

An educational chatbot to promote Critical Thinking

Lucile Favero Montero

Supervisors: Nuria Oliver, Tanja Käser, Juan-Antonio Pérez-Ortiz



Increasing integration of AI tools in education presents both

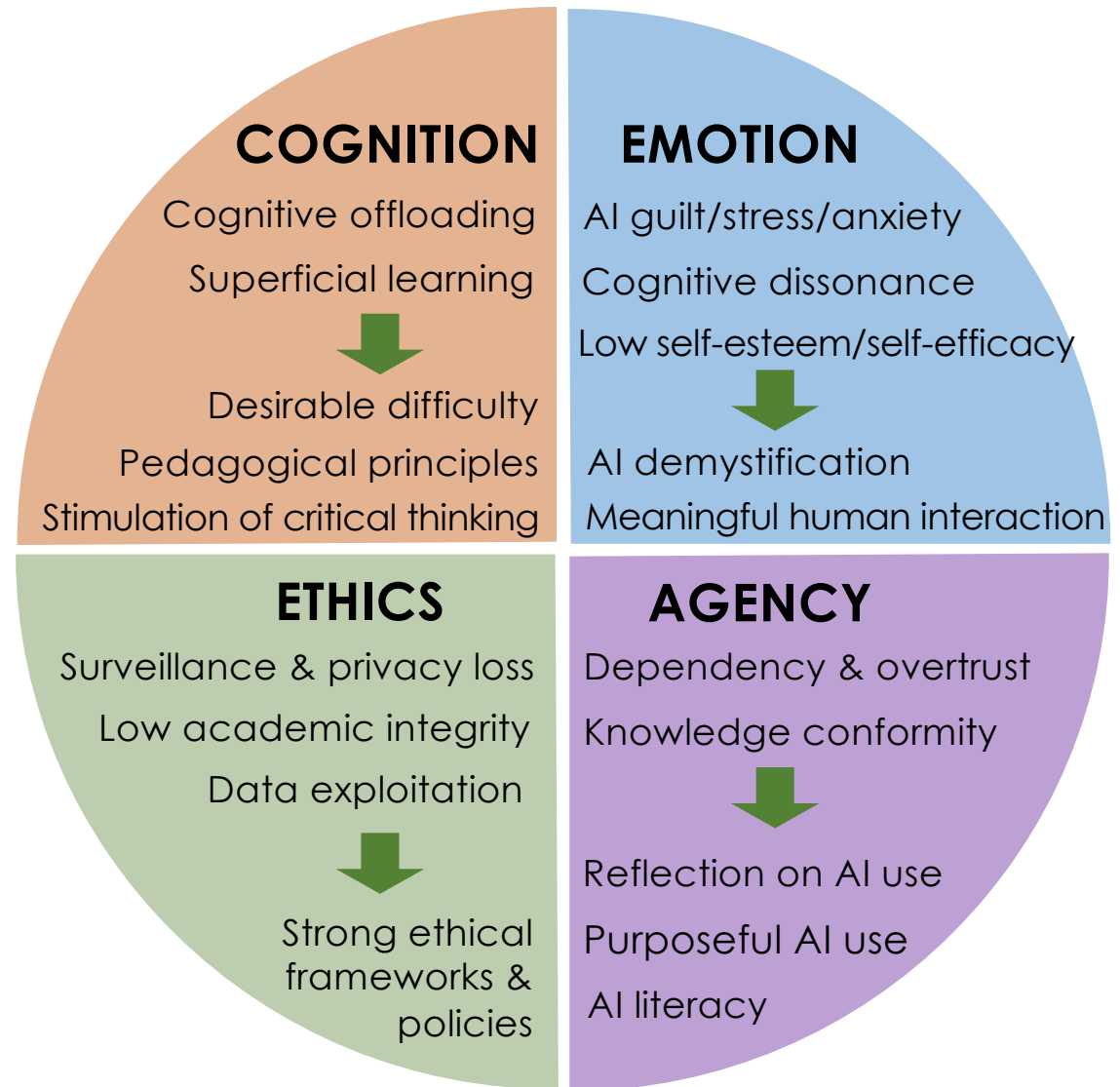
opportunities

&

challenges

- Mitigate **teacher shortages**
 - **Up-to-date** educational materials
 - **Self-paced** learning
 - **24/7** Instant feedback
-
- Risk of **overreliance**
 - 🗑️ **critical thinking**
 - 🗑️ student **agency**
 - Concerns about data **privacy**

Towards a Critical & Responsible Use of AI in Education



[1] Favero, Perez-Ortiz, Kaser, Oliver. [Do AI tutors empower or enslave learners? Toward a critical use of AI in education](#) GenAIHE workshop @ AIED2025



Rather than allowing chatbots to **weaken our cognitive abilities**, my objective is to develop a chatbot that **supports the enhancement of critical thinking and self-regulation skills**



A Socratic approach to an educational chatbot



Traditional chatbot

Provides the knowledge to facilitate the learning



Socratic chatbot

Asks specific and targeted questions to help the learners build knowledge by themselves

Socratic questioning

What is Socratic questioning?

Socratic questioning is a **disciplined questioning** method used to **encourage critical thinking**, uncover underlying beliefs, and explore complex ideas

Socratic questioning

Taxonomy of Socratic questions based on Critical Thinking concepts¹

	Question type	Description	Exemplar
01	Clarification	Question probing the ambiguities of a thought	What do you mean by ... ?
02	Probing assumption	Question probing the assumptions behind a thought	Why do you assume ... ?
03	Probing reasons and evidences	Question probing the justifications or concrete evidences that could have supported a thought	How did you know that ... ?
04	Probing implications and consequences	Question probing the impacts or implications of a thought	If ... , what is likely to happen as a result?
05	Probing alternative viewpoints and perspectives	Question probing other possible viewpoints	What else should we consider about ...?

1. R. Paul, L. Elder, *The Thinker's Guide to Socratic Questioning*, Rowman & Littlefield, 2019.

A Socratic approach to an educational chatbot

Aims

- Reflexion
- Purposeful learning
- Critical thinking

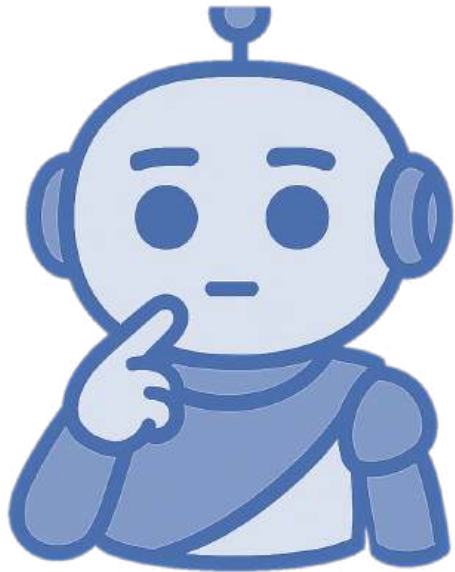
Educational Tasks

- Question answering
- Self-regulation
- Knowledge discovery

Broader applications

- Combatting fake news
- Promoting democracy

**Focus on helping students
improve their essays**



Maike

The educational
chatbot to promote
critical thinking

Maike

1. The student writes their text.

Hi Lucile, ready to write?

Please enter your essay details

Should Students Be Taught to Compete or to Cooperate?

Students should be taught to cooperate rather than compete. Cooperation builds teamwork skills that are essential in real life, like communication and problem-solving. In contrast, competition can create stress and lead to jealousy among classmates. When students work together, they learn to value different perspectives and help each other grow. For example, group projects teach responsibility and encourage shared success. Some argue that competition pushes students to do their best. While this may be true, it can also make students feel like failures if they don't "win." Cooperation, on the other hand, creates a supportive environment where everyone can succeed.

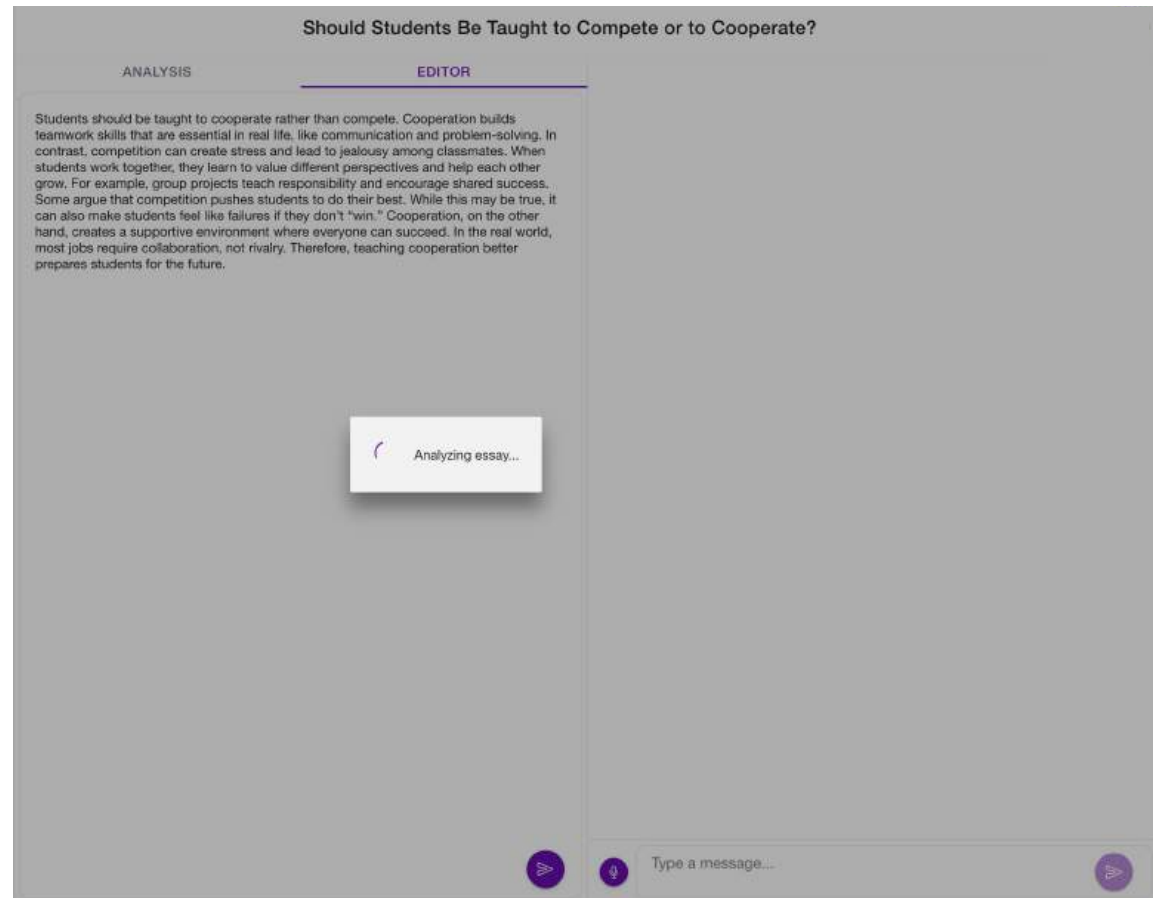


Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

2. Maike analyzes the text.



Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

2. Maike analyzes the text.

Should Students Be Taught to Compete or to Cooperate?

ANALYSIS

EDITOR

S

Students should be taught to cooperate rather than compete

S

Cooperation builds teamwork skills that are essential in real life, like communication and problem-solving

W

In contrast, competition can create stress and lead to jealousy among classmates

S

When students work together, they learn to value different perspectives and help each other grow

S

For example, group projects teach responsibility and encourage shared success

W

Some argue that competition pushes students to do their best

W

While this may be true, it can also make students feel like failures if they don't "win."

S

Cooperation, on the other hand, creates a supportive environment where everyone can succeed

S

In the real world, most jobs require collaboration, not rivalry

S

Therefore, teaching cooperation better prepares students for the future

You make some compelling points about the benefits of cooperation, but I notice that you only briefly mention potential drawbacks and how they can be addressed. Let's take a closer look at the rebuttal- How does the rebuttal adequately address potential drawbacks of cooperative learning, such as unequal distribution of workload or lack of individual accountability? What do you think?

Type:

Claim

Premise

Rebuttal

Quality:

Weak

Strong

Type a message...

Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

2. Maike analyzes the text.

- Detection of argument components

Claim Premise Rebuttal

- Quality assessment of each component

Weak Strong



Should Students Be Taught to

ANALYSIS

EDITOR

S Students should be taught to cooperate rather than compete S Cooperation builds teamwork skills that are essential in real life, like communication and problem-solving W In contrast, competition can create stress and lead to jealousy among classmates S When students work together, they learn to value different perspectives and help each other grow S For example, group projects teach responsibility and encourage shared success W Some argue that competition pushes students to do their best W While this may be true, it can also make students feel like failures if they don't "win." S Cooperation, on the other hand, creates a supportive environment where everyone can succeed S In the real world, most jobs require collaboration, not rivalry S Therefore, teaching cooperation better prepares students for the future

Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

2. Maike analyzes the text.

Should Students Be Taught to Compete or to Cooperate?

ANALYSIS

EDITOR

S

Students should be taught to cooperate rather than compete

S

Cooperation builds teamwork skills that are essential in real life, like communication and problem-solving

W

In contrast, competition can create stress and lead to jealousy among classmates

S

When students work together, they learn to value different perspectives and help each other grow

S

For example, group projects teach responsibility and encourage shared success

W

Some argue that competition pushes students to do their best

W

While this may be true, it can also make students feel like failures if they don't "win."

S

Cooperation, on the other hand, creates a supportive environment where everyone can succeed

S

In the real world, most jobs require collaboration, not rivalry

S

Therefore, teaching cooperation better prepares students for the future

You make some compelling points about the benefits of cooperation, but I notice that you only briefly mention potential drawbacks and how they can be addressed. Let's take a closer look at the rebuttal- How does the rebuttal adequately address potential drawbacks of cooperative learning, such as unequal distribution of workload or lack of individual accountability? What do you think?

Type:

Claim

Premise

Rebuttal

Quality:

W Weak

S Strong

Type a message...

Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

2. Maike analyzes the text.

3. Maike formulates a Socratic question about the weakest parts of the text.

You make some compelling points about the benefits of cooperation, but I notice that you only briefly mention potential drawbacks and how they can be addressed. **Let's take a closer look at the rebuttal-** How does the rebuttal adequately address potential drawbacks of cooperative learning, such as unequal distribution of workload or lack of individual accountability? What do you think?

Maike

1. The student writes their text.

2. Maike analyzes the text.

3. Maike formulates a Socratic question about the weakest parts of the text.

4. The student and Maike converse...

Should Students Be Taught to Compete or to Cooperate?

ANALYSIS

EDITOR

S Students should be taught to cooperate rather than compete S Cooperation builds teamwork skills that are essential in real life, like communication and problem-solving W In contrast, competition can create stress and lead to jealousy among classmates S When students work together, they learn to value different perspectives and help each other grow S For example, group projects teach responsibility and encourage shared success W Some argue that competition pushes students to do their best W While this may be true, it can also make students feel like failures if they don't "win." S Cooperation, on the other hand, creates a supportive environment where everyone can succeed S In the real world, most jobs require collaboration, not rivalry S Therefore, teaching cooperation better prepares students for the future

You make some compelling points about the benefits of cooperation, but I notice that you only briefly mention potential drawbacks and how they can be addressed. Let's take a closer look at the rebuttal- How does the rebuttal adequately address potential drawbacks of cooperative learning, such as unequal distribution of workload or lack of individual accountability? What do you think?

I think cooperative learning can face issues like unequal effort, but these can be managed with clear roles, peer evaluation, and teacher monitoring. That way, students stay accountable while still benefiting from teamwork.

Let's dive deeper into your response about how to manage unequal distribution of workload and lack of individual accountability in cooperative learning. You mentioned clear roles, peer evaluation, and teacher monitoring as solutions. How do you envision these mechanisms would work in practice? What kind of specific strategies or protocols could be put in place to ensure that all students are contributing equally and feeling accountable for their own work? This question aims to help the student think more concretely about the implementation details of their suggested solutions, rather than just stating them as general ideas. By encouraging the student to elaborate on these points, we can gain a better understanding of how their argument holds up against potential counterarguments.

Clear roles could mean assigning each student a specific task, like researcher, writer, or presenter, so everyone has a responsibility. Peer evaluation could involve short reflections where students rate both their own and their teammates' contributions.

Let's continue exploring how you envision implementing cooperative learning in practice. Your mention of assigning clear roles and peer evaluation is a good start, but I'd like to press further. For instance, how would these mechanisms be communicated to students at the beginning of the project? Would it be through a detailed handout, a classroom discussion, or some other means? How do you think this initial communication can impact the effectiveness of cooperative learning?

Type: Claim Premise Rebuttal Quality: Weak Strong

Type a message...

Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

2. Maïke analyzes the text.

3. Maïke formulates a Socratic question about the weakest parts of the text.

4. The student and Maïke converse...

5. The student revises their text.

The screenshot displays the Maïke AI interface. At the top, the title "Should Students Be Taught to Compete or to Cooperate?" is shown. Below it, a text editor window contains a student's essay. The essay is divided into two sections: "ANALYSIS" and "EDITOR". The "ANALYSIS" section contains a paragraph of text with several highlighted segments. The "EDITOR" section contains a paragraph of text with several highlighted segments. The interface includes a chat window on the right with a message from Maïke: "You make some compelling points about the benefits of cooperation, but I notice that you only briefly mention potential drawbacks and how they can be addressed. Let's take a closer look at the rebuttal- How does the rebuttal adequately address potential drawbacks of cooperative learning, such as unequal distribution of workload or lack of individual accountability? What do you think?". Below this, a Socratic question is displayed: "Let's dive deeper into your response about how to manage unequal distribution of workload and lack of individual accountability in cooperative learning. You mentioned clear roles, peer evaluation, and teacher monitoring as solutions. How do you envision these mechanisms would work in practice? What kind of specific strategies or protocols could be put in place to ensure that all students are contributing equally and feeling accountable for their own work? This question aims to help the student think more concretely about the implementation details of their suggested solutions, rather than just stating them as general ideas. By encouraging the student to elaborate on these points, we can gain a better understanding of how their argument holds up against potential counterarguments." At the bottom, there is a chat input field with a placeholder "Type a message..." and a button to send the message.

Should Students Be Taught to Compete or to Cooperate?

ANALYSIS EDITOR

Students should be taught to cooperate rather than compete. Cooperation builds teamwork skills that are essential in real life, like communication and problem-solving. In contrast, competition can create stress and lead to jealousy among classmates. When students work together, they learn to value different perspectives and help each other grow. For example, group projects teach responsibility and encourage shared success. Some argue that competition pushes students to do their best. While this may be true, it can also make students feel like failures if they don't "win." Cooperation, on the other hand, creates a supportive environment where everyone can succeed. In the real world, most jobs require collaboration, not rivalry. Therefore, teaching cooperation better prepares students for the future.

You make some compelling points about the benefits of cooperation, but I notice that you only briefly mention potential drawbacks and how they can be addressed. Let's take a closer look at the rebuttal- How does the rebuttal adequately address potential drawbacks of cooperative learning, such as unequal distribution of workload or lack of individual accountability? What do you think?

I think cooperative learning can face issues like unequal effort, but these can be managed with clear roles, peer evaluation, and teacher monitoring. That way, students stay accountable while still benefiting from teamwork.

Let's dive deeper into your response about how to manage unequal distribution of workload and lack of individual accountability in cooperative learning. You mentioned clear roles, peer evaluation, and teacher monitoring as solutions. How do you envision these mechanisms would work in practice? What kind of specific strategies or protocols could be put in place to ensure that all students are contributing equally and feeling accountable for their own work? This question aims to help the student think more concretely about the implementation details of their suggested solutions, rather than just stating them as general ideas. By encouraging the student to elaborate on these points, we can gain a better understanding of how their argument holds up against potential counterarguments.

Clear roles could mean assigning each student a specific task, like researcher, writer, or presenter, so everyone has a responsibility. Peer evaluation could involve short reflections where students rate both their own and their teammates' contributions.

Let's continue exploring how you envision implementing cooperative learning in practice. Your mention of assigning clear roles and peer evaluation is a good start, but I'd like to press further. For instance, how would these mechanisms be communicated to students at the beginning of the project? Would it be through a detailed handout, a classroom discussion, or some other means? How do you think this initial communication can impact the effectiveness of cooperative learning?

Type a message...

Type: Claim Premise Rebuttal Quality: Weak Strong

Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

2. Maïke analyzes the text.

3. Maïke formulates a Socratic question about the weakest parts of the text.

4. The student and Maïke converse...

5. The student revises their text.

The screenshot displays the Maïke interface, which is designed for student writing and revision. At the top, the title "Should Students Be Taught to Compete or to Cooperate?" is visible. Below the title, there are two tabs: "ANALYSIS" and "EDITOR". The "ANALYSIS" tab is currently selected, and the text within it is highlighted with a red box. The text in the "ANALYSIS" tab reads: "Students should be taught to cooperate rather than compete. Cooperation builds teamwork skills that are essential in real life, like communication and problem-solving. In contrast, competition can create stress and lead to jealousy among classmates. When students work together, they learn to value different perspectives and help each other grow. For example, group projects teach responsibility and encourage shared success. Some argue that competition pushes students to do their best. While this may be true, it can also make students feel like failures if they don't 'win.' Cooperation, on the other hand, creates a supportive environment where everyone can succeed. In the real world, most jobs require collaboration, not rivalry. Therefore, teaching cooperation better prepares students for the future."

Below the text, there are three Socratic questions generated by Maïke, each in a light blue box:

- "You make some compelling points about the benefits of cooperation, but I notice that you only briefly mention potential drawbacks and how they can be addressed. Let's take a closer look at the rebuttal- How does the rebuttal adequately address potential drawbacks of cooperative learning, such as unequal distribution of workload or lack of individual accountability? What do you think?"
- "I think cooperative learning can face issues like unequal effort, but these can be managed with clear roles, peer evaluation, and teacher monitoring. That way, students stay accountable while still benefiting from teamwork."
- "Let's dive deeper into your response about how to manage unequal distribution of workload and lack of individual accountability in cooperative learning. You mentioned clear roles, peer evaluation, and teacher monitoring as solutions. How do you envision these mechanisms would work in practice? What kind of specific strategies or protocols could be put in place to ensure that all students are contributing equally and feeling accountable for their own work? This question aims to help the student think more concretely about the implementation details of their suggested solutions, rather than just stating them as general ideas. By encouraging the student to elaborate on these points, we can gain a better understanding of how their argument holds up against potential counterarguments."

At the bottom of the interface, there is a chat area with a text input field labeled "Type a message..." and three circular icons: a speech bubble, a plus sign, and a checkmark.

Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

2. Maïke analyzes the text.

3. Maïke formulates a Socratic question about the weakest parts of the text.

4. The student and Maïke converse...

5. The student revises their text.

The screenshot displays the Maïke AI interface, titled "Should Students Be Taught to Compete or to Cooperate?". The interface is divided into two main sections: "ANALYSIS" and "EDITOR". The "ANALYSIS" section contains a text box with a red border, highlighting a paragraph about cooperation and competition. The "EDITOR" section contains a text box with a green border, highlighting a paragraph about competition and cooperation. The interface also features a chat area on the right with several Socratic questions and a message input field at the bottom.

Should Students Be Taught to Compete or to Cooperate?

ANALYSIS EDITOR

Students should be taught to cooperate rather than compete. Cooperation builds teamwork skills that are essential in real life, like communication and problem-solving. In contrast, competition can create stress and lead to jealousy among classmates. When students work together, they learn to value different perspectives and help each other grow. For example, group projects teach responsibility and encourage shared success. Some argue that competition motivates students to push beyond their limits and strive for excellence, as it creates a sense of challenge and reward. While this may be true, it can also make students feel like failures if they don't "win." Cooperation, on the other hand, creates a supportive environment where everyone can succeed. In the real world, most jobs require collaboration, not rivalry. Therefore, teaching cooperation better prepares students for the future.

You make some compelling points about the benefits of cooperation, but I notice that you only briefly mention potential drawbacks and how they can be addressed. Let's take a closer look at the rebuttal- How does the rebuttal adequately address potential drawbacks of cooperative learning, such as unequal distribution of workload or lack of individual accountability? What do you think?

I think cooperative learning can face issues like unequal effort, but these can be managed with clear roles, peer evaluation, and teacher monitoring. That way, students stay accountable while still benefiting from teamwork.

Let's dive deeper into your response about how to manage unequal distribution of workload and lack of individual accountability in cooperative learning. You mentioned clear roles, peer evaluation, and teacher monitoring as solutions. How do you envision these mechanisms would work in practice? What kind of specific strategies or protocols could be put in place to ensure that all students are contributing equally and feeling accountable for their own work? This question aims to help the student think more concretely about the implementation details of their suggested solutions, rather than just stating them as general ideas. By encouraging the student to elaborate on these points, we can gain a better understanding of how their argument holds up against potential counterarguments.

Clear roles could mean assigning each student a specific task, like researcher, writer, or presenter, so everyone has a responsibility. Peer evaluation could involve short reflections where students rate both their own and their teammates' contributions.

Let's continue exploring how you envision implementing cooperative learning in practice. Your mention of assigning clear roles and peer evaluation is a good start, but I'd like to press further. For instance, how would these mechanisms be communicated to students at the beginning of the project? Would it be through a detailed handout, a classroom discussion, or some other means? How do you think this initial communication can impact the effectiveness of cooperative learning?

Type a message...

Frontend & UI: Marta Serrador

Maike

1. The student writes their text.

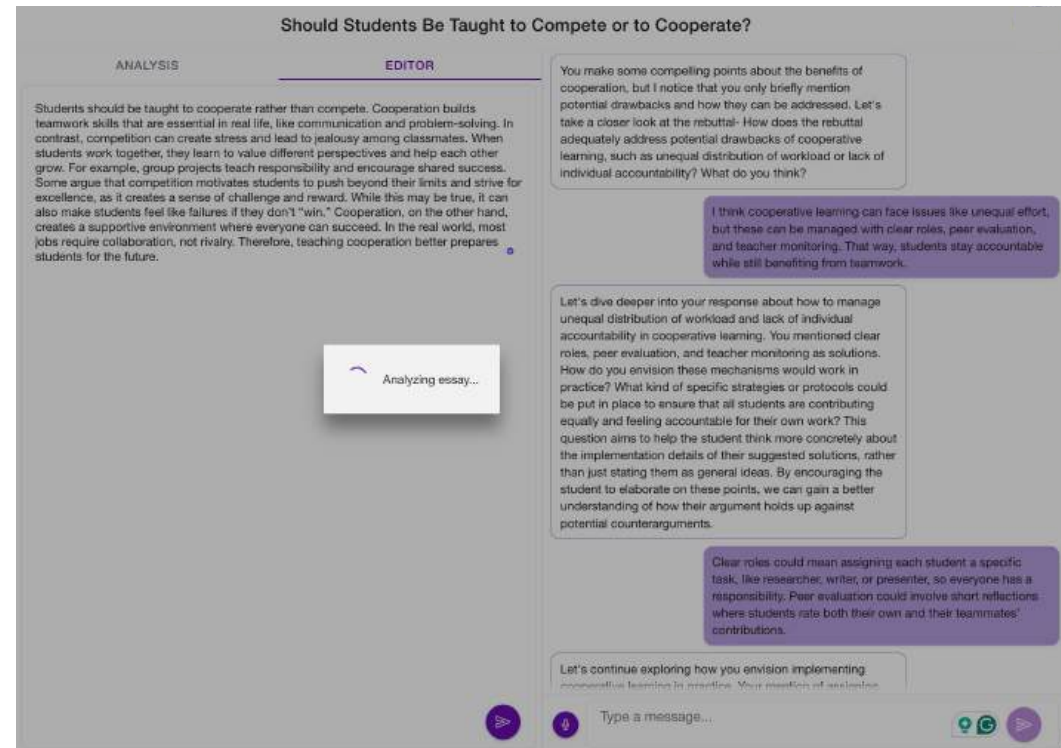
2. Maïke analyzes the text.

3. Maïke formulates a Socratic question about the weakest parts of the text.

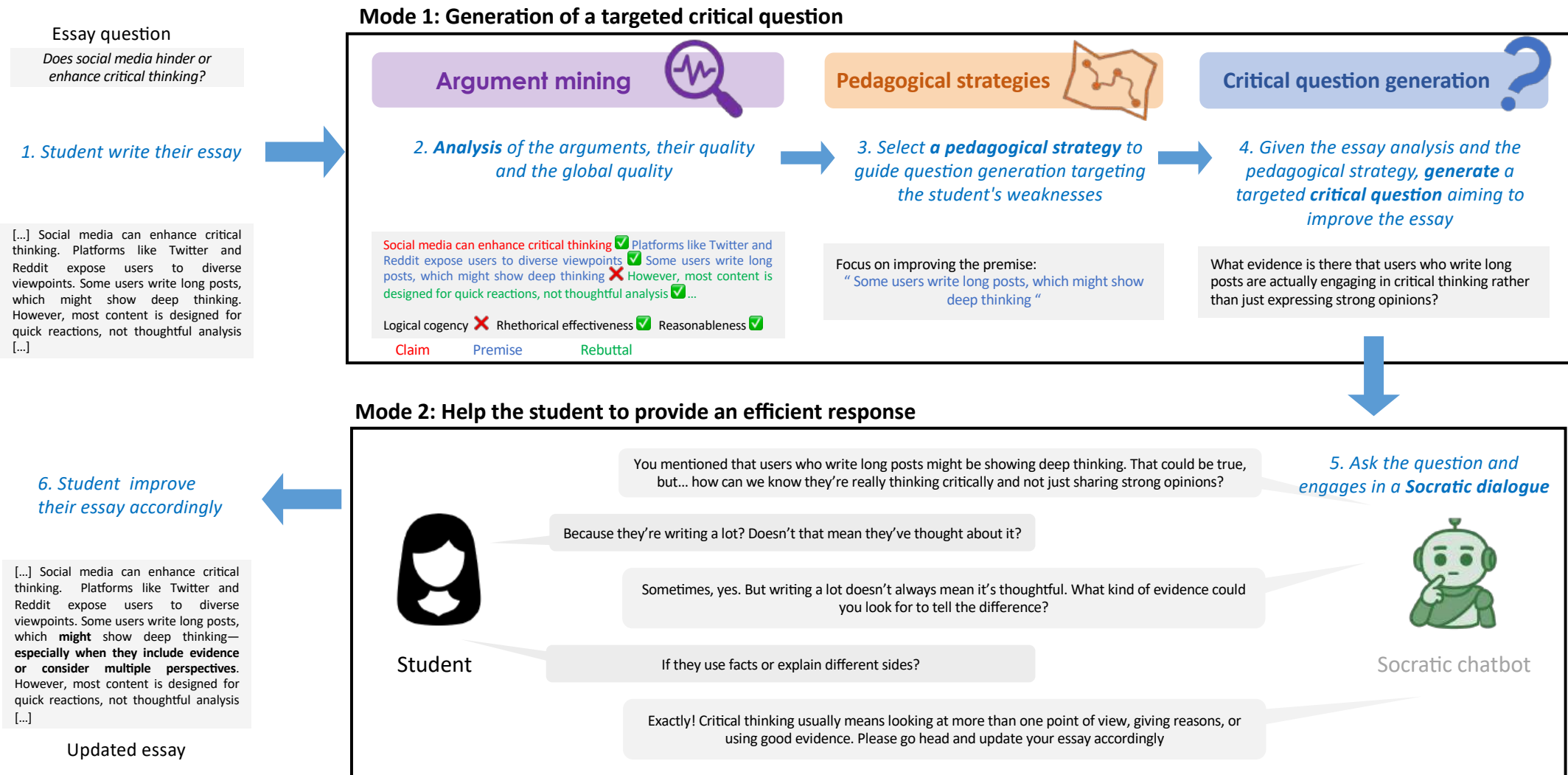
4. The student and Maïke converse...

5. The student revises their text.

6. Maïke analyzes the new text.



Frontend & UI: Marta Serrador



[2] Favero, Perez-Ortiz, Kaser, Oliver. [Towards Student-Centric AI-Supported Learning: Teaching Chatbots to Ask the Right Questions.](#) Bridge Program Collaborative AI and Modeling of Humans @ AAAI2024

Leveraging small LLMs for argument mining in education:

Argument component identification, classification, and Assessment



OBJECTIVE

Performing **argument mining** with **small open - source** LLMs:

- Component segmentation
- Type classification
- Quality assessment

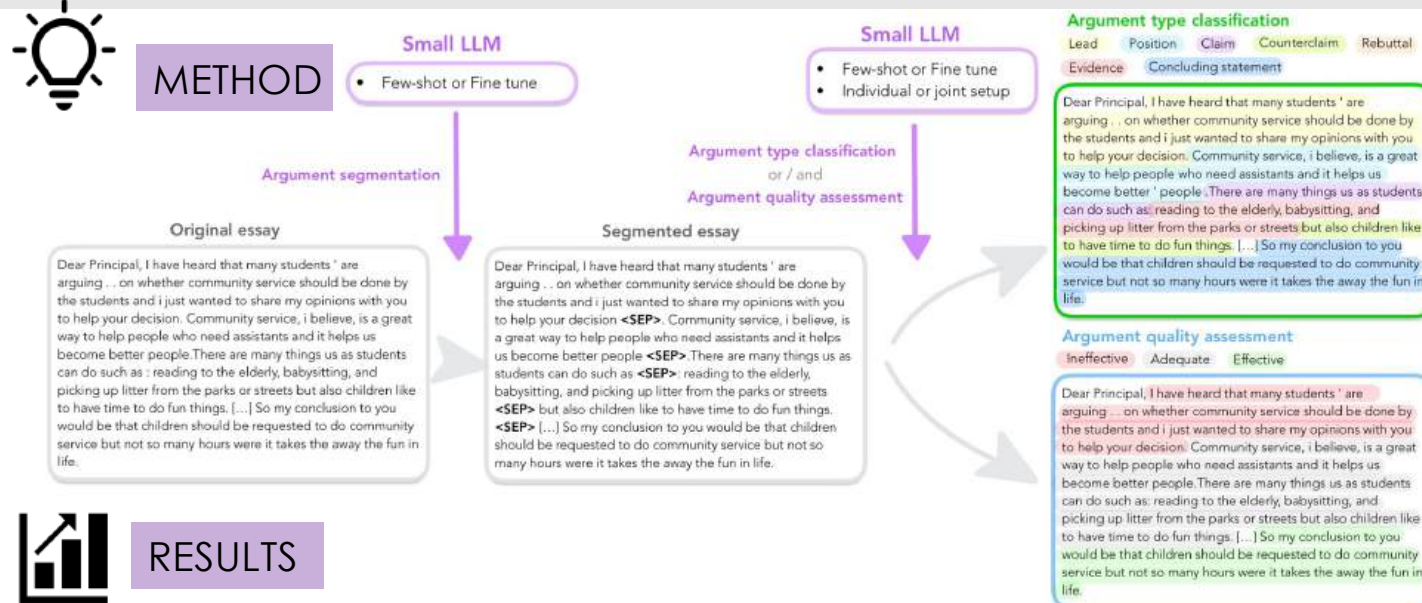


EVALUATION

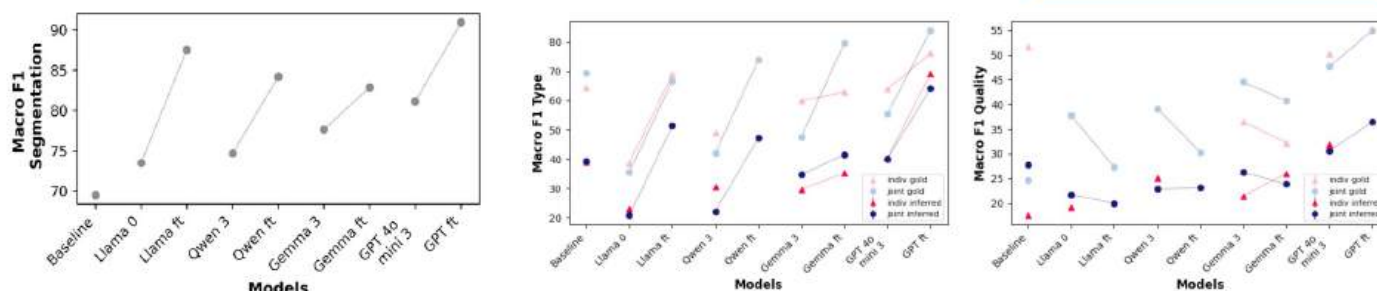
- *Dataset*: Feedback Prize
- *Metric*: Macro-averaged F1
- *Baseline*: BERT (two heads) and Longformer



METHOD



RESULTS



[5] Favero, Pérez-Ortiz, Käser, & Oliver. [Argument Mining in Education: Exploring the Potential of Open-source Small LLMs for Argument Classification and Assessment](#). *AI for Education Tools, Opportunities, and Risks in the Generative AI Era @ AAAI2025 and the 25th International Workshop on Computational Models of Natural Argument*

Winning the critical thinking questions shared task: LLM-based question generation and selection



OBJECTIVE

The dataset Interventions of real debates, annotated with *Argumentation Schemes* and a set of *Critical Questions* and their usefulness for challenging the arguments:

Useful, Unhelpful, or Invalid

The task Generate three critical questions that are Useful



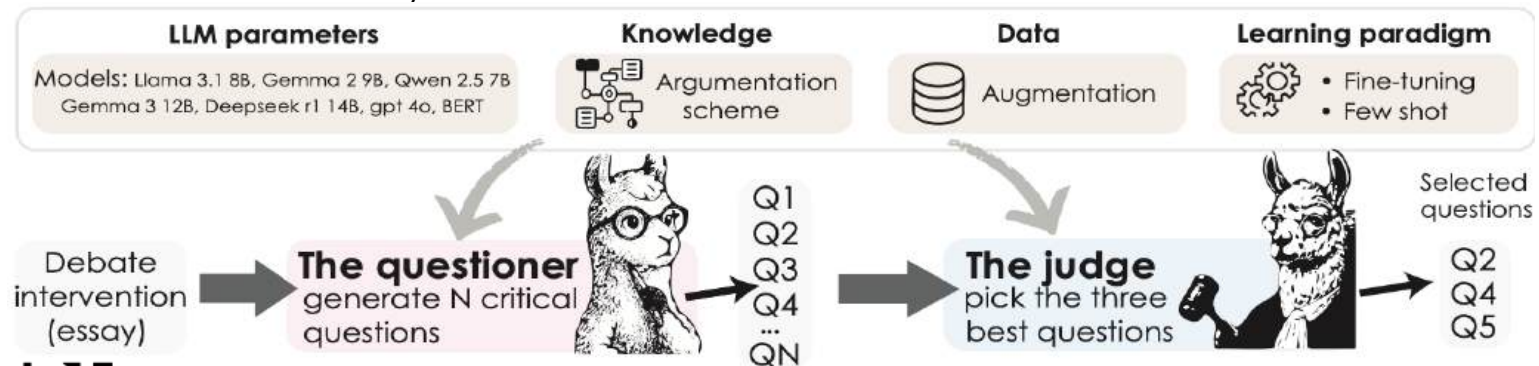
EVALUATION

- Compute **cosine similarity** of the question with the annotated references
- Limitations of automatic assessment** in such a complex and open task



METHOD

Questioner-Judge LLM architecture based on critical thinking theory: analytic, creative, and evaluative dimensions



RESULTS

Questioner	Scheme in the prompt	#Questions generated	Judge	% Useful	% Un-matched
Gemma 3 12B	without	8	-	40.5	46.0
Llama FT ***	without	8	-	56.6	29.4
Llama 3.1 8B	without	8	Deepseek 14B	57.4	27.0
Gemma 2 9B	with	8	Llama 3.1 8B	54.7	31.6
Llama 3.1 8B	with	6	Gemma 3 12B	49.4	34.1
Llama 3.1 8B	both	12	Gemma 2 9B	62.4	25.7
GPT 4o	both	12	GPT 4o	62.7	25.0

***Llama 3.1 8B fine-tuned

Best configuration

- Questioner + Judge
- With and without schemes
- Small open-source LLMs: Llama 3.1 8B, Gemma 2 9B
- Chat GPT 4o

[4] Favero, Frases, Pérez-Ortiz, Käser, & Oliver [ELLIS Alicante at CQs-Gen 2025: Winning the critical thinking questions shared task: LLM-based question generation and selection](#). 12th Workshop on Argument Mining @ACL 2025.



Enhancing critical thinking in education by means of a Socratic chatbot



OBJECTIVE

Building a Socratic chatbot:

Generation of Socratic questions by prompt and fine-tuning a pre-trained LLM



METHOD

1. **SocratiQ**: Dataset of annotated Socratic questions and answers using r/changemyview



2. Fine-tuning **Llama2 7B and 13B** **four-bit quantized** with unsloth



3. Prompt-tuning of the fine-tuned model on Ollama



EVALUATION

Compare the learner's response and the ground truth

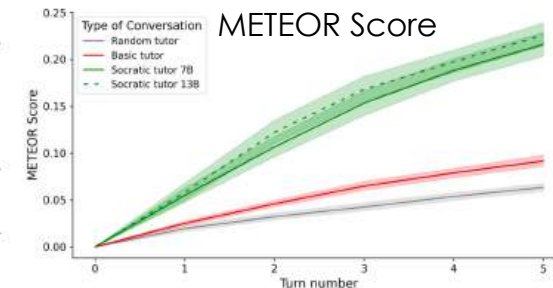
- *Generation of synthetic conversations*: prompt-tuning Llama 2 7B to simulate learner responses
- *Baselines*: 2 non-Socratic prompt-tuned tutors
- *Evaluation Dataset*: Theory of Knowledge International Baccalaureate questions



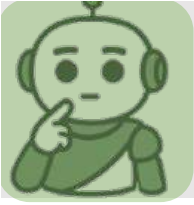
RESULTS

The Socratic tutors outperform the baselines on all metrics

Tutor type	BLEU	ROUGE-L	METEOR	BERTScore LLM	Score
Socratic Llama2 13B	3.65	0.157	0.226	0.569	0.696
Socratic Llama2 7B	3.42	0.162	0.216	0.576	0.670
Basic Llama2 7B	0.494	0.120	0.092	0.535	0.582
Random Llama2 7B	0.210	0.091	0.063	0.444	0.312



[3] Favero, Pérez-Ortiz, Käser, & Oliver [Enhancing Critical Thinking in Education by means of a Socratic Chatbot](#).
International Workshop on AI in Education and Educational Research @ ECAI 2024.



Example of conversation with Maike

Is replicability necessary in the production of knowledge?

Clarification

What do you mean by "replicability"?

Replicability means being able to reproduce or verify the results of an experiment or study by repeating it with similar methods and obtaining similar results.

Reasons

Why do you think you need replicability in order to produce knowledge?

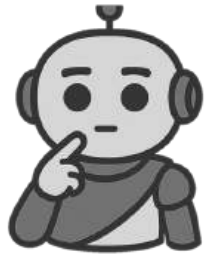
Replicability is necessary for producing knowledge because it allows us to verify and confirm the accuracy of findings through independent repetition of experiments or observations.

Alternative viewpoints

How would you respond to someone who **argues that replication is not necessary** in this case because the sample size was so small?



Learner



Socratic
chatbot

Next steps

App development

Building a conversational interface as a functional software tool

Chatbot improvement

Reinforcement learner: construction of an optimal learning path

Personalization to improve student engagement and outcomes

User study

International Bacalaureat



At EPFL, Prof. Tanja Käser



Collaboration

Automated Essay Scoring



Thank you for your attention



- **Project presentation:** <https://ellisalicante.org/maike>
- **Posters:**
 - <https://web.ua.es/de/phdinf/documentos/jdi-2024/lucilealysfavero.pdf>
 - <https://web.ua.es/es/phdinf/documentos/jdi-2025/lucilealysfaveromontero.pdf>
- **Scientific papers:** <https://ellisalicante.org/people/lucilefavero-en/>
- **Talk:** <https://web.ua.es/en/iuii/noticias/talk-lucile-favero-towards-student-centric-ai-supported-learning-teaching-chatbots-to-ask-the-right-questions.html>
- **Contact:** lucile@ellisalicante.org <http://lucilefavero.github.io/>



Publications

2025

- 12/12 **Favero, L. A., Pérez-Ortiz, J. A., Käser, T., & Oliver, N.** (2025). [Leveraging Small LLMs for Argument Mining in Education: Argument Component Identification, Classification, and Assessment](#). *The 25th International Workshop on Computational Models of Natural Argument (CMNA'25)*.
- 07/31 **Favero, L. A., Frases, D., Pérez-Ortiz, J. A., Käser, T., & Oliver, N.** (2025). [ELLIS Alicante at CQs-Gen 2025: Winning the critical thinking questions shared task: LLM-based question generation and selection](#). *12th Workshop on Argument Mining, co-located with ACL 2025*.
- 07/22 **Favero, L. A., Pérez-Ortiz, J. A., Käser, T., & Oliver, N.** (2025). [Do AI tutors empower or enslave learners? Toward a critical use of AI in education](#). *Applications of generative AI to support teaching and learning in higher education, co-located with AIED 2025*.
- 03/03 **Favero, L. A., Pérez-Ortiz, J. A., Käser, T., & Oliver, N.** (2025). [Argument Mining in Education: Exploring the Potential of Open-source Small LLMs for Argument Classification and Assessment](#). *AAAI2025 AI for Education - Tools, Opportunities, and Risks in the Generative AI Era*.
- 02/20 **Favero, L. A., Pérez-Ortiz, J. A., Käser, T., & Oliver, N.** (2025). [Leveraging Small LLMs for Argument Mining in Education: Argument Component Identification, Classification, and Assessment](#). *arXiv:2502.14389*.

2024

- 10/19 **Favero, L. A., Pérez-Ortiz, J. A., Käser, T., & Oliver, N.** (2024). [Enhancing Critical Thinking in Education by means of a Socratic Chatbot](#). *International Workshop on AI in Education and Educational Research, ECAI 2024 workshop*.
- 02/21 **Favero, L. A., Pérez-Ortiz, J. A., Käser, T., & Oliver, N.** (2024). [Towards Student-Centric AI-Supported Learning: Teaching Chatbots to Ask the Right Questions](#). *Collaborative AI and Modeling of Humans, AAAI Bridge Program*.