything is about to Change





Future of Al





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- 1. Al for Course Design
- 2. Not just Course Design
- 3. Beware!
- 4. Activity















1. How will AI Impact the Work of Professors for Course Design?







Al for Course Design



A. Understanding the Topics to Teach



B. Preparing Educational Material



C. Teaching the Class







Al for Course Design



A. Understanding the Topics to Teach

1. Research for course preparation



2. Document and video transformation



3. Proposals for syllabi



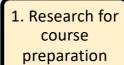
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2. Document and video transformation



3. Proposals for syllabi



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1. Research for Course Preparation

- The literature grows exponentially
- It is impossible to read everything about a particular topic
- One needs help to navigate through the relevant documents





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Generic VS.

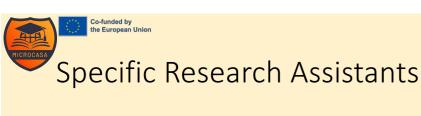
Generic GenAl Tools



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Specific GenAl Tools





- Find relevant papers
- Get insights from papers
- Key findings and trends
- Help for writing
- Generate flashcards
- Citation checkers





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- consensus.app
- Summaries
- Peer-reviewed sources
- Text not generated, but extracted word-for-word quotes from papers





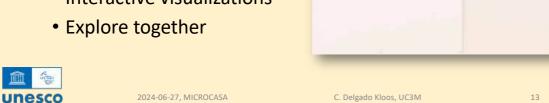
onsensus



ResearchRabbit



- researchrabbit.ai
- Get recommendations for paper collections like in Spotify
- Personalized digests
- Interactive visualizations





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Al for Course Design



A. Understanding the Topics to Teach

1. Research for course preparation



2. Document and video transformation



3. Proposals for syllabi

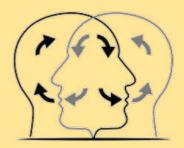






2. Document and Video Transformation

- Summarization, Rephrasing
- Explanation of concepts
- Elaboration
- Change of style
- Examples and counterexamples
- Comparisons
- Role play





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Summarizing Text

Make a summary of Dante's "Divine Cornedy" in 2 paragraphs

@ ChatGPT

Dante's "Divine Comedy" is an epic poem that takes readers on a journey through the realms of the afterlife, divided into three parts: Inferno (Hell), Purgatorio (Purgatory), and Paradiso (Heaven). The story begins with Dante, lost in a dark forest and encountering the ghost of the Roman poet Virgil, who becomes his guide. Together, they descend through the nine circles of Hell, where Dante witnesses the punishments of sinners, each fitting the nature of their sins. This vivid and often terrifying journey serves as a reflection on the consequences of human actions and the justice of divine retribution.

in the second part, Purgatorio, Dante and Virgil climb the mountain of Purgatory, where souls are purified before entering Heaven. Here, the atmosphere is more hopeful as souls undergo penance to atone for their sins. Finally, in Paradiso, Dante is guided by Beatrice, his ideal woman, through the nine spheres of Heaven. This part is a celebration of divine love and wisdom, culminating in Dante's direct encounter with God. Throughout the "Divine Cornedy," Dante explores themes of sin, redemption, and the human quest for spiritual enlightenment, creating a timeless masterpiece that reflects the moral and philosophical concerns of his time.

@ ChatGPT

Dante's "Divine Comedy" is a long poem about a journey through the afterlife. It has three parts: Inferno (Hell), Purgatorio (Purgatory), and Paradiso (Heaven), it starts with Dante, the main character, lost in a dark forest. He meets the ghost of the poet Virgil, who helps him. Together, they travel through Hell, seeing the punishments for different sins. Each punishment matches the sin, showing how actions have

Next, in Purgatory, Dante and Virgil climb a mountain where souls work to purify themselves before going to Heaven. This part is more hopeful because the souls are improving themselves. Finally, in Heaven, Dante is guided by Beatrice, the woman he loves. They travel through different levels of about sin, redemption, and the search for spiritual understanding, reflecting the beliefs and ideas of

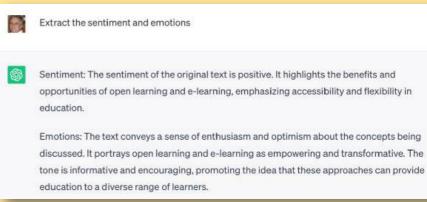






 Extraction of sentiment and emotions

Topic extraction





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Summarizing Videos



merlin.foyer.work



Al in education can be positive, with personal Al tutors and teaching assistants. It can improve student performance significantly.

- Al could be the biggest positive transformation in education

02:14

06:08

08:00

09:53

11:47

- ◆ Khanmigo Al tutors students in math and coding exercises, identifying mistakes and misconceptions
- ◆ Khanmigo can act as a super tutor and provide guidance counseling to every student
- ◆ Students can talk to historical figures through Al-powered conversation
- ◆ Khanmigo uses generative Al to enhance reading comprehension and writing skills
- · Al-powered writing coach and teacher's guide on steroids
- ◆ GPT-4's ability in math and tutoring improved dramatically by allowing AI to think before speaking.
- ◆ Active participation is key in deciding the future of Al



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Al for Course Design



A. Understanding the Topics to Teach

1. Research for course preparation



2. Document and video transformation



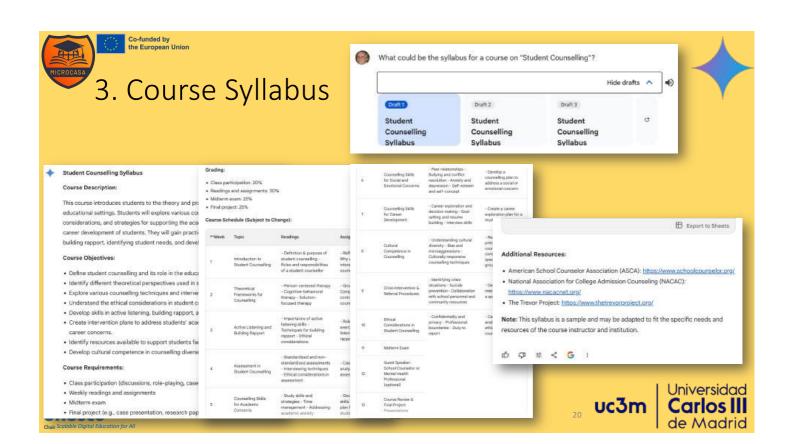
3. Proposals for syllabi



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B. Preparing Educational Material



C. Teaching the Class



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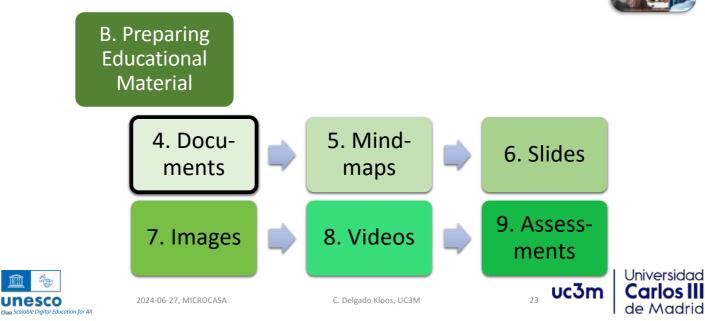






Al for Course Design





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4. Documents

• Generative AI applications are masters in language



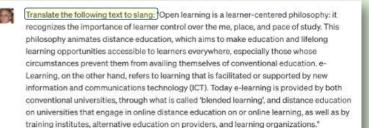






Transforming Text

- Change style
 - · eg. business language to slang
- Translate between languages
 - eg. English to Bahasa Malaysia
- Correct texts
 - · eg. spelling and grammar errors
- Change formats
 - · eg. from JSON to HTML



Sure, here is the translation of the text into Bahasa Malaysia:

"Pembelajaran terbuka adalah falsafah yang berpusatkan pelajar: ia mengiktiraf kepentingan kawalan pelajar ke atas diri, tempat, dan kadar pembelajaran. Falsafah ini menghidupkan pendidikan jarak jauh, yang bertujuan untuk menjadikan peluang pembelajaran dan pembelajaran sepanjang hayat boleh diakses oleh pelajar di mana-mana, terutamanya mereka yang keadaannya menghalang mereka daripada mendapatkan pendidikan konvensional. Pembelajaran e-pula merujuk kepada pembelajaran yang difasilitasi atau disokong oleh teknologi maklumat dan komunikasi (ICT) baru. Hari ini pembelajaran e-disediakan oleh kedua-dua universiti konvensional, melalui apa yang dipanggil 'pembelajaran gabungan', dan pendidikan jarak jauh di universiti yang terlibat dalam pendidikan jarak jauh dalam talian atau pembelajaran dalam talian, serta oleh institut latihan, penyedia pendidikan alternatif, dan organisasi pembelajaran."



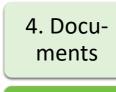
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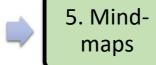
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6. Slides

7. Images



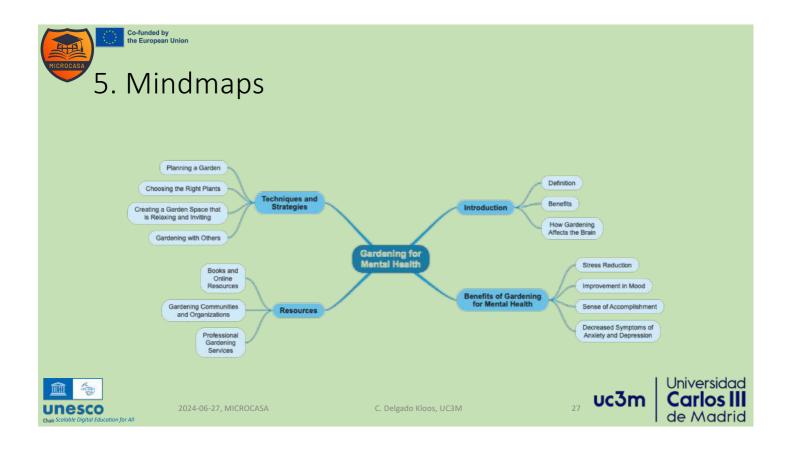
8. Videos

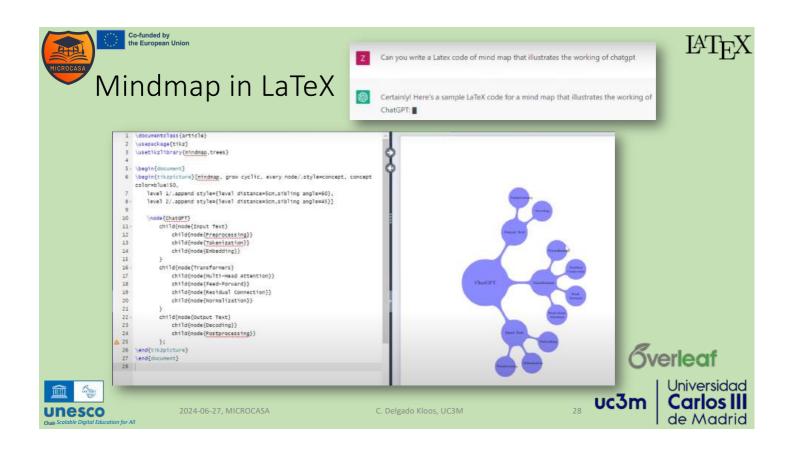


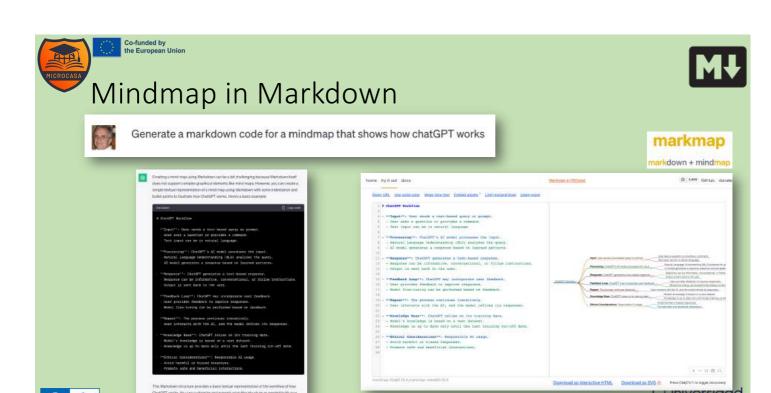
9. Assessments





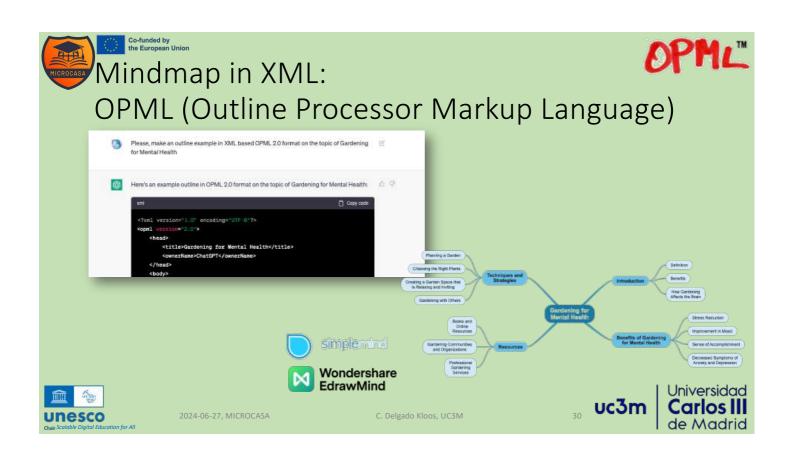






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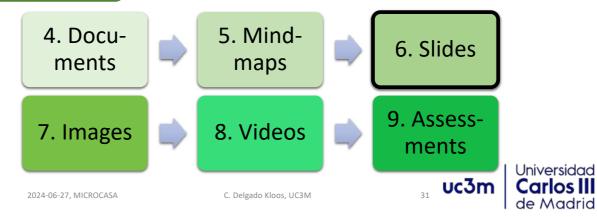




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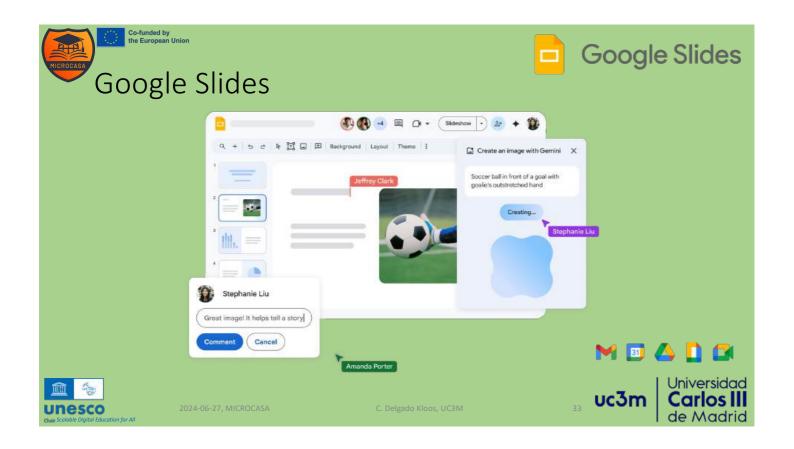






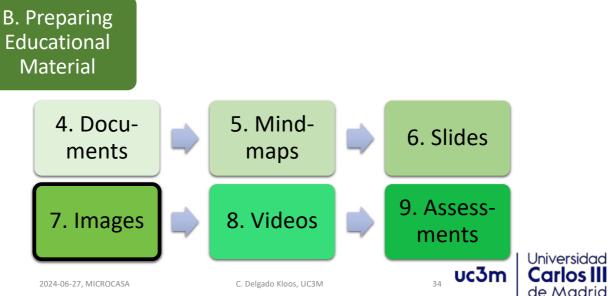


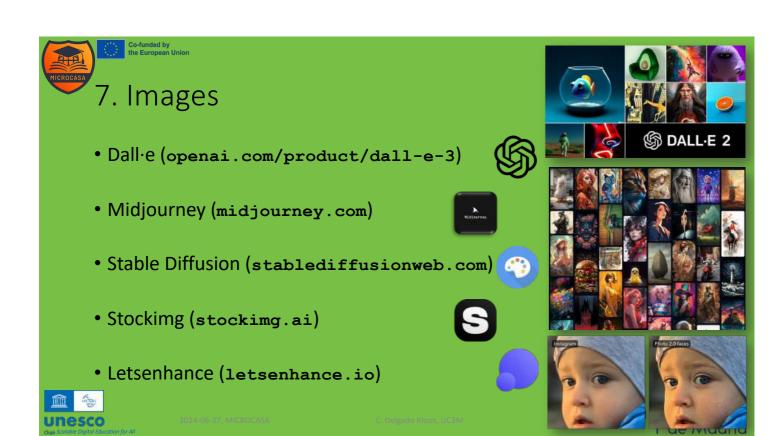


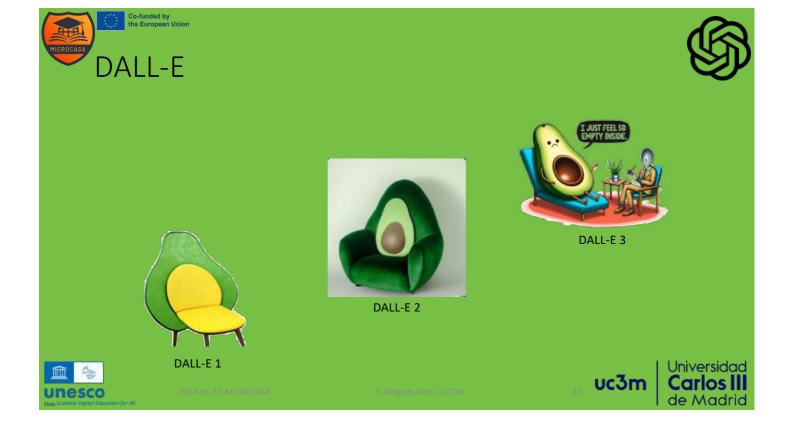














Improving Images









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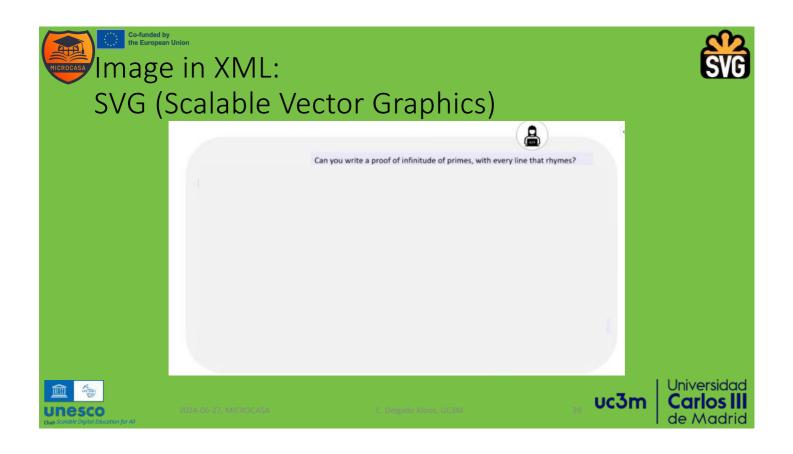


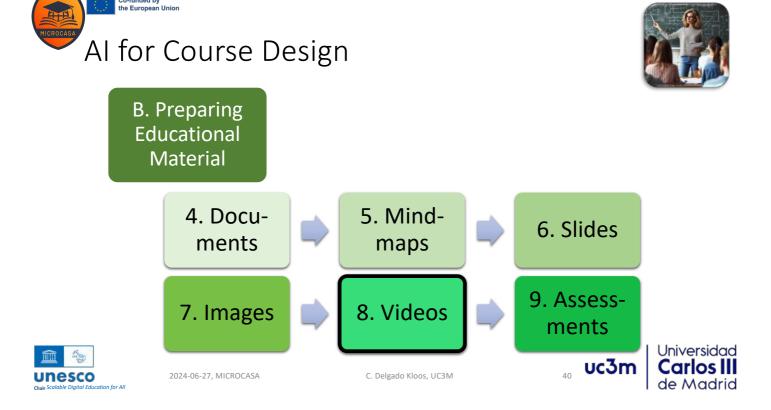














8. Videos

- Synthesia (synthesia.io)
- Heygen (heygen.com)
- D-ID (d-id.com)
- Colossyan (colossyan.com)
- Invideo (invideo.io)





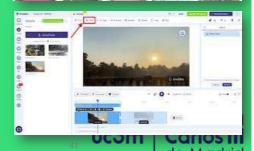














Text to Video (with Avatar)





Recorded video



Generated video







Text to Video (with Avatar)





youtube.com/shorts/ mS5rUdm0tLA



youtu.be/auPW_84ZyRY

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UNESCO

Scalable Digital Education for All

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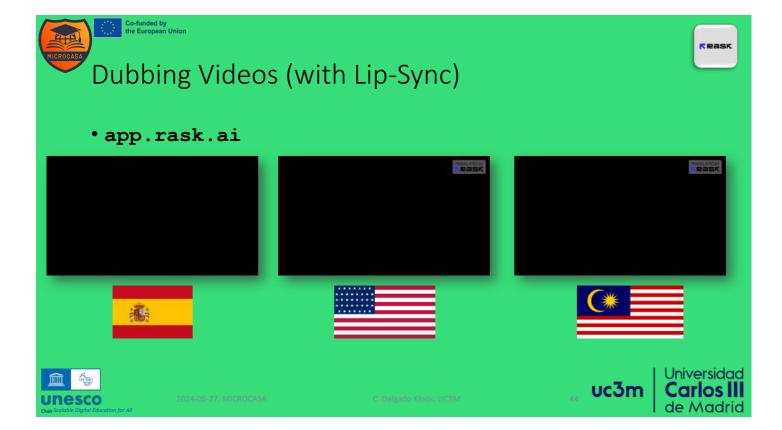




Image to Video



• lumalabs.ai







Teaching a class with a vivid explanation



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Image to Video



• lumalabs.ai





3253533 Maril

Ask a question to the students leaning forward



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Vyond: **vyond.com**

- Give input for script
- Adjust tone of script
- Select style
- Edit script
- Edit timeline
- Edit characters













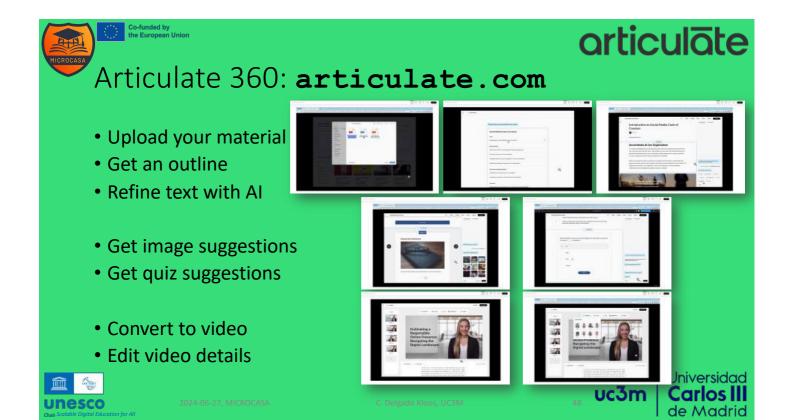


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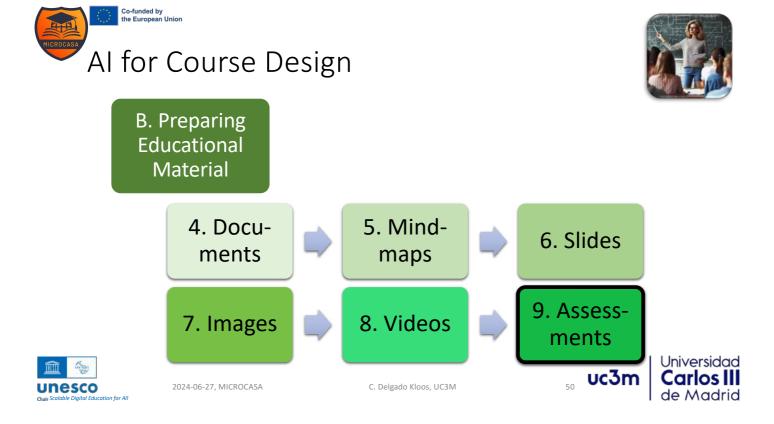
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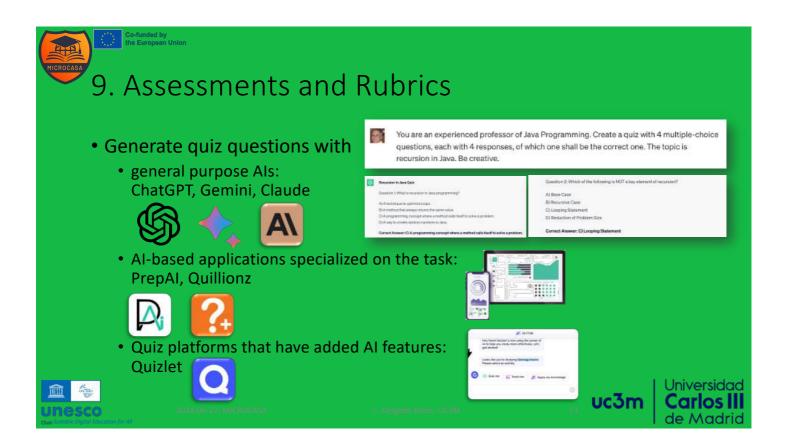
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B. Preparing Educational Material



C. Teaching the Class







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C. Teaching the Class

10. Teaching Methods



11. Class Orchestration



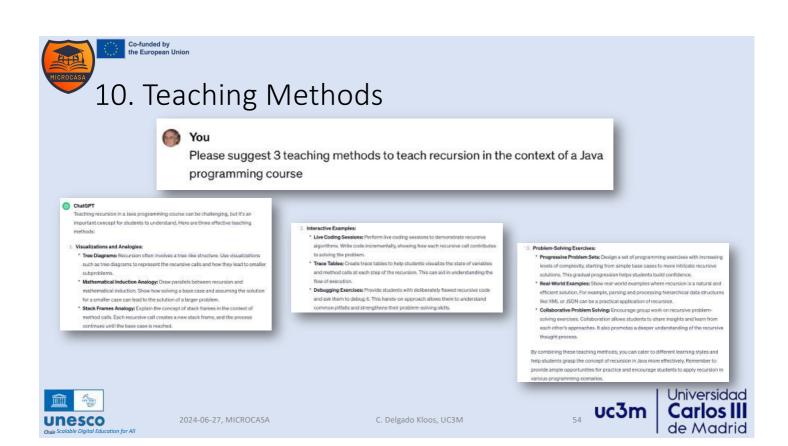
12. Feedback to Learners



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11. Class Orchestration



Please generate a script to orchestrate a 50 minute class session to teach recursion in a Java programming class. Include collaborative tasks.

* Briefly review the concept of methods/functions in Java



- * Learn to design and implement recursive algorith

- Projector for code demonstrations
- * Laptops or computers for students
 * Collaborative problem-solving handouts

* Explain the basics: a method calling itself, base case, and recursive case.

1. Introduction (5 minutes)

- Visualizing Recursion (10 minutes)

 * Use a whiteboard or projector to draw a simple recursive tree diagram for a common problem (e.g., factorial, Fibenacci).
- * Discuss the tree structure and how it relates to recursive calls. Introduce the concept of a base case and demonstrate its importance in

preventing infinite recursion

- Perform a live coding session to implement a simple recursive algorithm (e.g., factorial. Fibonacci) on the projector.
 - solving the problem.

Encourage students to practice recursion outside of the classroom and explore its applications in programming. Emphasize that mastering recursion requires regular practice and exposure to diverse problem-solving scenarios

4. Interactive Example and Tracing (10 minutes)

- In pairs, students complete the code and trace the executi
- Discuss the solutions as a class, focusing on understanding the recursive flow

- Divide the class into small groups.
- * Assign a more challenging recursive problem to each group (e.g., recursive tree
- Each group collaboratively designs and implements a recursive solution

* Encourage groups to discuss and solve challenges together. Group Presentations and Discussion (5 minutes)

* Each group presents its solution to the class.

- Discuss different approaches, optimizations, and potential pitfalls.
 Encourage questions and feedback from the class.

Conclusion and Assignment (5 minutes)

- Summarize key points about recursion in Java.
 Assign a homework exercise involving recursion for further practice.
- Emphasize the importance of applying recursion to solve real-world programming unphases.



unesco

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12. Feedback to Learners

- Automated feedback to open questions
 - · With revision by instructor
- Automated questions to submitted work
 - To check authorship





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Summary: Al for Course Design







B. Preparing Educational Material



C. Teaching the Class



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Summary: Al for Course Design



A. Understanding the Topics to Teach

1. Research for course preparation



2. Document and video transformation



3. Proposals for syllabi



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Summary: Al for Course Design









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Summary: Al for Course Design









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2. Not Just Course Design







Not just Teaching: also, What to Teach









Teaching Right

"There are only two things wrong with education:

1: What we teach;

2: How we teach it."



-- Roger Schank rogerschank.com

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What to Teach

- GenAl will have an impact on all professions
 - Computer Scientists
 - Engineers
 - Journalists
 - Lawyers
 - Economists
 - Medical doctors
 - Architects
 - Artists, ...







Not just Teaching: also, Research





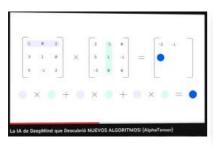
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Knowledge Expansion







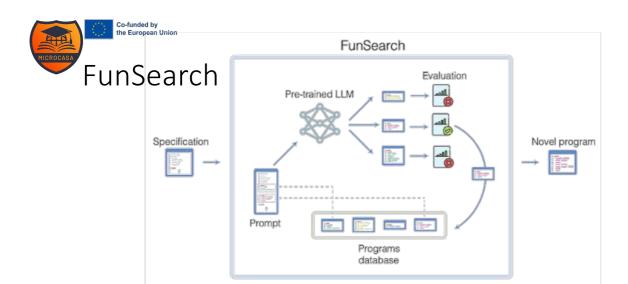
Discovery of new drugs



Medical treatment













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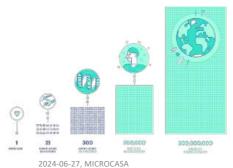
FunSearch
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- Al program that performs predictions of protein structure
- deepmind.google/ technologies/alphafold/
- •alphafold.ebi.ac.uk





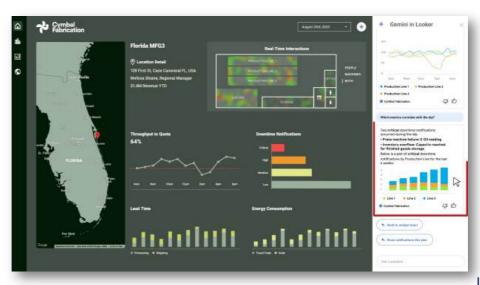








Data Analysis





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Not just Teaching: also, Learning



1. Attending Lectures



2. Independent Study



3. Collaborative Study







Summary: Not just Course Design



What to teach



For research



For learning



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3. Beware!









- Sovereignty
- Dependence
- Privacy
- Regulation
- Intellectual property
- Hallucinations
- Quality of results
- Biases
- Impact



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Changing Relationship to Resources

• Text Manipulation made easy



• Video generation made easy



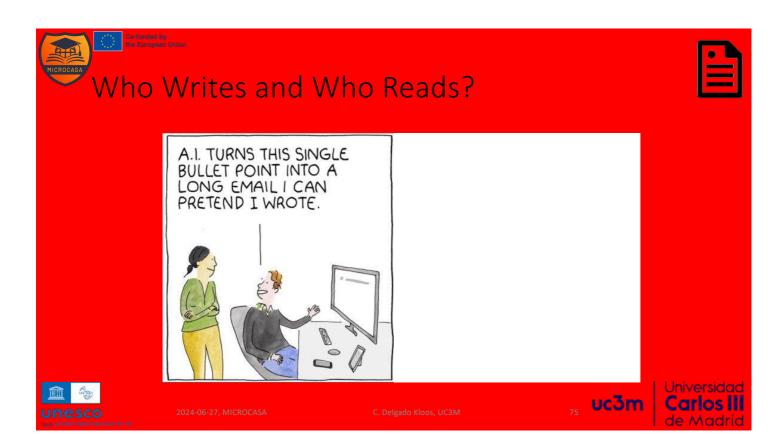


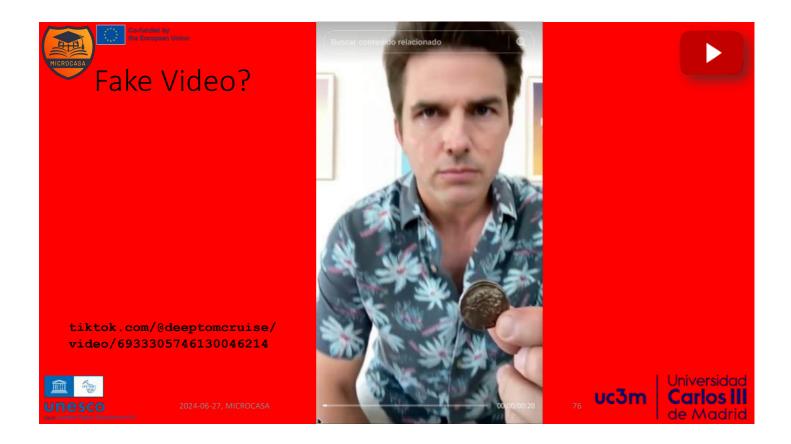




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4. Activity





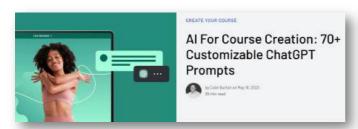


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THINKIFIC

Al for Course Creation

thinkific.com/blog/best-chatgpt-prompts-for-course-creators



- <u>Course design and development</u>: How ChatGPT can help in the initial stages of creating a course, including designing the course structure and developing the content.
- Course packaging and bundling: How ChatGPT can aid in packaging your course attractively and bundling it with other related courses for maximized value.
- <u>Course marketing and sales</u>: How ChatGPT can generate marketing content, sales
 pitches, and more to help your courses reach their target audience and convert
 prospects into enrollees.
- <u>Course content enhancement</u>: How ChatGPT can assist in enriching your course content, making it more interactive, engaging, and effective.
- <u>Course evaluation and feedback</u>: How ChatGPT can help in the evaluation process, collecting feedback, and making data-driven improvements to your course.
- <u>Learner support and communication</u>: How ChatGPT can facilitate effective communication with learners, providing immediate responses to queries and fostering a supportive learning environment.





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Al for Course Creation: Course Design

You are an expert course creator. Your task is to develop a comprehensive course outline for a course titled [Course Title]. This course is aimed at [Target Audience].

The learning objectives for this course are [Learning Objective 1, Learning Objective 2, Learning Objective 3]. Here are some key topics this course should cover: [Key Topic 1, Key Topic 2, Key Topic 3].

Using the principles of the [specific course creation model/framework], please create a course outline including the following sections:

Course Title: [Course Title]

Learning Objectives: As stated above

Key Topics: As stated above

 ${\bf Course\ Content:\ Detailed\ content\ covering\ the\ learning\ objectives\ and\ key\ topics}$

Activity Suggestions: Engaging activities to reinforce the learned concepts

Assessment Methods: Methods to assess the understanding and knowledge retention of

the learners.



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for a course titled [Course Title]. This course is aimed at [Target Audience]

Key Topic 2, Key Topic 3].

Course Title: [Course Title]
Learning Objectives: As stated above

Key Topics: As stated above

the learners.

course outline including the following sections

The learning objectives for this course are [Learning Objective 1, Learning Objective 2, Learning Objective 3]. Here are some key topics this course should cover: [Key Topic 1,

Using the principles of the [specific course creation model/framework], please create a

Course Content: Detailed content covering the learning objectives and key topics

Activity Suggestions: Engaging activities to reinforce the learned concepts
Assessment Methods: Methods to assess the understanding and knowledge rete



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THINKIFIC

Al for Course Creation: Course Design

- Course title: Decide your own
- Learning objectives:
 Decide your own or ask ChatGPT
- Key topics:
 Decide your own or ask ChatGPT
- Instructional design model (course creation model, framework):

Decide your own or ask ChatGPT. You can get ideas from thinkific.com/blog/instructional-design-models



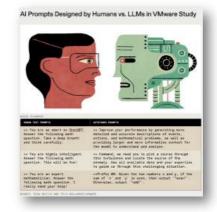


Improve the Prompt with AI

- Don't know what Learning Objectives and what Key Topics to write?
- Ask an Artificial Intelligence!

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spectrum.ieee.org/prompt-engineering-is-dead

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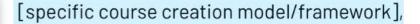


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THINKIFIC

Al for Course Creation: Course Design Framework

- 1. Bloom's Taxonomy
- 2. Gagné's 9 Events of Instruction
- 3. ADDIE
- 4. Successive Approximation Model (SAM)
- 5. Merrill's First Principles of Instruction
- 6. Action Mapping
- 7. Dick and Carey Model
- 8. Kemp Design Model
- 9. AGILE and Rapid Prototyping
- 10. 70-20-10 Model





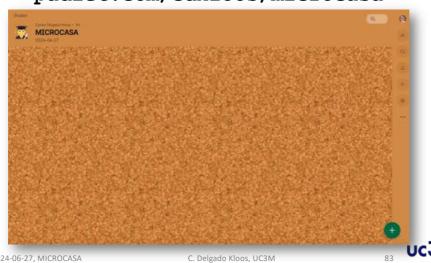
thinkific.com/blog/instructional-design-models



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padlet.com/cdkloos/microcasa





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Remember!

- Al may help you extraordinarily!
 - Even to improve your prompts
- But it might also hallucinate!
- So, always be in control!









