

The Effects of an Instructional Intervention to Foster the use of the Selection and Organization of Ideas as a Learning Strategy

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UNIVERSIDAD
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DE COLOMBIA



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This study was performed in the Universidad Nacional de Colombia



From:

<http://www.colombiainfo.org/Portals/0/Images/Colombia/Wereldmap-Grijs-Colombia-Geel.png>

http://4.bp.blogspot.com/-uzFNRm4DBB0/UaVWo0fEFWI/AAAAAAAAAFKQ/nmJY37Oxyz0/s1600/campus_universitario.jpg

The Faculty of Engineering offers nine programs



**Agricultural
Engineering**



**Electrical
Engineering**



**Mechanical
Engineering**



**Building
Engineering**



**Electronics
Engineering**



**Mechatronics
Engineering**



**Computer
Engineering**



**Industrial
Engineering**



**Chemical
Engineering**

From:
<https://www.ingenieria.bogota.unal.edu.co/formacion/pregrado#programas-ofertados-2>

Self – Regulated Learning based on educational psychology:

“Self –regulated learning is an active, constructive and goal directed process where learners monitor, regulate, and **control their cognition**, motivation, emotions, and behavior, guided and constrained by their goals and contextual features in the environment”

Pintrich proposed three types of learning strategies

Cognitive Strategies

Organization of ideas	"I make simple charts, diagrams, or tables to help me organize course material"
Elaboration of ideas	"When I study I relate the previous and new knowledge"
Critical thinking	"I consider that this conclusion have not evidences"

Metacognitve Strategies

Planning	"When I study for this class, I set goals for myself in order to direct my activities in each study period"
Monitoring	"I ask myself questions to make sure I understand the material I have been studying in this class"
Adjustment	"I adapt my study methods"

Pintrich proposed three types of learning strategies

Resources Management	
Time to study	“I effectively use my study time”
Place to study	“I avoid distractions controlling my study environment”
Peer learning	“I discuss and solve questions about study topics with my peers”
Effort regulation	“I persevere, work hard and control my attention to achieve learning objectives”

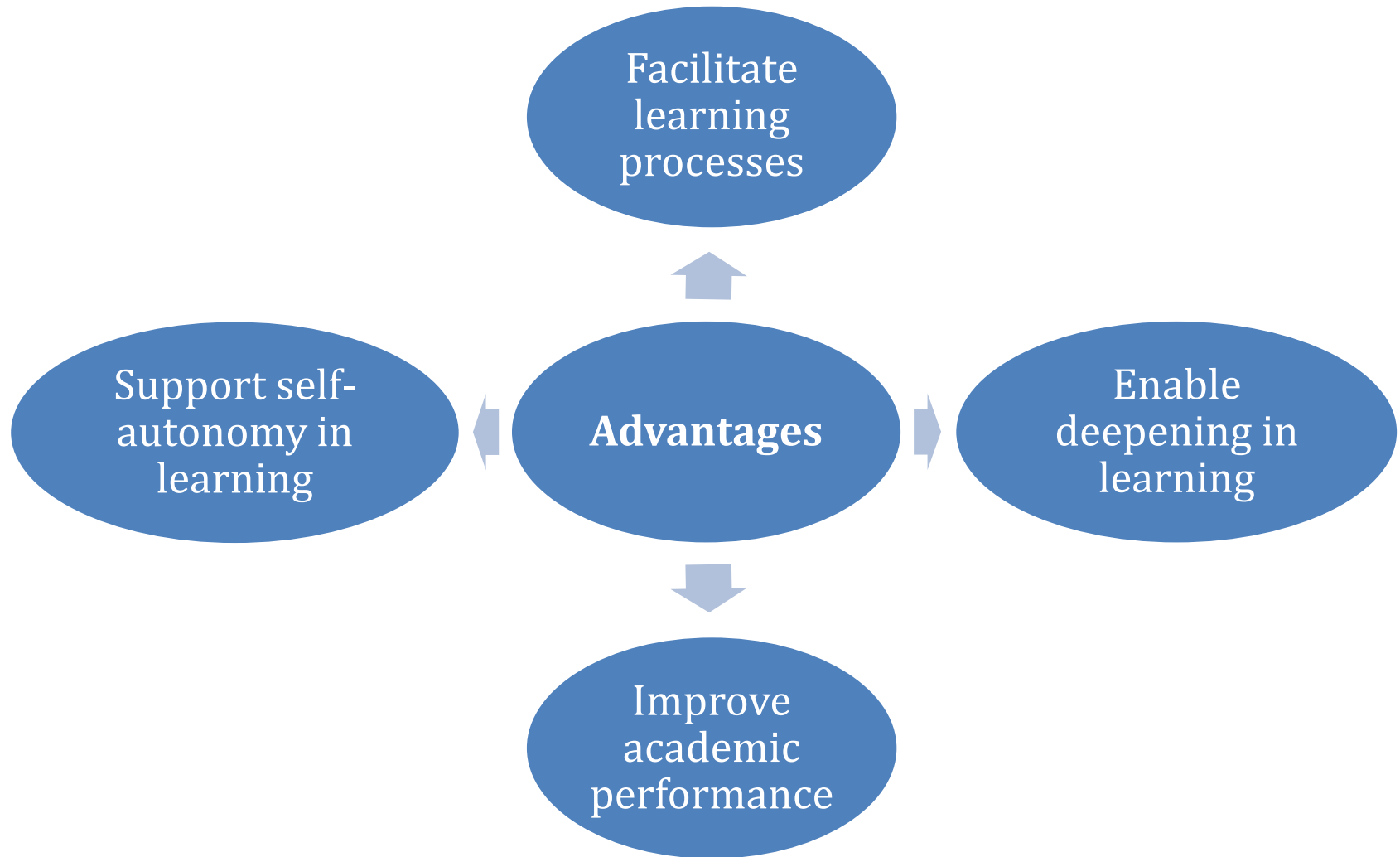
Pintrich, P., & Others, A., *A Manual for the Use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Ed: National Center for Research to Improve Postsecondary Teaching and Learning, Office of Educational Research and Improvement, Washington, DC, (1991)

Pintrich also proposed a self-report questionnaire to assess the use of these strategies: *Motivated Strategies for Learning Questionnaire (MSLQ)*

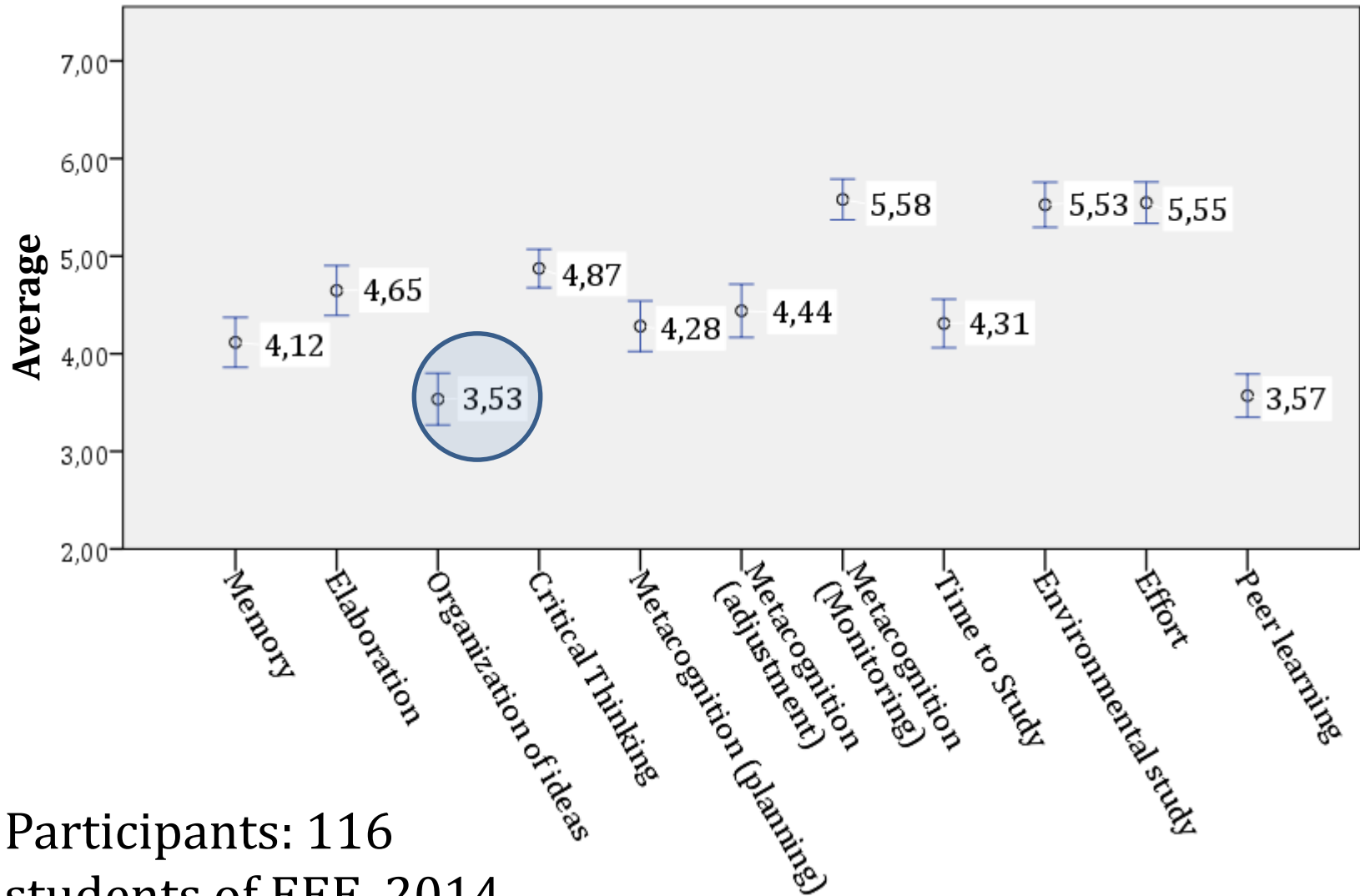
MSLQ	
Number of items	81
Dimensions	Motivation for learning
	Learning strategies
Rate	Students rate themselves on a seven point Likert scale from "not at all true of me" to "very true of me."

Pintrich, P., & Others, A., *A Manual for the Use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Ed: National Center for Research to Improve Postsecondary Teaching and Learning, Office of Educational Research and Improvement, Washington, DC, (1991)

The advantages of using learning strategies

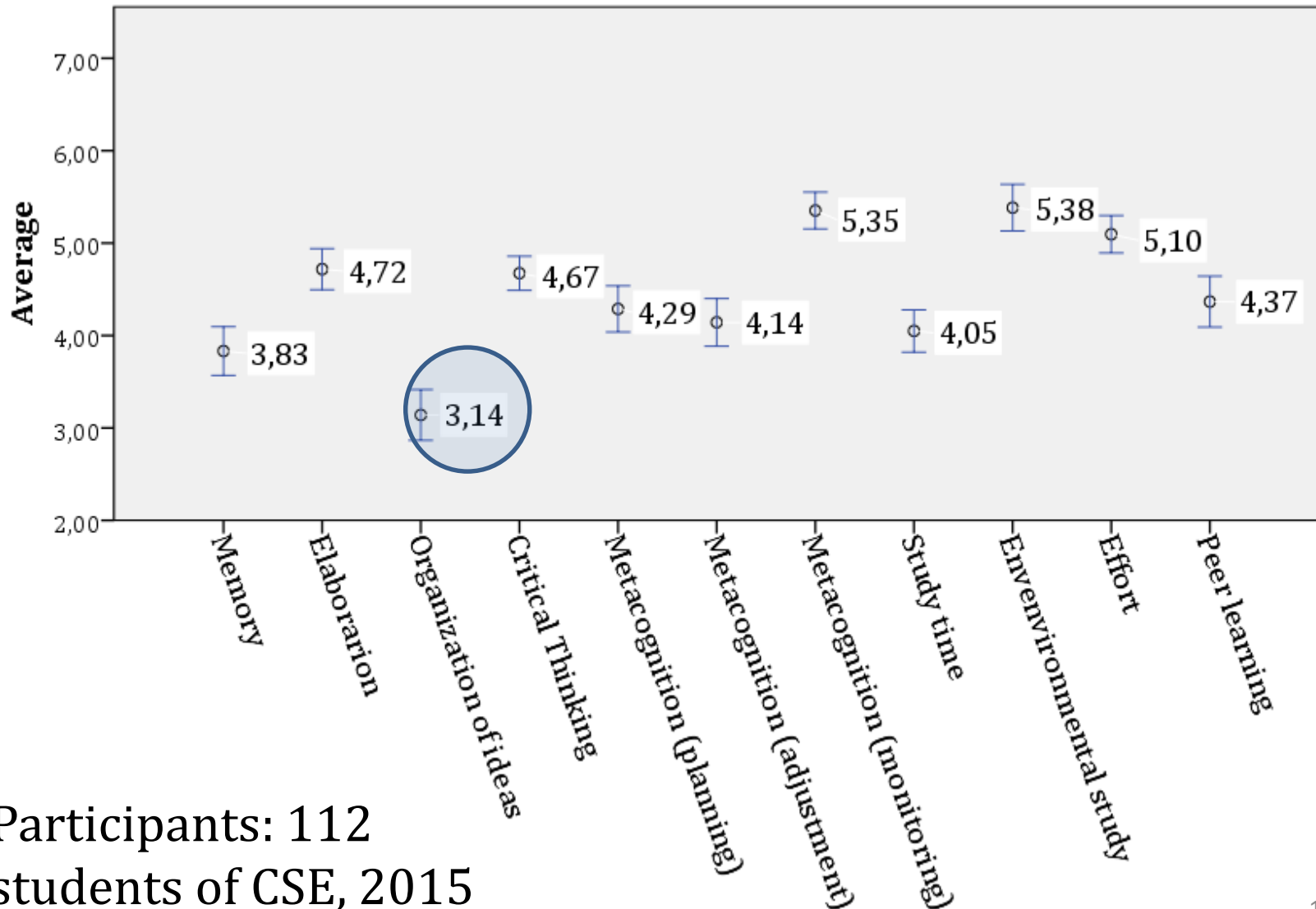


Our students are not used to employ “organization of ideas” as a learning strategy



Participants: 116
students of EEE, 2014

Similar results were observed through a study developed with students of other program



Participants: 112
students of CSE, 2015

Organization of ideas as learning strategy

“Through the organization of information, the student selects the main ideas of the subject, summarizes the topics to learn and, ultimately, **processes significantly (knowledge)** the information it receives.”

From:

M. Marugán, L. Martín, J. Catalina y J. Román, «Cognitive elaboration strategies and their content nature in university students», *Psicología Educativa*, vol. 19, nº 1, pp. 13-20, 2013.

Study purpose

Design, implement and assess an educational intervention to foster the “organization of ideas” as a learning strategy in Electric and Electronics Engineering freshmen of UNAL

This study involved five phases:



Participant selection

Pre-test
(MSLQ-
Colombia)

Educational
intervention

Evidence
collection

Data
analysis

Two groups of engineering students participated in the study

Group	Students	Age	Sex
Electrical and Electronics Engineering	95 students	19,3 years	8 women 87 men
Mechatronic Engineering	65 students	18,4 years	13 women 52 men

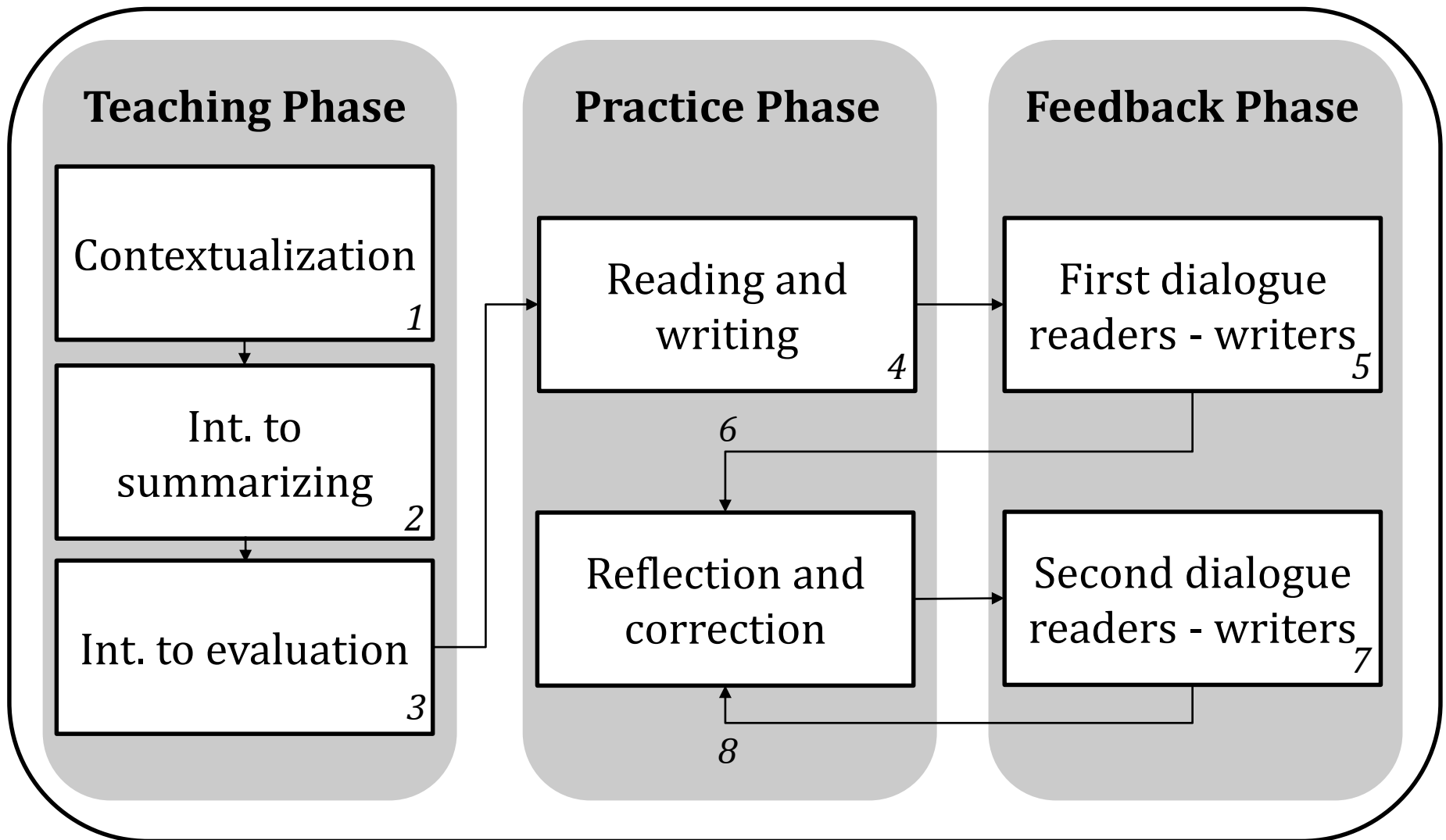
Before conducting the educational intervention, the use of strategies to organize ideas was assessed through MSLQ-Colombia.

The MSLQ considers four techniques related to organization of ideas

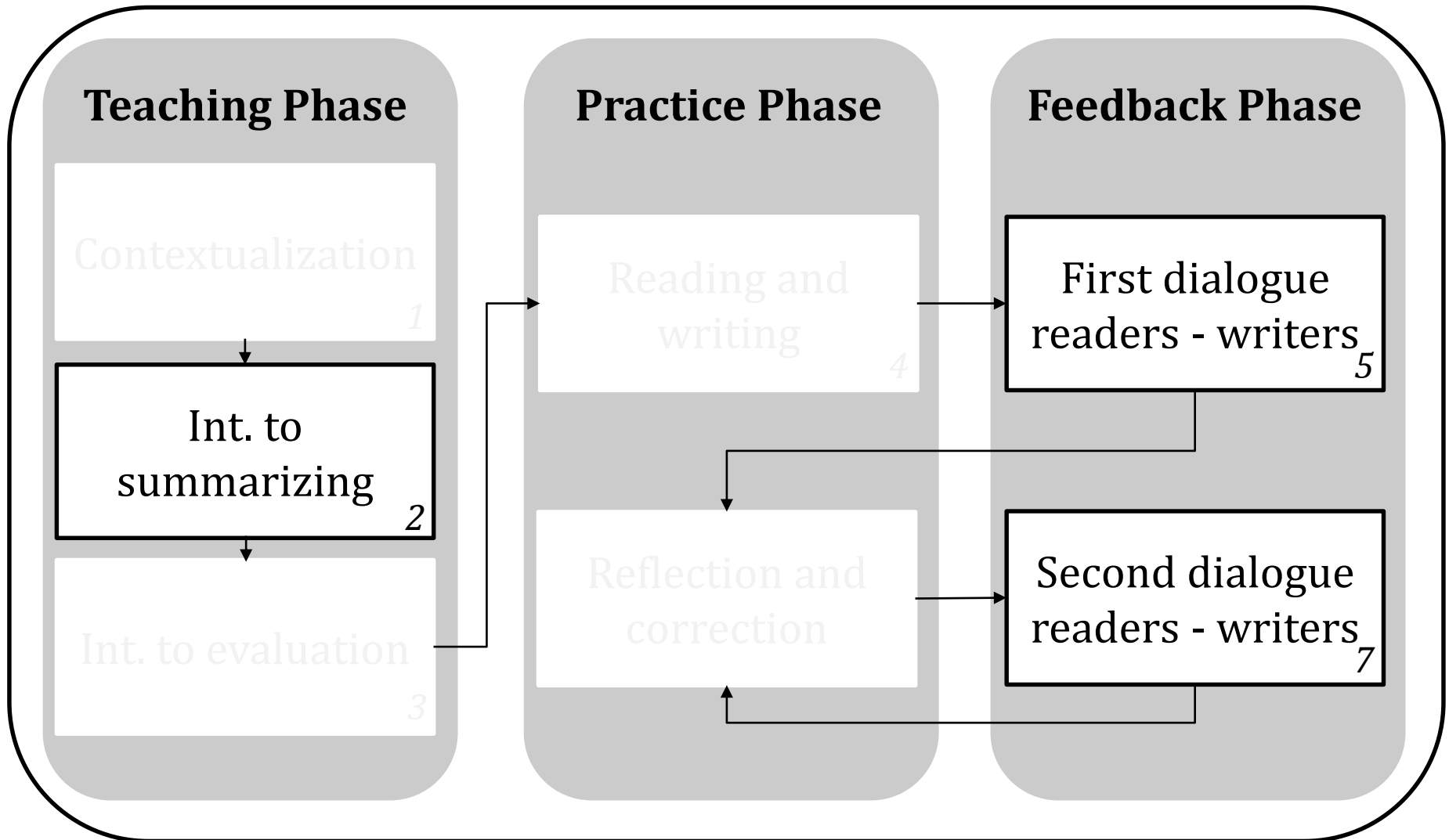
Organization of ideas as learning strategy (MSLQ)

1	When I study the readings for this course, I outline the material to help me organize my thoughts. (<i>Outline</i>)
2	When I study for this course, I go through the readings and my class notes and try to find the most important ideas. (<i>Main idea</i>)
3	I make simple charts or tables to help me organize course material. (<i>Tables</i>)
4	When I study for this course, I go over my class notes and make an outline of important concepts. (<i>Diagrams</i>)

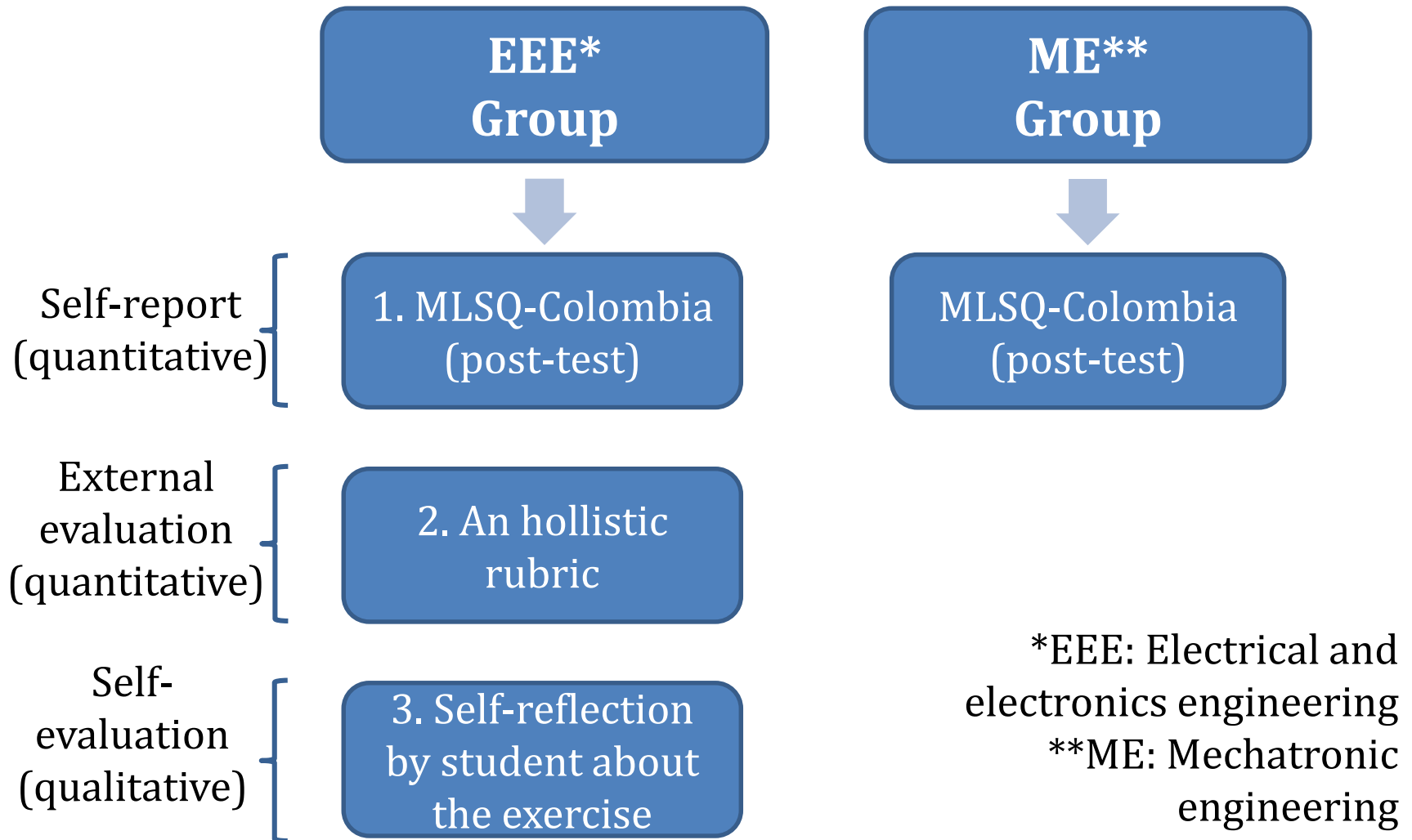
The educational intervention involved three phases: instructional, practice and feedback



Senior Literature students were involved in several phases of this educational intervention

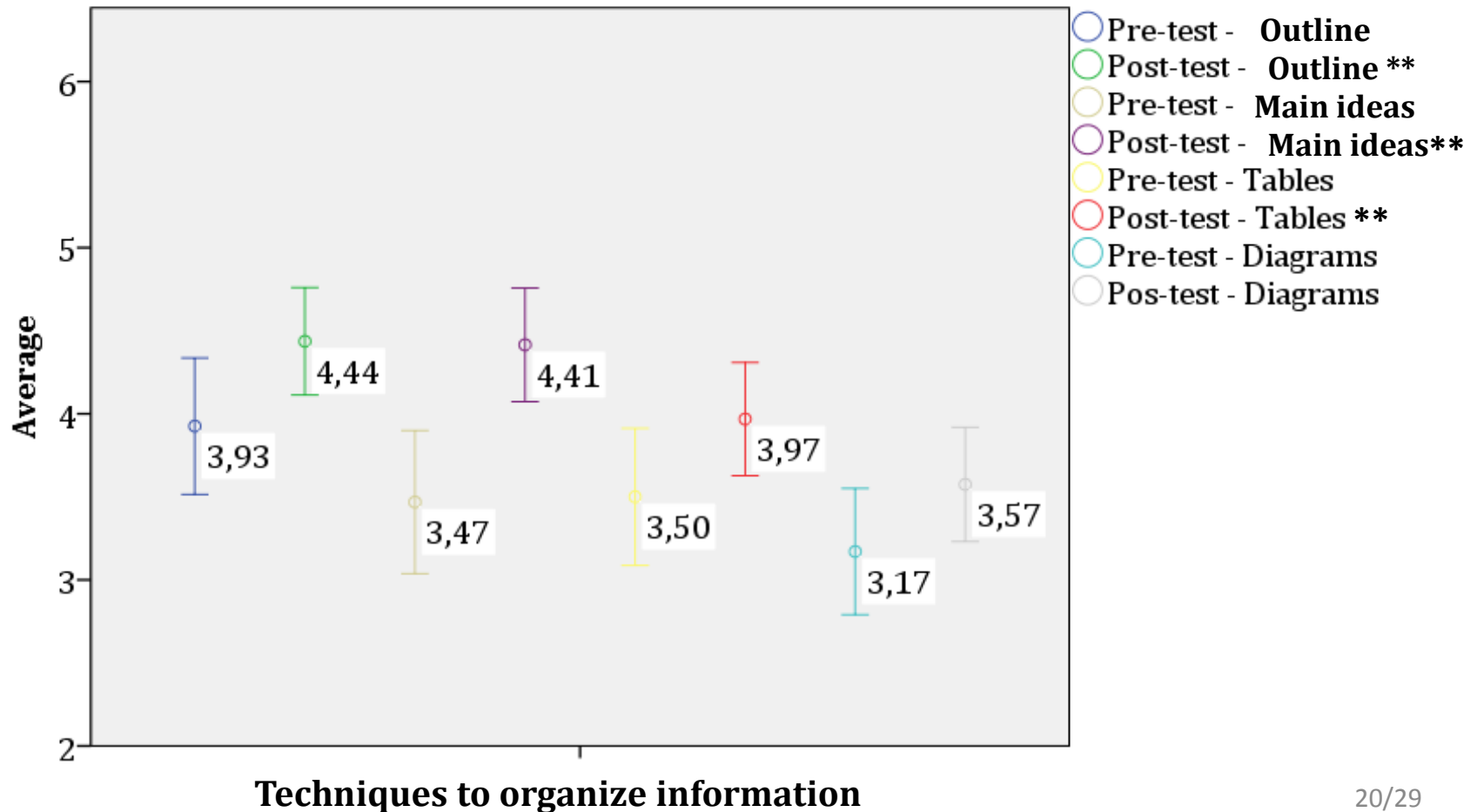


Three assessment tools were used to collect evidence after the educational intervention



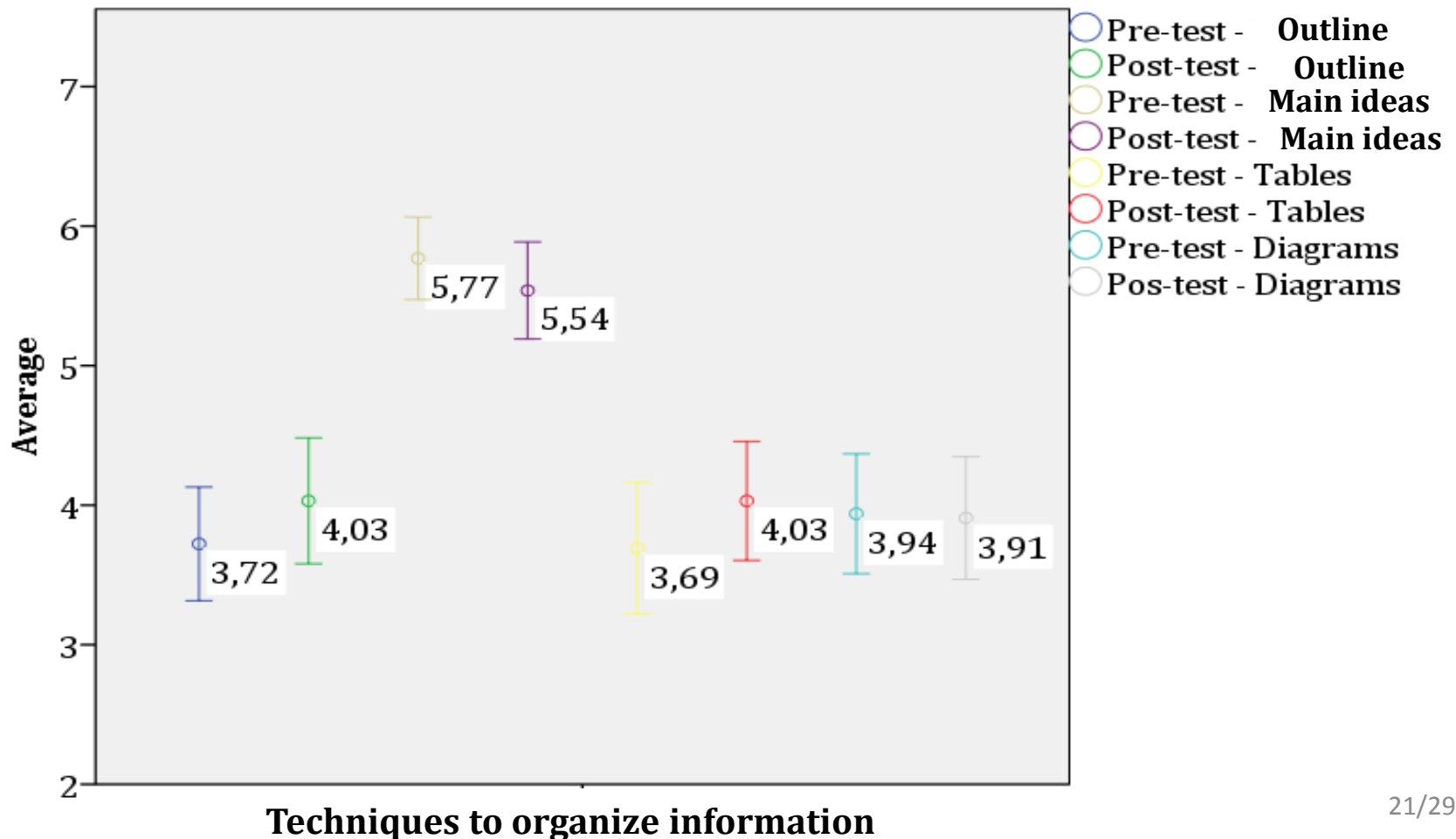
MSLQ-Colombia results indicated that students of **EEE Group** increased significantly their use of three techniques to organize information

Descriptive statistics MSLQ-Colombia



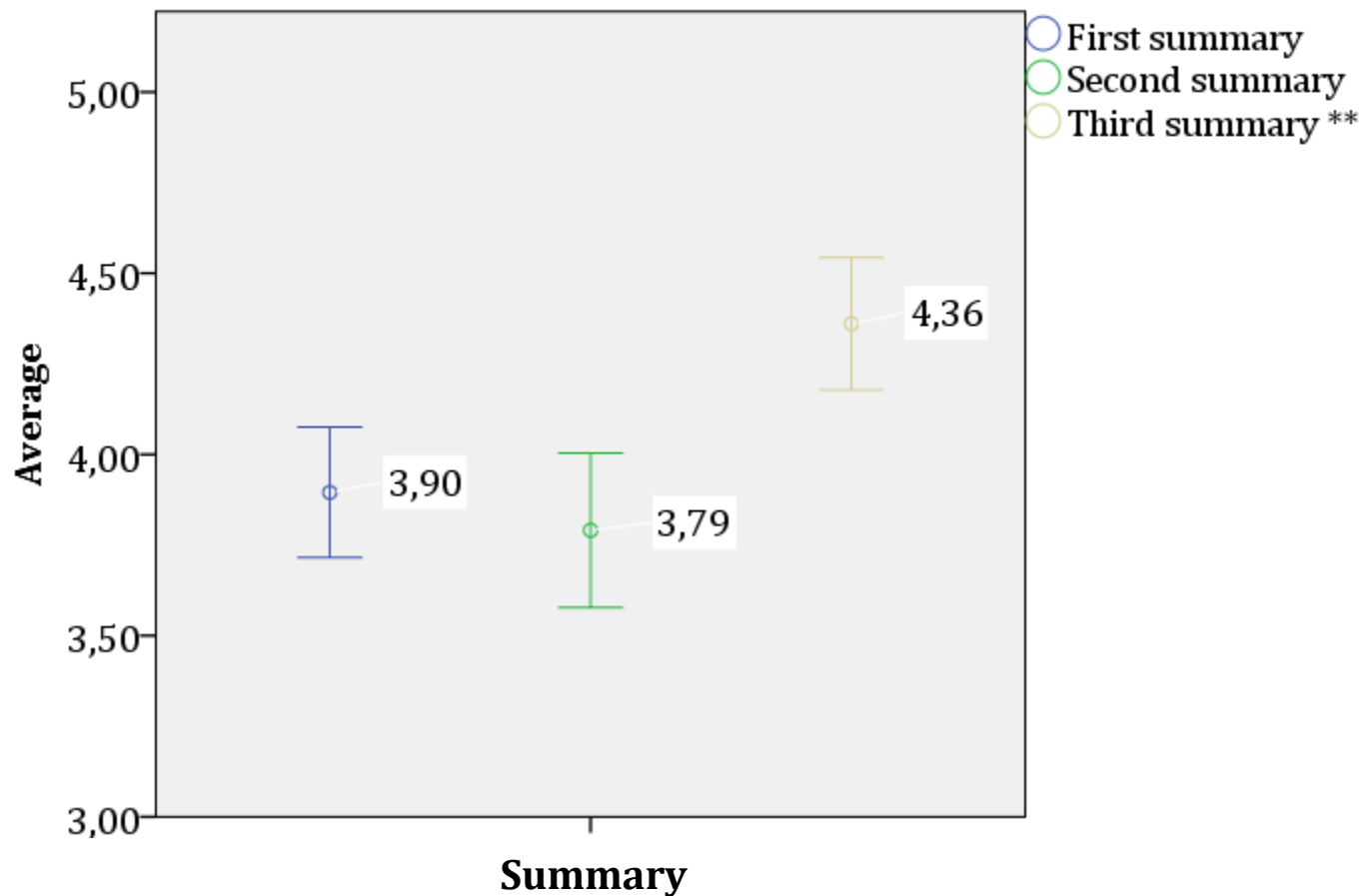
MSLQ-Colombia results indicated that students of **ME Group** did not increase significantly their use of techniques to organize information

Descriptive statistics MSLQ-Colombia



Rubrics indicated that **EEE Group** students improved their abilities to identify the main ideas of technical texts

Identification of the main idea of the text



The MSLQ results are consistent with rubric results

The **MSLQ** results (self-report) indicated that students self-perceived that they **increased** the **use** of several **techniques to organize the information**.

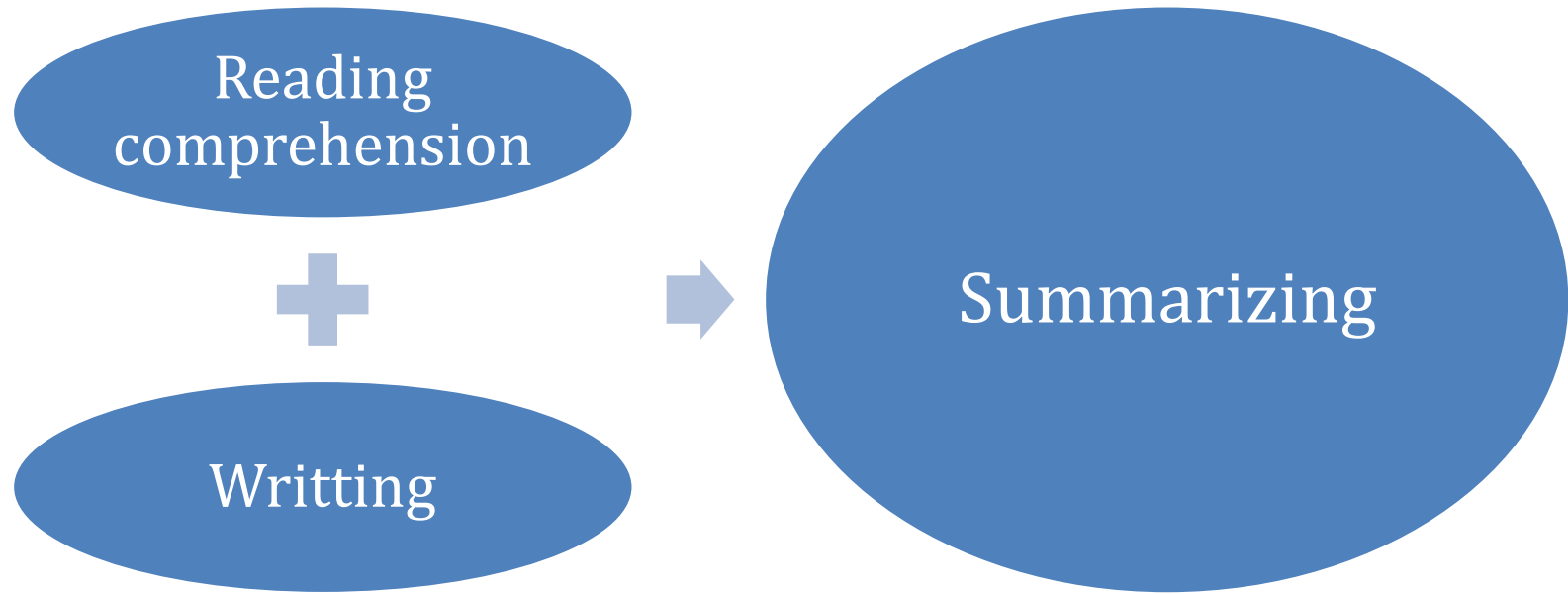
The **rubric** results (external evaluation) confirm that: as students practice the mentioned techniques, which are required to write their summaries, they **improved** their **skills to identify the main ideas** of the texts.

Self-reflection of a student about the exercise

“...It’s complicated to read three or four documents and then **identify the ideas of everything I read**; it’s easier and more organized if I pull out the ideas as I read, and then **get the hierarchy**, it also concludes in a better analysis of the text.” *(a student reflection after developing the first summary).*

When I study for this course, I go through the readings and my class notes and try to find the most important ideas.

Summarizing enable fostering skills to organize ideas and writing competences



When going through these processes, the students fostered not only the strategies to organize ideas, but also their competences for academic writing.

Self-reflection by student about the exercise

“These practices helped me strengthen writing competences, since **they improved my capability to find relevant parts within a text**, to use punctuation marks correctly, have an accurate cohesion throughout writing, and contributed to broaden my critical thinking.” *(a student reflection after developing the third summary).*

Conclusions

The educational intervention proposed in this study helped students to **increase the level of usage** of three techniques to organize information: **outline, identification of main ideas and summarizing through tables.**

The technique of *diagrams* (graphic strategy) was not fostered by students.

Conclusions

The participants said this exercise helped them:

- Learning how to organize information through the hierarchization of ideas
- Improving academic writing skills

Thanks for your attention
Questions and opinions

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