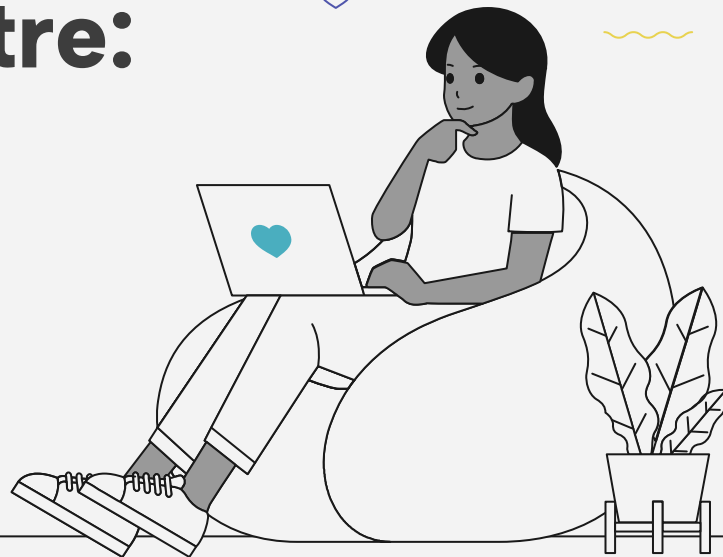




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# SGS Innovation Centre: Pioneering Educational Excellence Through Research



# Using AI...

...to enhance the Teaching and  
Learning of Maths Through Active  
Metacognition and Transformative  
Assessment



# Population

## 01

### Students

88 Tenth Grade students:  
3 classrooms

## 03

### 1 Head of Dept.

Head of Department

## 02

### 1 Teacher

Mathematics teacher

## 04

### 1 Coach

Educational coach

# Research Questions



1.

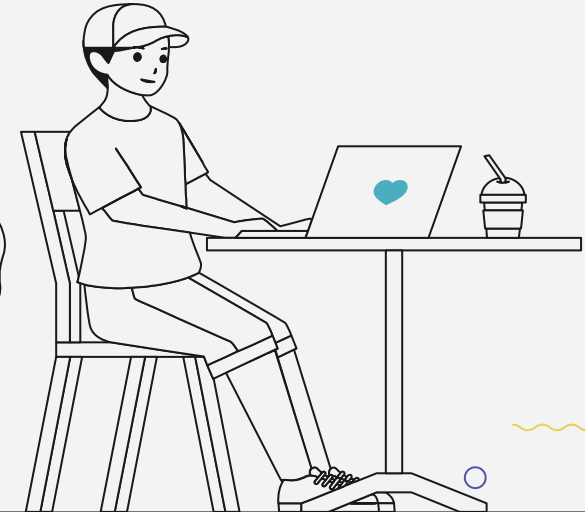
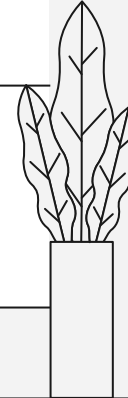
How do students in the 11th Grade feel about the teaching and learning methods in Maths?

2.

Which is the most appropriate artificial intelligence platform to assist students at Saint George's School in enhancing the teaching and learning processes in mathematics in 10th Grade?(According to students and teachers).

3.

What are the beliefs and expectations regarding the utilisation of artificial intelligence in the classroom by the mathematics teacher?



# Data collection procedure

<u>WHAT WAS DONE</u>	<u>WHAT IS WAS DONE FOR</u>
Survey (65 11th Grade students)	To review their perception of the maths class and to identify areas for improvement
Focused group meetings with 9 students	To gain a deeper understanding of their experiences
An interview with the maths teacher	To review his perceptions
Comparative data analysis of mathematics outcomes for 10th Grade from the past five years	To identify trends and areas requiring enhancement in the subject
Survey (153 students)	To review the use of artificial intelligence platforms in mathematics
Three classroom observations were recorded	To analyse the use of technology and AI in teaching, student engagement and classroom dynamics before implementing new methodologies.
Survey (88 10th Grade students)	To assess metacognitive awareness (Metacognitive Awareness Inventory) (MAI): Schraw & Dennisonn (1994)



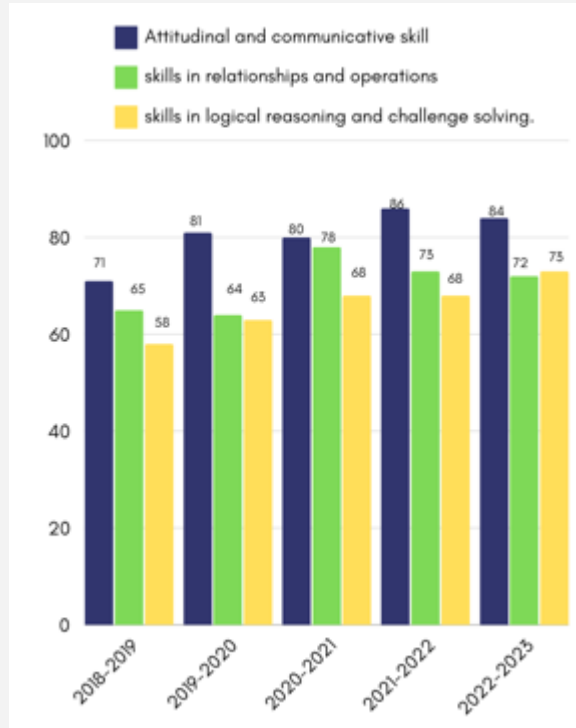
# Key Findings



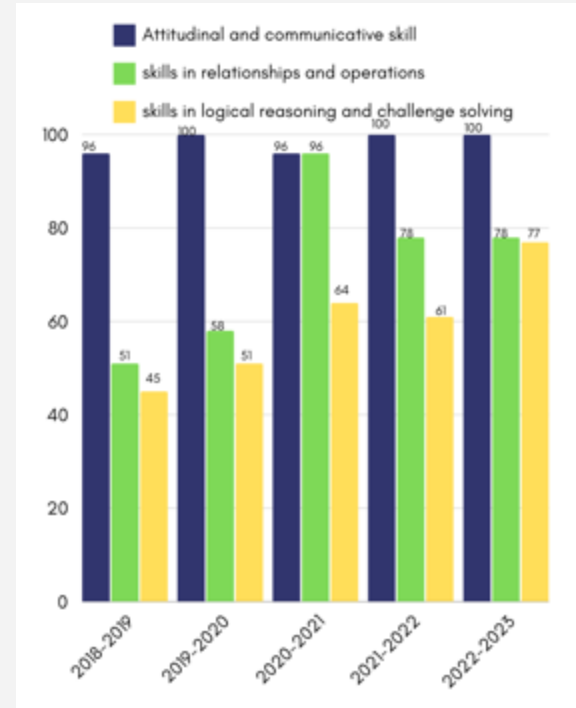
# Problem-solving



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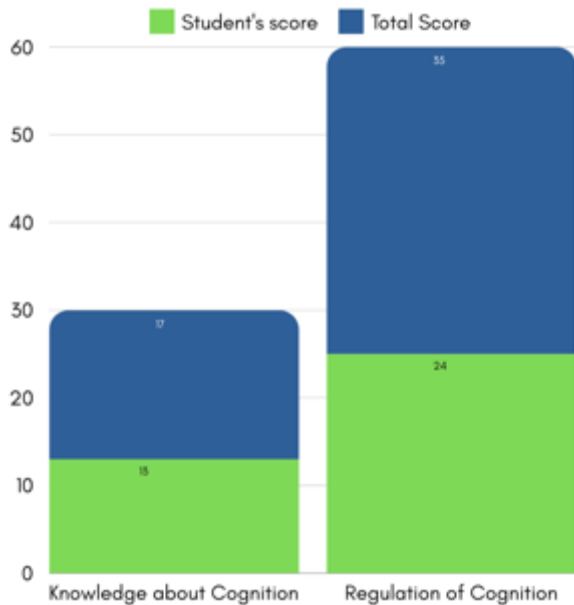
Average per skill



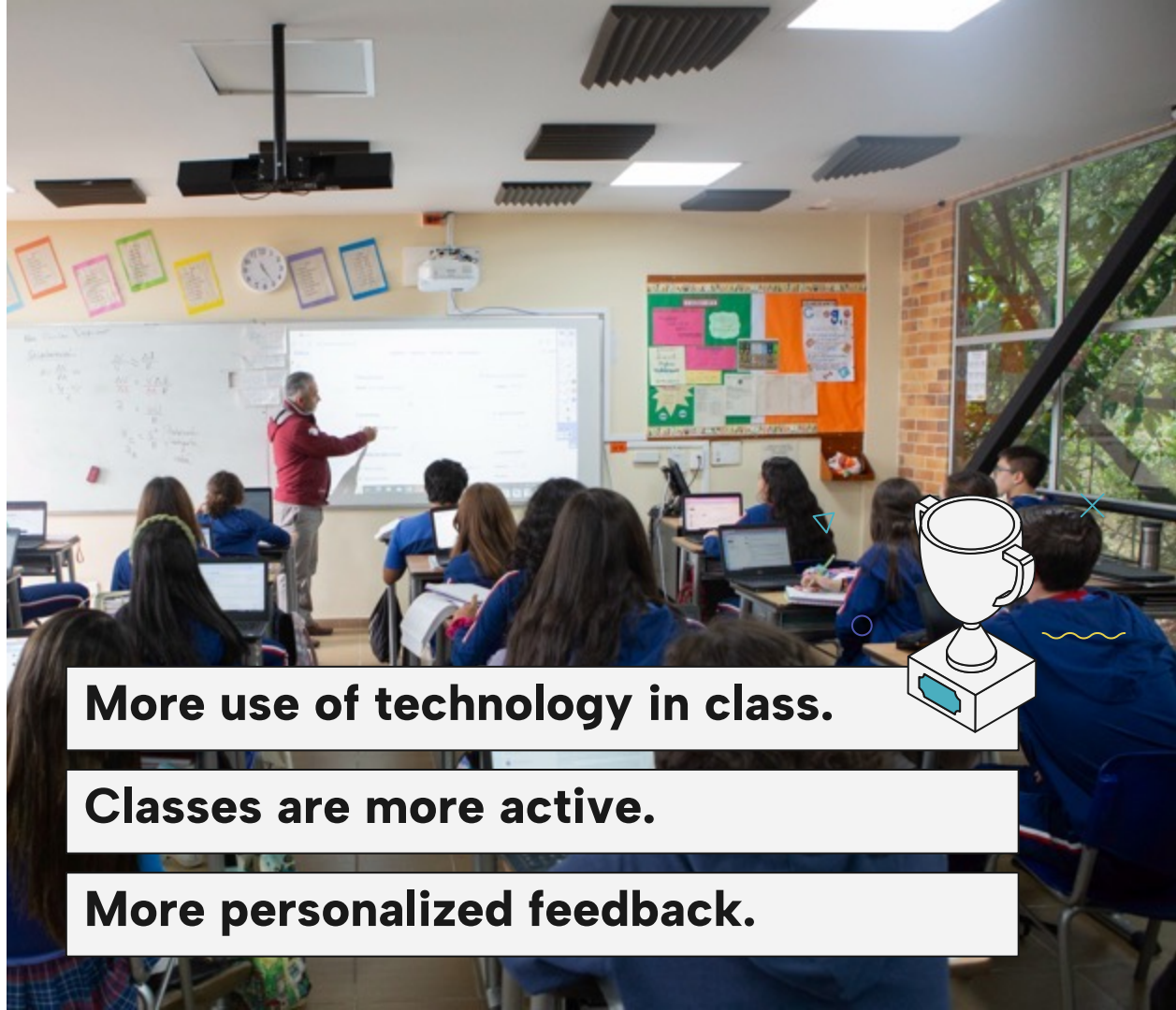
Percentage of approval by skill



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Metacognition



**More use of technology in class.**

**Classes are more active.**

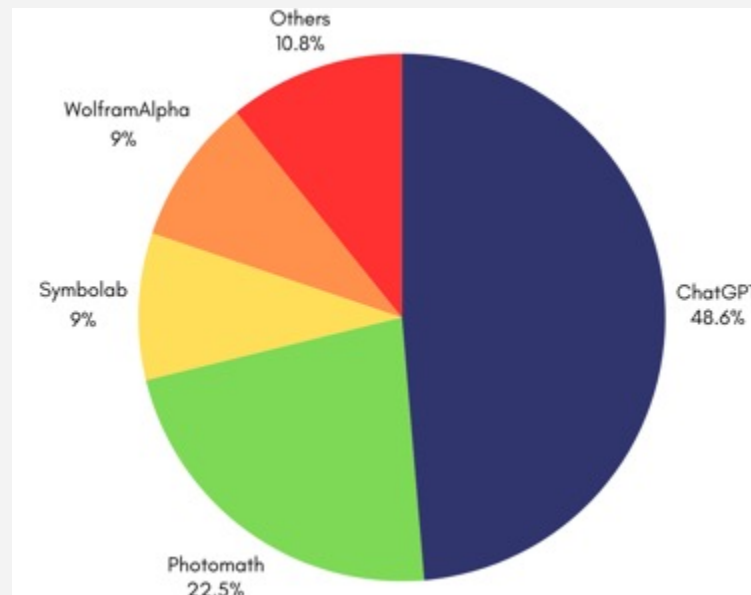
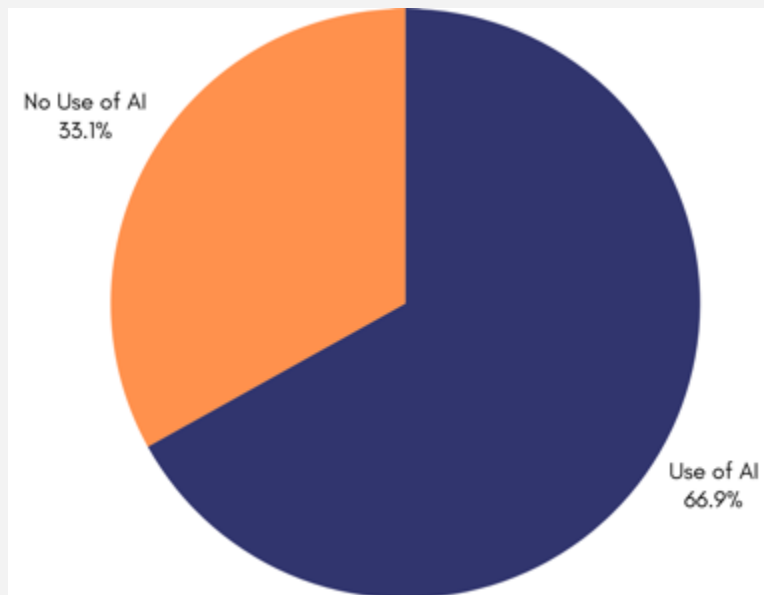
**More personalized feedback.**







# Use of AI Platforms





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# Action Plan

- Professional Development
- Development of metacognitive skills in students



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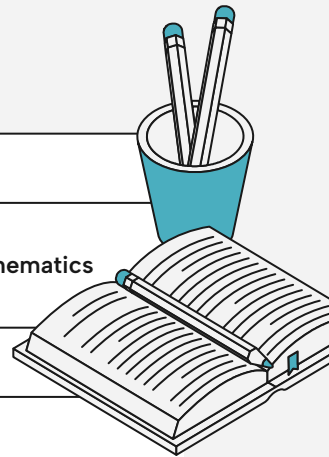
# Daniel Correal

## CO-Founder EDUCO

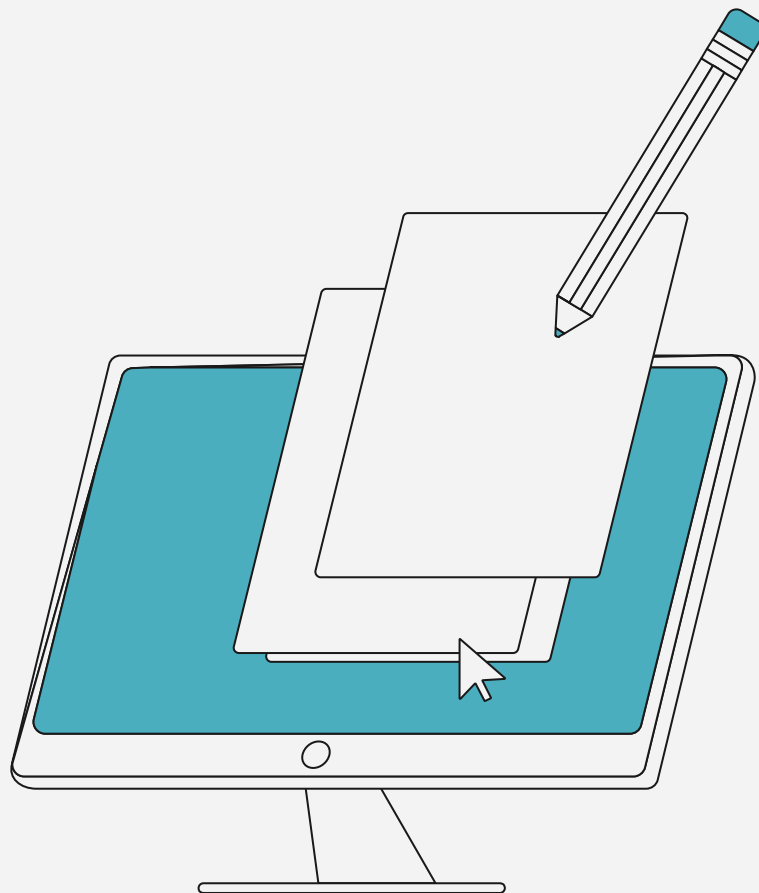


# Data collection procedure

<u>WHAT WAS DONE</u>	<u>WHAT IS WAS DONE FOR</u>
<b>Structured Dialogue Sessions</b>	To review objectives, success criteria and planning To review objectives in the implementation of AI Platforms in mathematics education
<b>Focused group meetings with 9 students</b>	To gain a deeper understanding of their beliefs and experiences
<b>A survey to the maths teacher</b>	To review his perceptions
<b>Comparative data analysis of mathematics outcomes for 10th Grade</b>	To compare the results from the previous 6 years and see if there was an improvement this year
<b>Survey (88 students)</b>	To review the usage of the platform
<b>Survey (88 Tenth-Grade students)</b>	To assess metacognitive awareness (Metacognitive Awareness Inventory (MAI): Schraw & Dennisonn (1994)
<b>Interview with school leaders</b>	To review the next steps to take



# Key Findings



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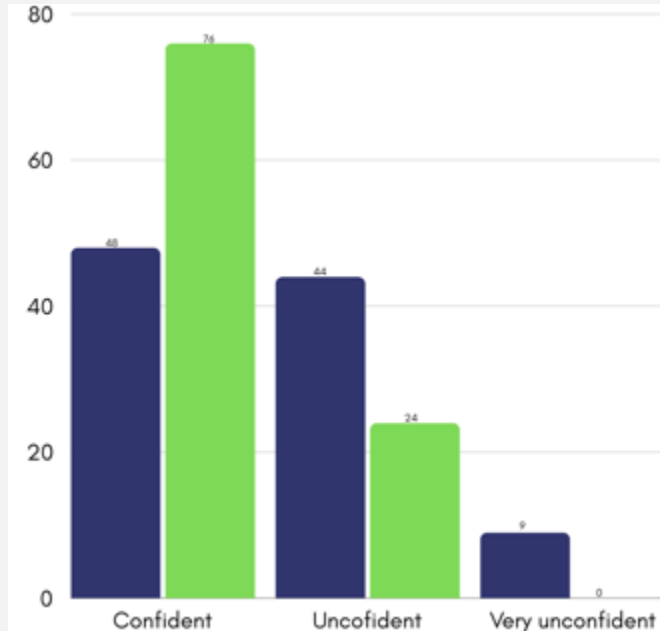
# Survey: Use of AI Platform



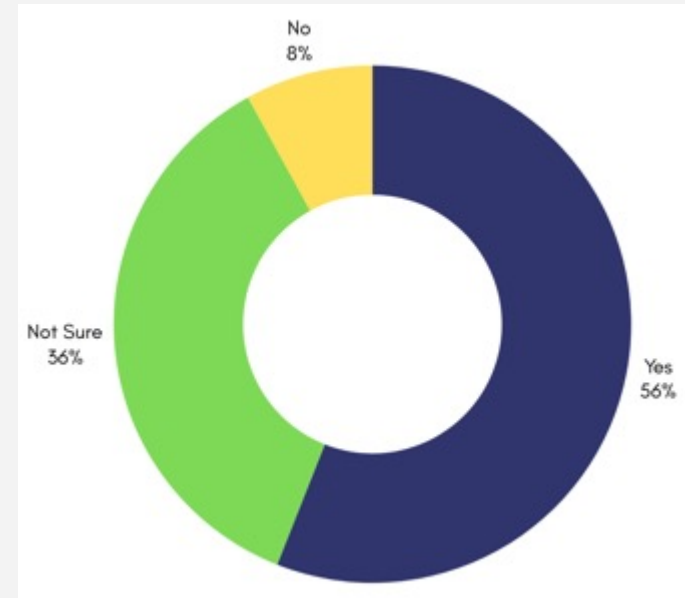
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How confident do you feel now in solving mathematics problems on you own?

The was a 13% of change in the improvement in confidence in problem-solving



Did the platform (EDUCO) help you to thing more critically about mathematics problems?

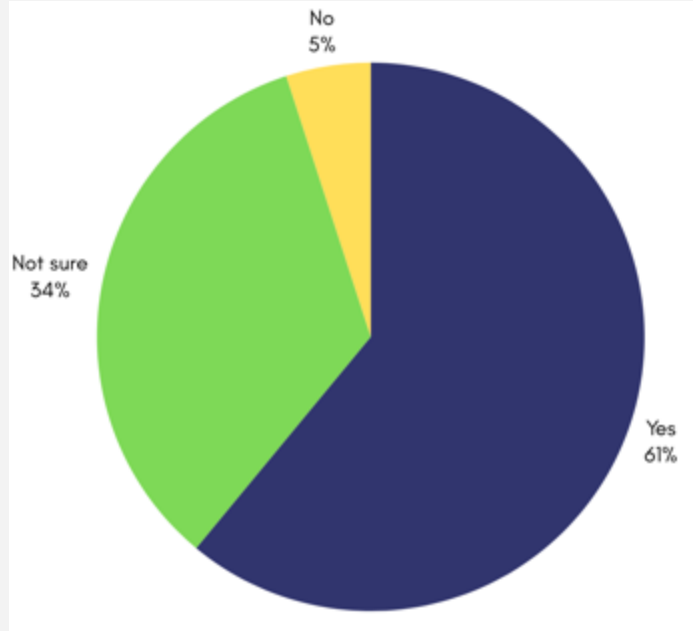


# Survey: Use of AI Platform

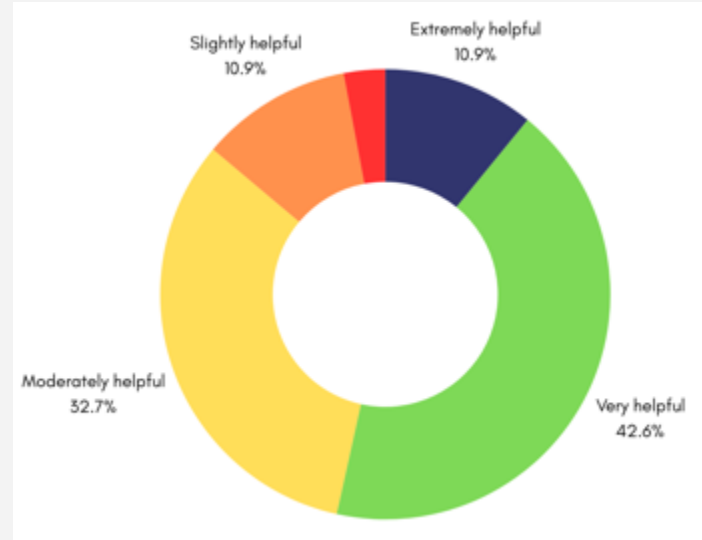


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Did the AI platform (EDUCO) help you identify and understand your mistakes in solving mathematics problems?



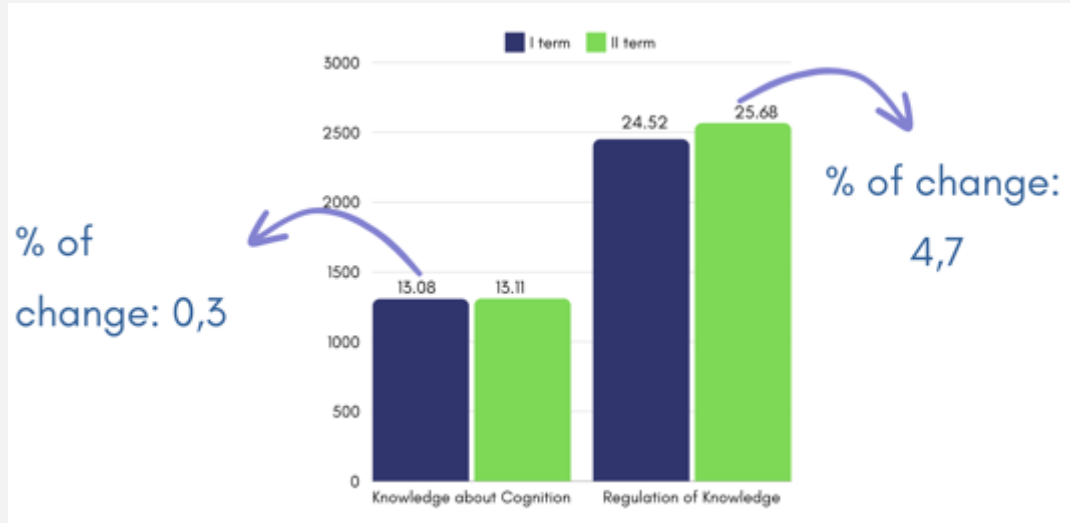
How helpful was the step-by-step guidance provided by the AI platform (EDUCO) in understanding how to solve the problems?



86% of the students found the step-by-step guidance helpful



# Survey: Metacognitive Awareness Inventory (MAI)



This difference is considered to be not statistically significant

# Survey: Metacognitive Awareness Inventory (MAI)



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## KNOWLEDGE ABOUT COGNITION

Procedural Knowledge



33%

Conditional Knowledge



24%



## REGULATION OF COGNITION

Planning



50%

Comprehension Monitoring



58%

Evaluation



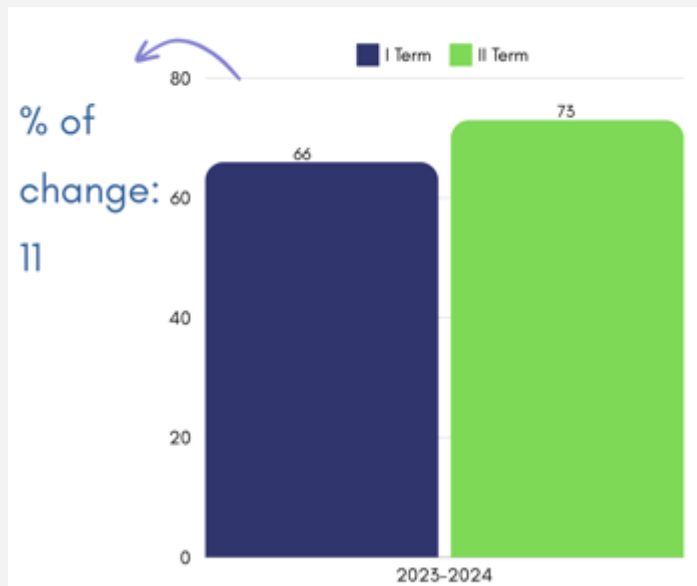
56%

# 2023–2024 Tenth–Grades: Comparative Analysis

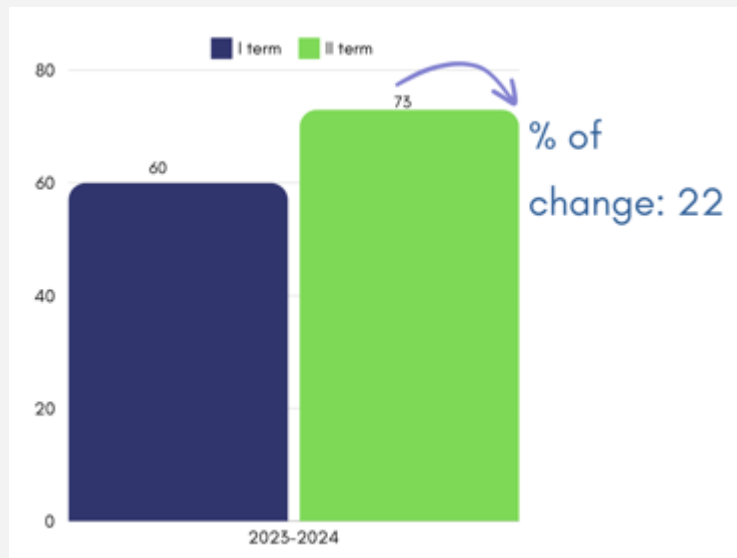


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Skills in logical reasoning and challenge solving



Average



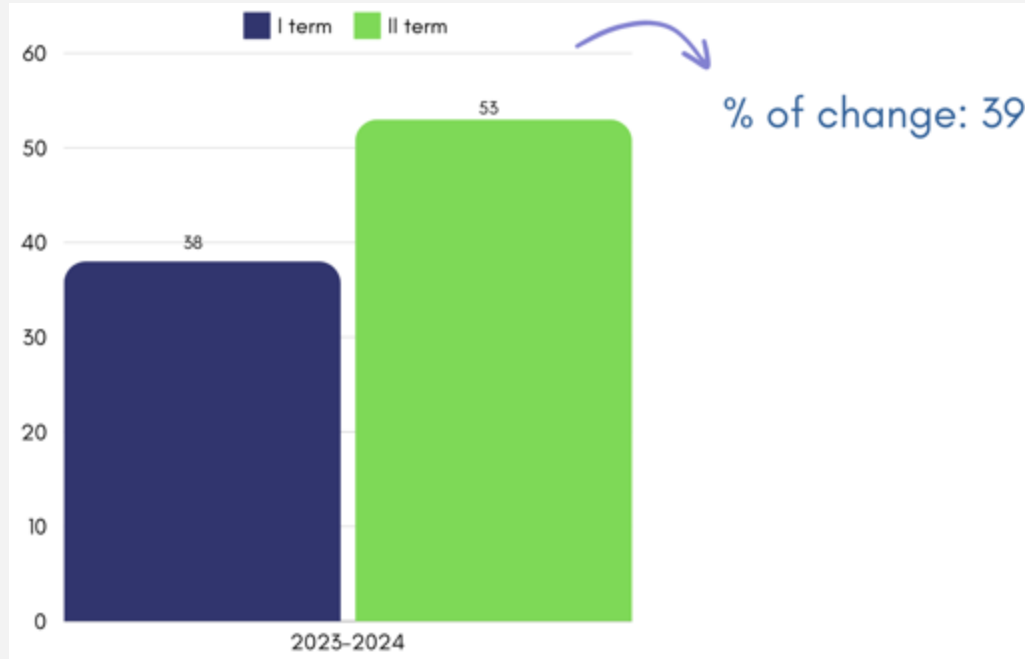
% of Approval

# Comparative Analysis

Exam



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% of Approval



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# Jorge Hernández Cao

Math Teacher 10th Grade





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# Mariana Serrano González

10C Student



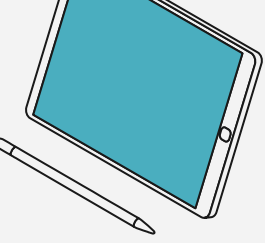




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# CONCLUSIONS





# Conclusions

## 01

Incorporating AI platforms boosts student performance and understanding in subjects like mathematics.

## 03

The findings of this study open up new opportunities for further investigations: to implement AI technologies in other areas of the school curriculum.

## 02

AI- Assisted Learning not only aids in content comprehension but also improves critical thinking skills, with notable progress in cognitive regulation skills.

## 04

Students underscore the importance of ongoing teacher training and the development of pedagogical strategies that effectively integrate these technologies to maximise their impact on learning and teaching.



# Thank you!

**Do you have any questions?**

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**[www.sgs.edu.co](http://www.sgs.edu.co)**

