Impact on Secondary School Students' Self-Regulated Learning: A Longitudinal Study within the WAY Project

Uaiana Prates (Laboratory of Distance Education and eLearning – UAb)
Eva Morais (University of Trás-os-Montes and Alto Douro – UTAD)
Ana Mouraz (Laboratory of Distance Education and eLearning – UAb)

ECER - EUROPEAN CONFERENCE ON EDUCATIONAL RESEARCH

Agenda

- WAY Project
  - Self-Regulated Learning
  - Methodology
  - Peer Observation
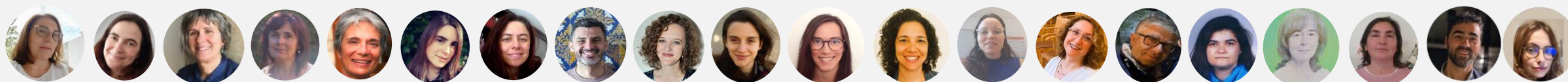- Goals
- Methodology
- Results
- Final Considerations

WAY Project
Who sAw You then, who sees you now!

Promoting student self-regulated learning in the classroom through peer observation.

FCT/2022.01025.PTDC/2023-2026

WAY Project
Who sAw You then, who sees you now!

Self-Regulated Learning

- "Self-regulated learning (SRL) is a core conceptual framework to understand the **cognitive**, **motivational**, and **emotional** aspects of learning." (Panadero, 2017, p. 1)

- "Learning is viewed as an activity that students do for themselves in a **proactive way** rather than as a covert event that happens to them in reaction to teaching." (Zimmerman, 2002, p. 65).
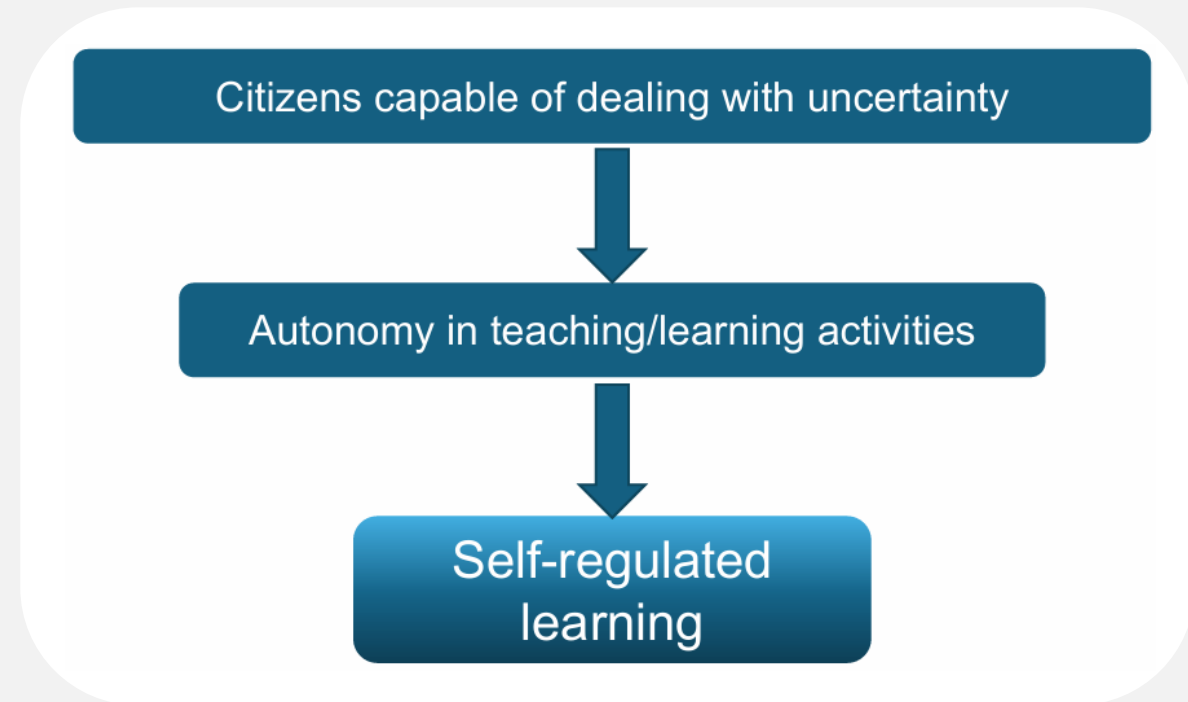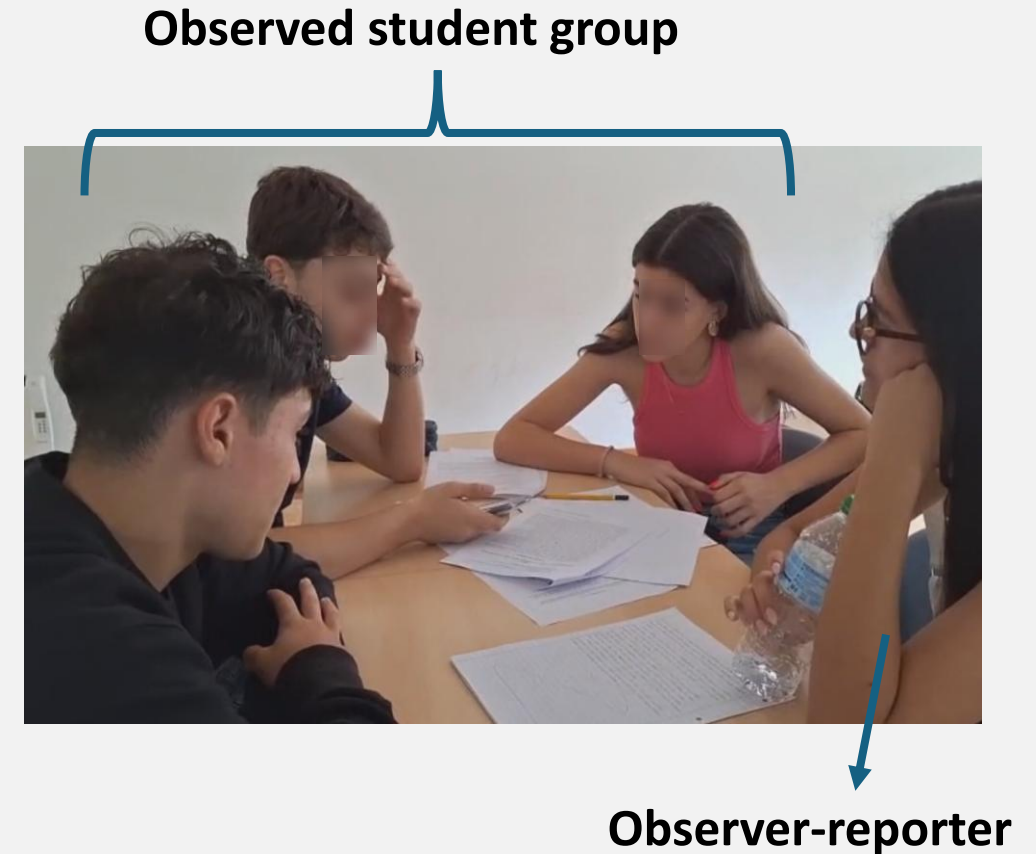
WAY Project
Who sAw You then, who sees you now!
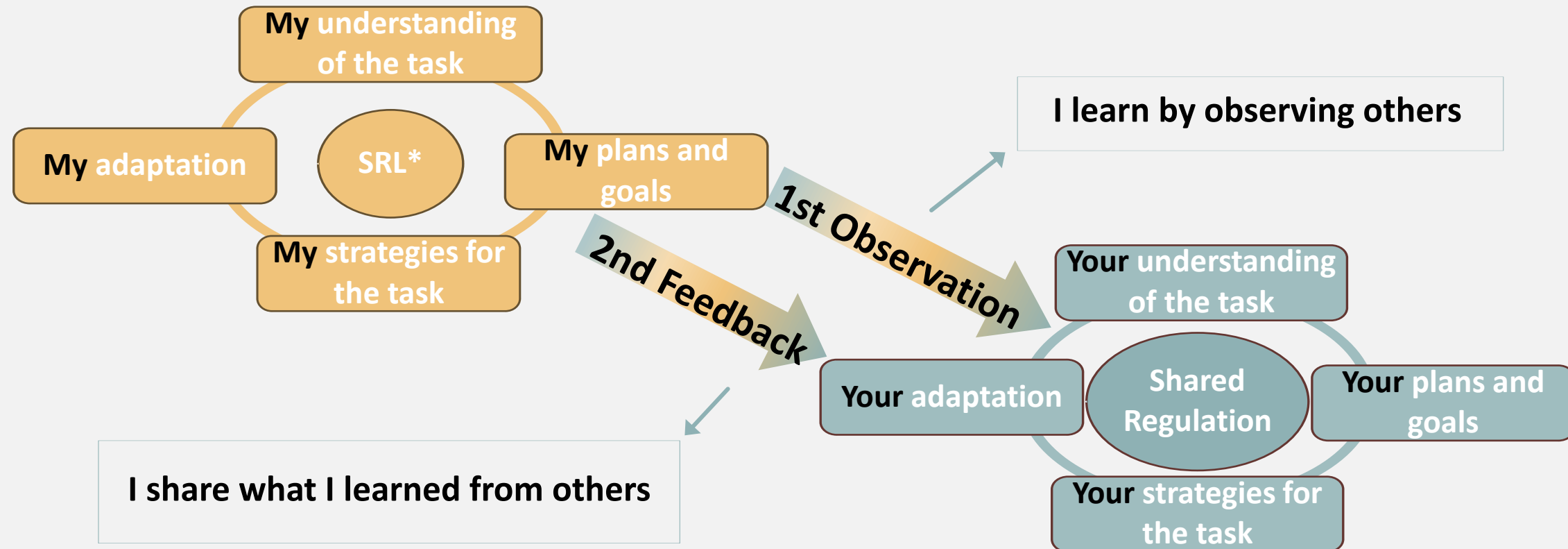
Peer Observation

- **Observation** and **Feedback** from students in a **group work context** during a **learning task**.

- Process observation will be conducted, followed by feedback on what was observed, considering the **self-regulated learning process**.

Observed student group

Observer-reporter

WAY Project
Who sAw You then, who sees you now!

Peer Observation

My **understanding of the task**

SRL*

My **adaptation**

My **plans and goals**

My **strategies for the task**

1st Observation

2nd Feedback

I learn by observing others

I share what I learned from others

Your **understanding of the task**

Shared Regulation

Your **adaptation**

Your **plans and goals**

Your **strategies for the task**

* SRL = SELF-REGULATED LEARNING

WAY Project
Who sAw You then, who sees you now!

Project's Methodology

- Design Based Research (DBR)

- Longitudinal study: Three years' Project (2023, 2024, 2025).

- Mixed Methods Approach: Qualitative (focus groups, feedback scripts) + Quantitative (Motivated Strategies for Learning Questionnaire - MSLQ).

- Four school clusters involved in the entire process

A Longitudinal Study within the WAY Project

Main Goal: to evaluate the impact of the three-year WAY Project, implemented in Portuguese schools, on students' SRL using a quantitative self-reported measure (MSLQ) composed of 15 dimensions.

MSLQ: Motivated Strategies for Learning Questionnaire (Pintrich, 1991)

frontiers | Frontiers in Education

Validation and proposal of a short version of the Motivated Strategies for Learning Questionnaire (MSLQ) for Portuguese adolescent students

Eva Morais[1,2†]   Anabela Caetano Santos[3,4*†]   Ana Mouraz[3,5†]

Short version: 56 items (2025)

Cronbach's alpha = 0.956

Research Hypotheses

H1: students who observe their peers' performance of tasks in the classroom and later provide feedback will acquire more **cognitive and metacognitive strategies**;
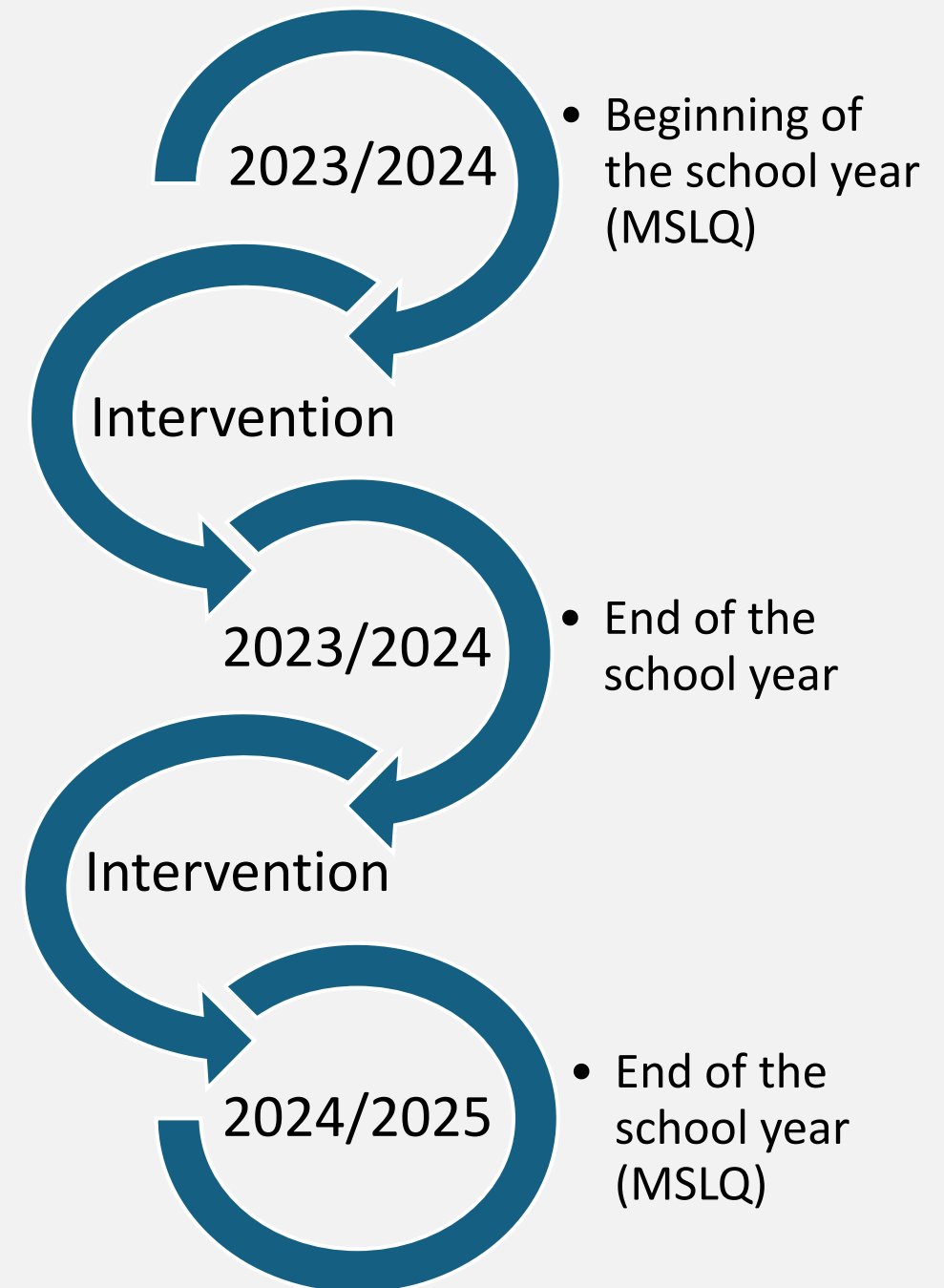
H2: students who observe their peers' performance of tasks in the classroom and later provide feedback will acquire more **resource management strategies**;

H3: They also acquire more higher **levels of motivation** compared to their peers in the control group.
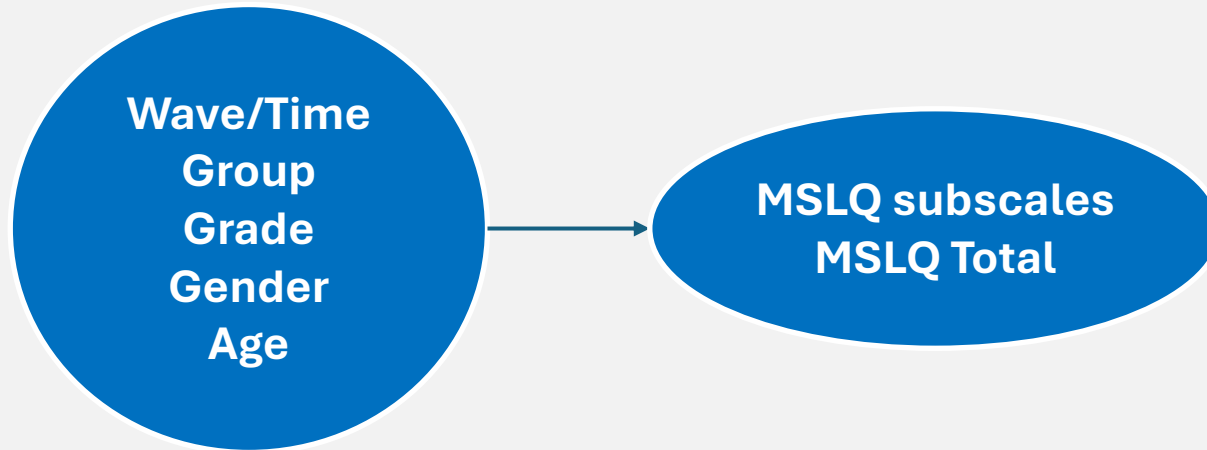
Methodology

- The study involves an experimental group of 478 students who participated in pre- and post-intervention assessments.

- The MSLQ was administered to this group of 478 students in the experimental group (EG) and 331 students in the control group (CG).

- Statistical Method: Linear mixed model (LMM)

Group		
	Frequency	Percent
Control	331	40.9
Intervention	478	59.1
Total	**809**	100.0

2023/2024
- Beginning of the school year (MSLQ)

Intervention

2023/2024
- End of the school year

Intervention

2024/2025
- End of the school year (MSLQ)

Longitudinal analysis: Linear Mixed Model (LMM)

Wave/Time
Group
Grade
Gender
Age

→

MSLQ subscales
MSLQ Total

The model used **Type III fixed-effects** sums of squares to test the significance of each predictor, controlling for the others.

Fixed Categories
- Wave/Time
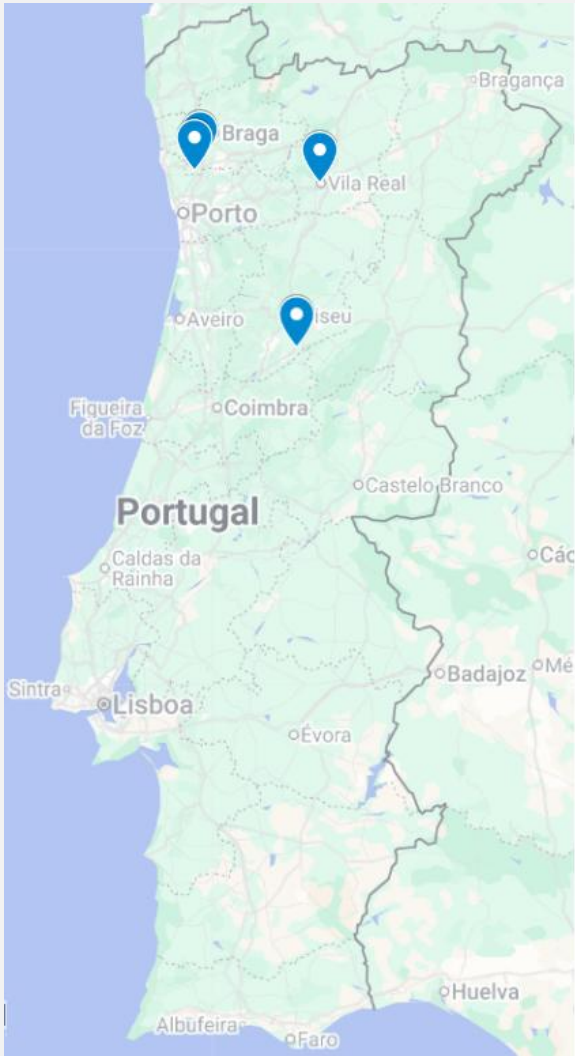- Group
- Grade
- Gender

Continuous Covariate
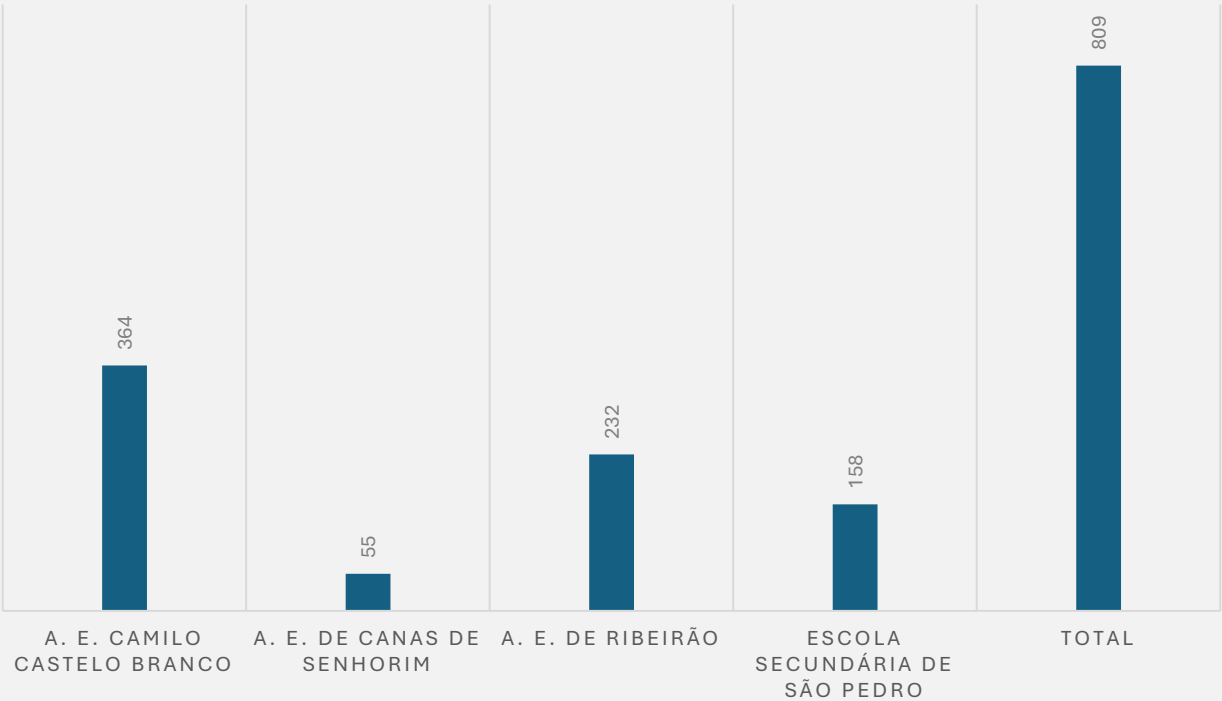- Age

The LMM accounts for:
- ✓ The correlation within individuals across repeated measures;
- ✓ The longitudinal nature of the data;
- ✓ The appropriate handling of missing data;
- ✓ The estimation of the adjusted effects of the independent variables.

Students Characteristics (N=809)

410 (50.7%) students identified as male, 375 (46.4%) as female, while the remainder (24) either did not answer or selected the option "I prefer not to answer" (2.3%).


SCHOOL FREQUENCY

A. E. CAMILO CASTELO BRANCO	364
A. E. DE CANAS DE SENHORIM	55
A. E. DE RIBEIRÃO	232
ESCOLA SECUNDÁRIA DE SÃO PEDRO	158
TOTAL	809

Students Characteristics (N=809)

- **Group**: Control and intervention groups are equivalent at baseline T1 for the three subscales and for the MSLQ total.
- **Gender**: Male and female students are not equivalent at baseline T1 for any of the three subscales nor for the MSLQ total.
- **Cohort**: when entering the study, students of both cohorts (Year 1 and Year 2, at times T1 and T3, respectively) are equivalent for the three subscales and for the MSLQ total.

Group: Baseline Analysis (Wave T1)
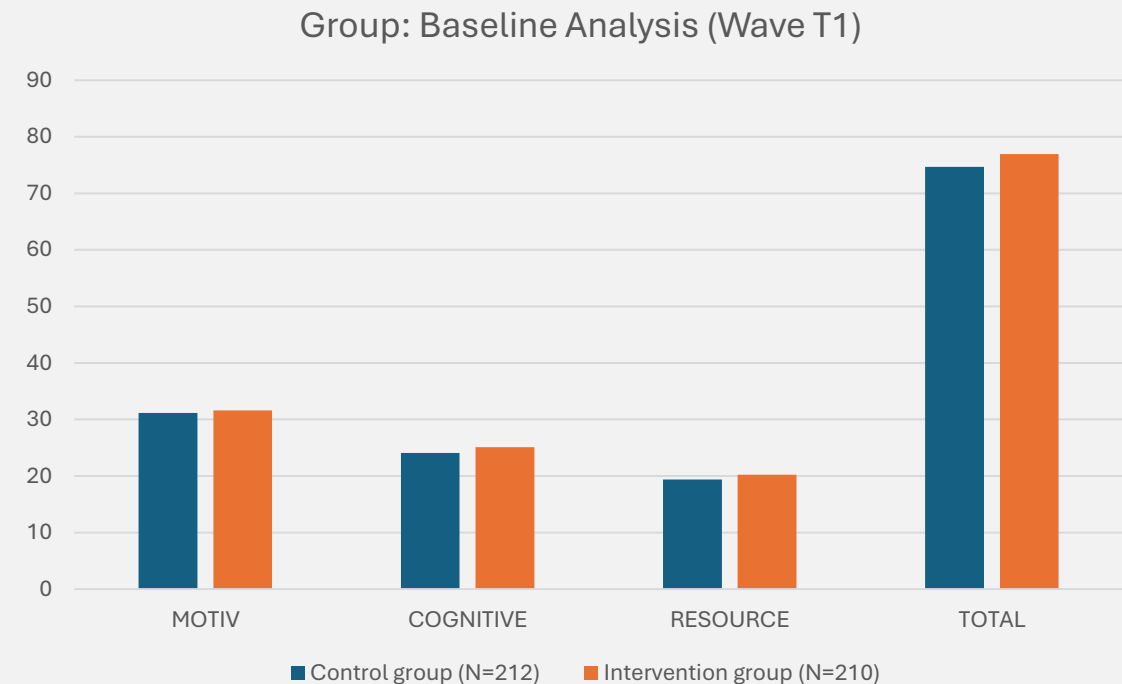
Results – Cognitive and Metacognitive Learning Strategies (CMLS)

- The results point to significant effects of the **Group**, **Grade**, **Gender** and **Age** on **CMLS**.

Type III Tests of Fixed Effects on CMLS				
Source	Numerator df	Denominator df	F	Sig.
Wave	3	594.793	.822	.482
Group	1	1119.125	11.363	**.001**
Grade	3	711.792	4.032	**.007**
Gender	2	1117.859	10.104	**.000**
Age	1	1149.291	7.181	**.007**

✓ **Group**: Significant, with the **intervention group with higher mean score in this scale**.
Grade: Significant effect, indicating that **the average CMLS score in the 11th grade is significantly higher than in the 10th grade**.
Gender: Highly significant effect, showing CMLS varies by gender**. Female students have a statistically significant higher mean CMLS score than male students**.

Results - Resource Management Learning Strategies (RMLS)

- The results point to significant effects of the **Group**, **Grade**, **Gender** and **Age** on **RMLS**.

Type III Tests of Fixed Effects on RMLS				
Source	Numerator df	Denominator df	F	Sig.
Wave	3	617.189	2.234	.083
Group	1	1147.746	7.951	**.005**
Grade	3	693.980	7.268	**.000**
Gender	2	1079.619	8.049	**.000**
Age	1	1118.973	15.471	**.000**

✓ **Group**: Significant, **with the intervention group with higher mean score** in this scale.

Grade: Highly significant effect, indicating that **the average RMLS score in the 11th grade is significantly higher than in the 10th grade.**

Gender: Highly significant effect, showing RMLS varies by gender. **Female students have a statistically significant higher mean RMLS score than male students.**

Results – Motivation Scale

- The results point to significant effects of the Grade, Gender and Age on Motivation, while other predictors such as the Wave and the Group show weaker or no evidence of impact in this model.

| Type III Tests of Fixed Effects on Motivation				
Source	Numerator df	Denominator df	F	Sig.
Wave	3	580.517	2.303	.076
Group	1	1137.488	.864	.353
Grade	3	710.071	4.057	**.007**
Gender	2	1097.749	5.937	**.003**
Age	1	1125.440	14.701	**.000**

Group: **Not significant**, implying **no evidence that motivation differs between the control and the intervention groups**.

Grade: Significant Effect, **indicating that the average motivation score in the 11th grade is significantly higher than in the 10th grade**.

Gender: Significant effect, showing motivation varies by gender. **Female students have a statistically significant higher mean motivation score than male students**.

Final Considerations

- **H1**: students who observe their peers' performance of tasks in the classroom and later provide feedback will acquire more **cognitive and metacognitive strategies.**

- **H2**: students who observe their peers' performance of tasks in the classroom and later provide feedback will acquire more **resource management strategies.**

- **H3**: They also acquire more higher **levels of motivation** compared to their peers in the control group.

"**Collaborative interaction** allows students to share strategies, discuss problem-solving approaches, and collectively reflect on their learning practices, which **can strengthen SRL by encouraging metacognition, autonomy, and responsibility in the learning process**." (Torres et al., 2024)
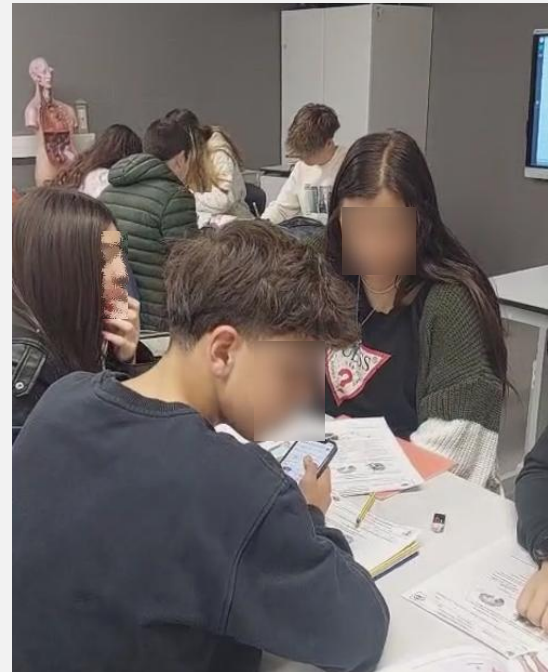
References

- Morais, E., Santos, A. C. & Mouraz, A. (2025). Translation, validation and proposal of a short version of the Motivated Strategies for Learning Questionnaire (MSLQ) for adolescent students in Portuguese schools. Front. Educ. Volume 10 – 2025. doi: 10.3389/feduc.2025.1445548

- Nobre, A., Mallmann, E., Mazzardo, M., & Martin-Fernandes, I., (2017) Princípios teórico-metodológico de design based research (DBR) na pesquisa educacional tematizada por Recursos Educacionais Abertos (REA). Revista SanGregorio, ISSN 2228-7907

- Panadero E. (2017). A Review of Self-regulated Learning: Six Models and Four Directions for Research. Front. Psychol. 8:422. doi: 10.3389/fpsyg.2017.00422

- Pintrich, P. R., Smith, D. A. F., Garcia, T., & Mckeachie, W. J. (1993). Reliability and Predictive Validity of the Motivated Strategies for Learning Questionnaire (Mslq). Educational and Psychological Measurement, 53(3), 801–813. https://doi.org/10.1177/0013164493053003024

- Tuckman, B. W., & Harper, B. E. (2012). Conducting educational research (6th ed.). Rowman & Littlefield Publishers.

- Torres, A. C., Duarte, M., Pinto, D., & Mouraz, A. (2024). Self-regulated learning in secondary school: Students' self-feedback in a peer observation programme. Studies in Educational Evaluation, 83, 101407. https://doi.org/10.1016/j.stueduc.2024.101407

- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice, 41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

Thank you!

uaiana.prates@uab.pt
uaiana@gmail.com

https://lead.uab.pt/way-en/