Developing self-leadership in the context of primary school statistics in a bilingual school in Brazil

Camtree iSP International Schools Partnership

RESEARCH REPORT

Developing self-leadership in the context of primary school statistics in a bilingual school in Brazil.

Mariana Fernandes, Cibele Duarte, Patricia Torres
Aubrick School, São Paulo, Brazil

Abstract

Context: This research was conducted at Aubrick School in São Paulo, Brazil, which provides bilingual education. It was part of the ISP-Camtree Life Competencies Research Project aimed at fostering essential skills such as empathy, effective communication, critical thinking, and teamwork. The study focused on how Year 2 students perceive factors impacting their learning in the context of statistics, specifically through graph interpretation.

Aims: The aim was to shift students' misconceptions about the use of graphs, which they initially thought were only for election results, towards understanding graphs as tools for data interpretation. In addition, the research sought to cultivate self-leadership skills among students through adapted lesson plans emphasizing interactive learning and open discussion of their educational experiences.

Methods: Teachers collaboratively planned and delivered a series of lessons focused on interpreting various datasets through graphs related to their school environment. Students worked in groups to analyze the data and articulate their understanding. Data was collected through observations and interviews regarding the learning process.

Findings: The implementation revealed that students gradually expanded their understanding of graph interpretation and reflected on their learning experiences. They actively engaged in discussions concerning the internal and external factors affecting their educational journeys. Despite some difficulties articulating their ideas about them, some students exhibited a capacity for reflection that surpassed initial teacher expectations.

Implications: This study highlights the potential for students to engage deeply with their learning when provided with structured opportunities for discussion and reflection. The model encouraged active participation and deeper cognitive engagement, suggesting that fostering an inclusive environment where students feel empowered to share their thoughts can enhance learning outcomes. Future similar projects may benefit from continued emphasis on vocabulary development and self-evaluation in fostering student autonomy in learning.

Keywords: primary mathematics education, graph interpretation, bilingual education, self-leadership, collaborative learning

This report was produced as part of the ISP-Camtree Partnership Project, 2024. This collaborative project involved teachers at ISP schools undertaking research lesson study to explore how to develop, demonstrate and assess life competencies.

Context

This study took place at Aubrick School in São Paulo, Brazil, which offers bilingual education. The study was part of the ISP-Camtree Life Competencies Research Project to implement life skills such as empathy, effective communication, critical thinking and the ability to work as a team.

For the Life Competencies Research Project, teachers worked together to plan three maths lessons about graphs and how to use good strategies to interpret data. We decided to investigate how children who are in Year 2 (8 years old) perceived the factors that impact their learning. The twenty mixed-ability students were divided into groups of 5 children each and had to interpret data in different graphs that presented information about the school: number of classrooms, number of staff, number of boys and girls in each Year 2 group.

Aims of the Lesson Study

Assessing their previous knowledge on the topic, it was found that students had the misconception that graphs would be used only to represent the results of an election, so the goal was to make them understand that they are used to interpret data. We changed the way we usually plan a lesson to add strategies that we thought would benefit the development of the target life competency: self-leadeship. The teacher would plan each lesson and then we would discuss how to adapt the teaching strategies to highlight the teaching of the life competencies.

There were previously defined learning objectives for maths and for self-leadership. However, when the lessons were delivered, we noticed a lack of vocabulary to describe student learning and assumptions that thinking about their learning would involve assessing behavior. So we decided to provide a repertoire to allow talk about learning and what could be the factors that impact it. In the list we provided, there was a checklist with factors such as feeling confident, feeling comfortable, having the completed material, being responsible, getting support from classmates and teacher, being in a classroom that is silent. They could also add factors if they wanted to.

The teacher also planned the lessons to focus on modelling language, so the students could develop the vocabulary they knew to talk about their learning. There would be moments of pause when students will have to use the right words to express their feelings about their learning and to think about the factors that are affecting it. Learning about statistics requires the ability to analyse and interpret data. This will potentially develop students' ability to see things from different perspectives and to communicate their points of view.

Research Question

Our research question was "**How can we help students in Year 2 to develop Self-Leadership in the context of Statistics?**"

Ethical Considerations and Relationships

The lesson study took place within the scope of normal lessons and as such normal school policies and procedures were observed. Other than informal interviews and survey data which were collected and used in classroom contexts, no additional data were collected. The students, including the case students, have been anonymised for the purpose of this report, although the school and staff involved are identifiable.

Predictions for the Class

N = Not Achieve, A = Achieve, E = Exceed

	Curriculum/Subject knowledge			Life Competency (Self-Leadership)		
Level	N	A	E	N	A	E
Predictions	3	5	12	3	5	12

See Appendix 1 for the full table.

Case Students

Case Student A (E) is a child with a calm temperament, organised and has harmonious relationships with friends and teachers. She participates in classes with enthusiasm, verbalising her knowledge, maintaining focus and attention on what is being explained. She understands collective commands, seeking to carry out tasks according to what was requested. It presents vocabulary and pedagogical performance expected for the age group.

Case Student B (J) is a communicative child, he always has something new to tell us, even if it is not related to the topic of the class. Therefore, we have to intervene so that the student gets organised and maintains focus on what is being taught. He verbalises his hypotheses and opinions with ease and appropriate vocabulary. He interacts with everyone in the group, however, in some situations, we have to revisit with J. some rules and arrangements established in our assembly moments. It is challenging for him to understand, read and interpret different textual genres, requiring individual support and retraining from teachers. J. has been diagnosed with Central Auditory Processing Disorder and has been seeing a speech therapist.

Case Student C (T) is a loving and kind child with everyone around him, he is always willing to help his friends and teachers. He respects the rules and agreements in different moments of daily school life. He is always attentive to class and actively participates in class, whether reading an excerpt from a text or carrying out a collective explanation. He appreciates the moments of story and creative drawings. So far he has good academic and social performance.

Research Lesson 1

Students will learn to conduct an investigation to answer non-statistical and statistical questions (categorical and discrete data). Teacher expects them to understand that all the graphs analysed by the students represent categorical data (not only results of votes).

Strategies

- Share with students the learning objective for this class.

- Teacher divides the students in groups with 4 students in each. Each group will get a graph that presents different types of discrete data - number of boys and girls in the classroom; number of desks in each Y2 classroom, number of workers in each school area - IT, Reception, Safety, Faculty; number of classrooms in each floor of the building; number of students in each afterschool activity.
- Next, we will provide an opportunity for students to reflect on the type of information the graph presents. They will have to answer the following questions:
  - What can you find out by looking at the graph? (we expect students to tell the teacher what the graph is about)
  - How do you know that? (we expect the students to tell the teacher which elements support their findings - captions, numbers, title of the graph)
  - What can we use this information for? (we expect them to make predictions such as we can use the data to know how many teacher's desks the school must have if we decide to have 1 teacher desk in each classroom).
- Review:
  - What did you learn? Did you learn anything new?
  - Did you have any challenges?
  - Was learning positive or negative for you? Why?
- Collect what students say to assess the kind of language they use to talk about learning.

Outcomes and Success Criteria

The goal is that each student understands that graphs represent data and are not only useful to register results of elections. This will be shown by their discussions in group and their answer to the questions the teacher will ask them.

Life Competency Outcome: To be able to work in a group and share ideas about the interpretation of the graph.

Curriculum Learning Outcome: To be able to verbalise that graphs are not only used for elections, but also to organise data.

RL1 Planning, Predictions and Observations

Stage of the Lesson	Case Student A Prediction	Case Student A Evidenced Response	Case Student B Prediction	Case Student B Evidenced Response	Case Student C Prediction	Case Student C Evidenced Response
Stage 1 (5') Description Teacher will explain to the students about the research study and divide them in 5 groups of 4 students each. Each Case Student will be allocated in a different group and will be asked to be the one responsible for taking notes for the group.	Case student A is going to be curious about the activity and happy to participate.	She asked questions about how the research would be done and if it would be done in all the Y2 groups.	Case student B will be in class, but won't show much curiosity about the research lesson.	While the teacher was explaining the student was looking around and complained about a paper cut on his finger.	Case student C will listen to what is said and will be happy to work in a group.	Case student C was looking at the teacher.
Stage 2 (10') Description Each group will receive a graph to observe.	Case student A will lead her group as she is well articulated and likes to lead.	As soon as the student received the graph, she started looking close at it, reading the captions.	Case Student B will wait for someone in his group to take a lead.	The student asked another friend to be responsible for registering.	Case Student C will focus on the task.	The student was proud to be chosen to register and got the sheet of paper and pencil to begin.
Stage 3 (15') Description Students will answer to 3 questions after observing the graph: ● What can you find out by observing this graph? ● How did you learn it? ● Think of how the data you find in the graph may be used in daily situations.	Case student A will be able to answer the 3 questions.	Case student A found it difficult to interpret the data presented in the graph. She needed support from the teacher to answer the questions and to understand the information that was presented.	Case student B will need help to answer the 3 questions.	He was able to express his ideas to the group and asked a few questions. When the bar was in the middle of two reference numbers shown in the caption, he asked what that would mean and, after the teacher used a ruler to show that it would represent a number in between, he demonstrated he understood by saying the correct number.	Case student C will need help to answer the 3 questions.	He discussed with his friends about the information presented in the graph. When a friend mentioned that the graphs present results of votation, he disagreed and explained that the graph did not show preferences, but the quantity of classrooms in each school floor.
Final Stage (10') Description Students will self assess their learning by answering to the questions: ● What did you learn today? Did you learn anything new? ● Did you face any challenge? ● Will what you learn help you to learn other things?	Case student A will be able to reflect on her learning and communicate her ideas.	The student needed help to express her ideas. She wrote short answers.	Case student B will need support to reflect on his learning and to register his ideas.	The student expressed his ideas in a way that is not clear if you just read his answers. But when he explains in his own words, they make sense.	Case student C will need support to register his ideas.	The student was aware that the challenges he faced were not related to the Maths content, but to language (writing in Portuguese). He mentioned that while doing the activity he learned a few words and how to spell them with his friends.

Interviews with Case Students

What did you enjoy most about the lesson?

- Case Student A: "I like the graph, I like to write on my own and to try to guess how many people there are at school with the help of J. and T. (students from her group)." [the graph given to this group showed the number of people work at school in each area (safety, health, admin, faculty)]
- Case Student B: "What I liked most was to do the activities with my friends. It was good to have help from C. and M. They helped me a lot."
- Case Student C: "I felt special to be the one to write. It felt good"

What did you learn?

- Case Student A: "I learned to see the graph of people who work at Aubrick and to write on my own. Now I can make better graphs and I can read and write faster."
- Case Student B: "I did not know that part when the teacher traced." (referring to finding out which was the amount represented). "Now I already know how to do it." "My friends helped me. There was this individual part that was more challenging. I need help. It's easier when there is silence. This is why I usually take the tests in a separate room."
- Case Student C: "I got better at writing. My friends helped me with spelling and telling me how to write."

What aspect of the teaching worked best for you?

- Case Student A: "When the teacher said a few things, asked us questions, this helped us. The teacher helped us to read the words and how to spell a few words. It was a challenge to write on my own."
- Case Student B: "The teacher drew a trace to help and gave us hints. We asked for help because I was lost (referring to the individual self assessment"
- Case Student C: "The teacher was asking questions to other students that helped me to understand what the activity was about." (referring to the conversations he heard between other groups and the teacher)

If the same lesson is being taught to another group what would you change? Why would you change that aspect?

- Case Student A: "No"
- Case Student B: "I would bring other graphs, how many people have cats and dogs." "There could be a rotation with different activities, counting, patterns, graphs."
- Case Student C: "No"

Reflections on Research Lesson 1

Case student A surprised us as the prediction was that she would excel, and she needed support. In relation to Life Competency Outcome: The student was aware of what was challenging to her (being responsible for writing) and verbalised it clearly. She does not write clearly about the factors that impact her learning as writing a text is challenging for her. In relation to Curriculum/ Subject Learning Outcome, the graph that was assigned to this group was a bit more difficult to interpret (bigger quantities).

The predictions we made for *Case student B* matched the outcomes. In relation to Life Competency Outcome, the student was aware of the factors (internal and external) that impacted his learning. He knows he learns best when the room is not noisy and that his friends' help benefit his learning. In relation to Curriculum/ Subject Learning Outcome the student was able to understand the data that was presented in the graph and learned how to read the bars and relate them to the captions.

Although the predictions we made for *Case Student C* matched the evidences of learning, he was much more active that we predicted leading his group. In relation to Life Competency Outcome,the student realised that listening to the teacher talking to other kids had an impact on his learning. He was really proud of being the one to write and needed some mediation to think about what was challenging (spelling in Portuguese). In relation to Curriculum/ Subject Learning Outcome, he excelled, as he not only understood the data that was presented, but also explained it to a classmate who did not.

Adjustments

The type of questions (about their learning) surprised the students as they are not used to being asked about their learning. It was the first time they analysed a graph that was not built by the classroom. Maybe they had this idea that graphs are only used to register choices (elections) because this was the only use the teacher modelled previously. Next time the teacher teaches about graphs, she has to make sure they have access to a variety of types and data. They took longer than we expected to accomplish all the tasks. Maybe next time Lesson 1 should be divided into 2 lessons.

Research Lesson 2

Students will:

- Interpret data, identifying similarities and variations, within data sets, to answer nonstatistical and statistical questions and discuss conclusions (3Ss.03)
- Talk about the learning and communicate the aspects of the learning to the peers.
- We expect the students to be able to focus on communication - to talk about their learning, challenges and findings while working in a group. We also expect them to ask questions to each other so they can further explore the interpretation possibilities, sharing their knowledge and skills.

Strategies

- Each student will write a prompt card that will be used to present their findings about the graph. Each group will present the graph to the classmates and take questions. :

Outcomes and Success Criteria

Life Competency Outcome: To be able to talk about the learning, explaining to the whole class what they found out by interpreting data in the graph.

Curriculum Learning Outcome: To be able to explain information in a graph and suggest how one can use that information.

RL2 Planning, Predictions and Observations

Stage of the Lesson	Case Student A Prediction	Case Student A Evidenced Response	Case Student B Prediction	Case Student B Evidenced Response	Case Student C Prediction	Case Student C Evidenced Response
Stage 1 (10') Description Students will be asked to recall their findings from the lesson and write prompt cards to present their findings to their classmates. All the students must share their findings, challenges and strategies they used to accomplish their task.	She will be happy to write as she has highlighted how she enjoys being responsible for it.	She read her line. The teacher had to mediate the conversation among the students to help them to explain what the graph was about and how they interpreted the data. Then It was easier for the student to explain her interpretation, rather than to just read one line. While explaining, she pointed to the graph to show where she found the information.	He will need help to focus and to stay on the task. The teacher will have to explain the task more than once and keep him engaged.	In the beginning he was distracted and needed support to be in front of the group to present. He was constantly moving his body while his classmate presented. He was also reading his prompt card instead of paying attention to his classmate. He was the last one to present in his group.	Student C tends to talk only when the teacher requests. He will do his task and take questions, but won't talk much.	He read what he wrote about graphs in his prompt card. He told his classmates he would teach them how to make a graph and said they had to write the title and numbers to any amount. .
Stage 2 (10')Description Students will present their findings using the projector to show the graphs to their classmates.	She is communicative and will be able to talk about the work of her group.	It was still a challenge to read the labels of the graph (People who work at school) and to relate the quantities to the people they know and that the students are acquainted with.	He will talk a lot, but sometimes will talk about topics that are not related to the activity.	When it was his turn, he did not read the prompt card but explained what he could do with the information presented in the graph. He mentioned it was useful to know how many students were absent on a school day. He was focused on the use of the graph to calculate.	The student will present his work according to the task.	When he finished, the teacher asked questions. She asked him what the purpose of the numbers were. Then he explained that the graph was about the amount of classrooms in each school floor.
Final Stage (10')Description Students will answer their classmates' questions.	She will take questions attentively and answer them.	When students asked the group questions, she did not take the lead to answer. She helped her group, but was not responsible for answering them. There was one question that her group did not understand and she was able to clarify, rephrasing it.	He will take questions and try to answer most of them, even if he does not know the answer.	When he was watching another presentation, he asked a question about a word that he did not understand. When he explained what it was, it was clear that he did not listen to it, showing a difficulty that is a characteristic of his disorder (Central Auditory Processing Disorder).	The student will answer questions only if the teacher asks him to. Otherwise he will count on his classmates to answer them.	When the classmates asked other questions, student C was around, but did not answer them. The teacher asked if he wanted to say something else to his classmates and he said he did not. He was distracted while the other students from his group were taking the questions from the classmates

Interviews with Case Students

What did you enjoy most about the lesson?

- Case Student A: "I like to be the one who is responsible for writing. The teacher said we could write about how we look at the graph and talk about what we see."
- Case Student B said, "I enjoyed that everyone was asking me questions that I did not know, but that now I do. The interviewer asked what was asked that made him learn. He mentioned that the students asked questions based on the information presented in the graph, such as, asking him to tell how many students were at school if 2 were absent (he referred to the possibility of solving problems using the data presented in the graph).
- Case Student C: "Student did not know what to mention.

What did you learn?

- Case Student A: Considering the presentation to the whole class, the student mentions it was the first time she was doing this type of presentation. Then, she mentioned another school presentation they are preparing (School Open House) and said, "I know when you present you can't make jokes or show a playful posture, you need to try to help your classmates so they learn and make questions as well". She said, "I learned about how many people are part of the cleaning staff, which I did not know".
- Case Student B: "The student mentioned how he was able to subtract better. What he meant was that by looking at the data it was easy to understand how many students were absent at school, something that was considered to be important information about the graph by his group".
- Case Student C had an extended talk about their learning:
    - Student: "I have already done presentations in Year 1. It can be a little bit nervous if you forget what you are talking about.
    - Interviewer: "What did you have in your hands not to forget?"
    - Student: "We used this paper that we had to write something that we learned about the graphic and on that day, my friend, who was in the group, didn't come so I could say her line."
    - Interviewer: "And how did it feel? Was it unexpected?"
    - Student: "I was happy because I could say two lines."
    - Interviewer: "Is there anything you learned about the way you presented? How to communicate, how to use your body?"
    - Student: "I think no, because I can't remember."
    - Interviewer: "If you had to give advice to a friend that is doing a presentation, what would you say?"
    - Student: "Don't be nervous and try to… the line you are going to speak, you have to say it a lot of times so you can remember it, and don't try to look like super cool (making fun and pretentious); I don't need to look my paper, I remember in my head…"
    - Interviewer: "So the student is not supposed to do that?"
    - Student: "If you want to look cool and not look at your paper, you can do that, but you need to say your line a lot of times."

What aspect of the teaching worked best for you?

- Case Student A: She mentioned that the teacher instructed her to pay attention to what she was doing to present it better.

- Case Student B had an extended talk with the interviewer:
  - Student: “Everything my teacher did help me to learn. She taught me to make origami.”
  - Interviewer: “And what did she do in the lesson that helped you learn and to present about the graphs? Do you think you got any better? Was it your first time presenting? How did you feel?”
  - Student: “I was happy. This was not my first presentation and I always feel the same, embarrassed.”
  - Interviewer: “Did the teacher do anything that helped you to overcome this challenge?”
  - Student: “I don’t know.”
  - Interviewer: “If you had to give some advice to a friend about how to present well, what would you say?”
  - Student: “You focus on what you have to say.”
- Case Student C:
  - Interviewer: “Did your teacher do anything that helped you in your presentation?”
  - Student: “I think no”.

If the same lesson is being taught to another group what would you change? Why would you change that aspect?

- Case Student A: “No”
- Case Student B:.”No”
- Case Student C: “No”

Reflections on Research Lesson 2

Case Student A: Progress was noticed as the student was able to communicate what she found out by answering the teacher’s questions. We noticed that during the interview it was not easy for the student to think about her learning. The questions the interviewer asked seemed unexpected, which made us infer that she is not used to thinking about her learning often. In relation to Curriculum/ Subject Learning Outcome, the goal of talking about the interpretation of the data was achieved by the student.

When *Case Student B* had to think about his presentation, he mentioned he was embarrassed and that this is an emotion that he always feels in these situations. Nevertheless, he seemed distracted, moving his feet and even leaving the front of the classroom twice, requiring the teacher's support to be back on his place. In relation to Curriculum/ Subject Learning Outcome, the student was not able to organise information to present. He was focused on explaining how the students could use the information to sum and subtract, considering the purpose of the graph would be to know how many students were absent at school on a specific day.

Case Student C is able to do more than he delivered. He talked when it was his turn, but was happy to take his classmate's part as she was absent on the day of the presentation. In relation to Curriculum/ Subject Learning Outcome, he was able to achieve the objective when working in his group, but when he had to talk about it, he simplified and only read his prompt card. The teacher had to ask questions for him to elaborate. There was a classmate in his group who was very talkative and she led the presentation, leaving less space for him to take a lead.

The teacher asked questions when she realised the group would not explain the graph, but would rather just read the prompt card. The lesson was long and students were visibly tired of watching all the presentations. It was a good strategy to ask them to talk about the graph as it gave the teacher the opportunity to assess their progress and gave the students an opportunity to look at the graph again from a different perspective, talking about it to a larger group.

Adjustments

It would be best if the presentations were distributed in two different days as it would keep them focused.

Next time the teacher could give students success criteria for them to assess their peers' presentations, giving feedback on how clear it was and how the resources they used helped understanding.

For student B, she decided to use strategies to keep him focused on the task as he would easily get distracted. The teacher would remind him of what was expected from him while presenting, such as being in front of the classroom with his peers.

Research Lesson 3

Students will

- Conduct an investigation to answer non-statistical and statistical questions (categorical and discrete data) (3Ss.01)
- Record, organise and represent categorical and discrete data. Choose and explain which representation to use in a given situation: Venn and Carroll diagrams, tally charts and frequency tables, pictograms and bar charts. (3Ss.02)
- Understanding internal and external factors affecting your learning.

Strategies

- Students will work in the same groups. They will receive a nonfiction text to read and discuss. Then, they will have to organise the graph that displays information read in the text and present it to their classmates.
- After that, they will make a self-evaluation (Appendix 2).

Outcomes and Success Criteria

By the end of the lesson, students should be able to organise the bars of the graphs according to the information they gathered by reading the text.

RL3 Planning, Predictions and Observations

Stage of the Lesson	Case Student A Prediction	Case Student A Evidenced Response	Case Student B Prediction	Case Student B Evidenced Response	Case Student C Prediction	Case Student C Evidenced Response
Stage 1 Description Students read the text given by the teacher. Each group will receive a different text.	She will read the information by herself.	She read silently. Her text was about the amount of vertebrate animals in Brazil and she needed help to recall what vertebrate animals are.	He will need help to read.	He did not read and asked his classmates to tell him about the text. His text was about the size of the area of deforestation in the Amazon region.	He will read and ask questions about vocabulary.	He read and asked the teacher to explain a few words. The graph was about the time each material takes to decompose. He did not understand the concept at first and the teacher had to clarify.
Stage 2 Description Students discuss the information presented by the text.	She will discuss it with her group.	It took time for the group to understand the information in the text. The vocabulary was challenging and they did not get the information without the teacher's explanation.	He will discuss it with his group, but will listen more and expect help from his peers.	It took time for the group to understand the information in the text. The vocabulary was challenging and they did not get the information without the teacher's explanation.	He will discuss it with his group.	It took time for the group to understand the information in the text. The vocabulary was challenging and they did not get the information without the teacher's explanation.
Stage 3 Description Students build the graph using materials the teacher gave them (bars and A3 sheet of paper).	She will look for the numbers in the text to put the bars in the correct place.	The information was not so clear in the text. She had to observe the A3 sheet of paper and infer how the bars should be arranged.	He will look for the numbers in the text to put the bars in the correct place.	The information was not so clear in the text. He had to observe the A3 sheet of paper and infer how the bars should be arranged.	He will look for the numbers in the text to put the bars in the correct place.	The information was not so clear in the text. He had to observe the A3 sheet of paper and infer how the bars should be arranged (the size of the bar could be told by the position of the drawing on the sheet of paper).
Stage 4 Description Students present their graph to the group.	She will present the information.	When the teacher asked to plan the presentation, she wanted to write a prompt card, but did not know what to write. The teacher told her it was not mandatory to write and that she could just explain what she did. During the presentation, she helped her classmate to read (one that does not read so fluently). The teacher had to ask questions to make her explain what she read in her own words.	He will present the information. It is expected that he loses focus and that the teacher needs to support him.	He read the text instead of telling his classmates what the text was about. He did not know a few words and his reading was not fluent.	He will present the information.	The group divided the lines and decided to present what they read in the text. The words were not familiar and he read without making sense of what was being read. The teacher had to support him and explain a few words. After that he seemed to understand what the text was about and said it in his own words. The teacher asked the group to look at the graph and identify the elements such as title, items and time of composting. When it was his turn he demonstrated he knows how to interpret data in a graph.

Interviews with Case Students

What did you enjoy most about the lesson?

- Case Student A: The student did not say anything specific, but that she enjoyed the activity.
- Case Student B:
    - Student: "Everything helped me to learn. What I liked most was the time when we had to tell the truth."
    - Interviewer: "But is there a time not to tell the truth? Is it time to tell the truth or time to think about the things that happen?"
    - Student: "Both. The part that I liked most was the one we had to say if we paid attention to the lesson. Did you understand what the teacher said?"
- Case Student C: His graph was about the time it takes for objects to compost. He liked the self-evaluation because it shows students how good they are.

What did you learn?

- Case Student A reflected in detail about her subject learning:
    - Student: "I learned how to use a graph, which I did not know before. How to make a graph…
    - Interviewer: "How did you know where you had to place each bar?"
    - Student: "There was a number. And if the number was bigger then we had to place the tallest bar. We decided by looking at the size of the bar."
    - Interviewer: "Was there anything that the teacher or a friend did that helped you to notice that?
    - Student: "No, I did it on my own."
    - Interviewer: "What did you write in your self-evaluation? How much did you learn?
    - Student: "I learned a lot. I did not know anything about graphs and now I know that to make a graph you, for example, count how many people there are in a place. If there are many children and only ten lollies, we will have to vote with a graph to check who wants them."
    - Interviewer: "But is the graph always used to register an election?"
    - Student: "No, it can be about counting something."
- Case Student B: The student said he learned to subtract. For example, there are 15 people in Y2C and 1 is absent. Then there will be 14. His graph was about the deforestation in the Amazon region and he learned that it is important to preserve the forest. He said the group decided to organise the graph by size. It was not from the smallest to the tallest. They knew because there was a mark on the paper that would tell the size of the bar. He admitted he did not read the text and that he got the information from his friends. He acknowledges that it was necessary to read because, he said, "if we do not read we don't know what we are supposed to do".
- Case Student C: To determine which bar should be glued on each place they had to see the fitting. The bar would always reach to the image of the object, according to the student. The student mentioned that, although he read the text, it was not necessary to read it to organise the graph. In his self-evaluation he mentioned he did not learn much. He explained that the

content was not new to him. He evaluates that he already knew everything that was taught and that the only thing he learned was that you can do maths problems with graphs.

What aspect of the teaching worked best for you?

- Case Student A:
  - Interviewer: "What did you choose as factors that helped you to learn?"
  - Student: "I do not remember all the items, but I learned a lot. I do not remember what I chose."
  - The interviewer recalls the options and then she remembers she thinks her friends' help was really important and that she likes to work in a group to get the support of her classmates to do things she does not know. She also mentions that her teacher helped her to calculate.
- Case Student B: He identifies the teacher as an important agent of support for him to learn. But he does not identify what she does that is helpful. He mentions teaching to calculate, to read.
- Case Student C: He understood that the teacher helped him a few times. When asked how he would make the lesson more challenging, he was not able to elaborate.

If the same lesson is being taught to another group what would you change? Why would you change that aspect?

- Case Student A: "No"
- Case Student B: "No"
- Case Student C: "No"

Reflections on Research Lesson 3

Case Student A was able to build the graph, although it was a challenge to interpret the data presented as the topic was too complex for her (vertebrate species in Brazil). It was surprising that she ticked a few items from the list of factors that helped her learn (as most of the students understood they had to check them all even if it was not an aspect that helped them). She added to the list that one factor that helped her was that the teacher liked it.

Case Student B has a strong sense of what is needed to learn and he identifies he learned a lot. He ticked all the items in the list of factors that help him learn and added that it is important to take good care of the material. The strategy was to model language so they can talk about their learning. It was noticed that even with the model, it was a challenge for the student to think about his learning and not learning in general.

Case Student C did not identify he learned a lot about graphs. He highlights as important factors for learning the explanation of the teacher, the support of his peers, being confident and responsible and prevent from talking to his classmates.

Adjustments

The students need to be asked more frequently to talk about their learning. They are used to knowing what contributes to learning, but do not identify how this would be visible in their personal growth. We should try to give them more time to discuss the factors that affect learning.

Evaluation at Class Level

This summary table shows the differences between teacher expectations and predictions at the beginning of the research lesson study sequence and the evaluation of actual achievement on the basis of evidence gathered during the study (see Appendix 3 for the full table).

N = Not Achieve, A = Achieve, E = Exceed

	Curriculum/Subject knowledge			Life Competency (Self-Leadership)		
Level	N	A	E	N	A	E
Predictions	3	5	12	3	5	12
Assessment	1	17	2	1	16	3
Difference	-2	+12	-10	-2	+11	-9

The structured methodology used to plan activities allowed us to reflect on our initial assessments and explore different strategies for assessing prior knowledge. Measuring students' abilities is not an easy task, especially since the learning objectives, both in Mathematics and Life Competencies, involved assessing not only the skills students already had but also those we aimed for them to develop.

Findings

Considering the prior knowledge presented at the beginning of the research, it is noticeable that the group expanded its vision and concepts related to the theme developed, since, faced with new challenges and questions, everyone reflected on the practice carried out, revisiting it through dialogue and records, building more elaborate knowledge in each lesson.

This showed the students the value of meaningful learning in an inclusive environment - where everyone has the opportunity to teach and learn, developing decision-making, responsibility and communication. Thinking about the near future, changes are necessary to empower students to think about their learning, favouring the development of the multiple competencies for the construction of knowledge where the different curricular components, interdisciplinarity, practical proposals and singularities of students are part of the planning of lessons.

Thinking of the life competencies goals in maths lessons was beneficial as the students were constantly asked to use their learning abilities to do the tasks.

We learned that students are more capable and powerful to reflect about their learning than we imagine, that they can go beyond the goals we set. The interviews that were done showed us that the students are able to talk about their learning, but often keep telling the teacher what they think it is expected from them. Expanding opportunities where everyone has the right to give their opinion, have their turn and have a voice during the dynamics of classes only enriches the act of teaching and learning, both for the students and the teacher.

It is important to keep asking them about their learning so they get more able to talk about it, using the proper vocabulary and understanding that they can talk about their personal learning, being honest about which factors support their pathway.

Teacher Reflections on the Research Process

Mariana Resende (Global Education Coordinator): The children responded well when we asked them about their learning, being always willing to answer questions. They felt special because we were asking for their feedback in order to improve learning at school in general. It was a challenge to them to identify and verbalize what the teacher did that had a positive impact on learning. And it was also difficult to suggest changes to the planning. They were always more comfortable and talkative when reflecting on how they felt.

If we could do the project again, we would start by organizing an assembly with the students to think about ways of talking about learning. We could make a chart that would be used by them and they could keep a record throughout the whole project. This would probably be challenging regarding time management, but it would give them the language they needed to reflect on their journey as learners and could be an important resource to be used as a thinking routine.

If we had to give some advice to a fellow teacher who is planning on doing something similar, I would recommend taking advantage of the discussions the team can have before delivering the lesson. They are good starting points for you to predict how students will react and what kind of impact to imagine the lessons will have on them. The questions the workbook provided by Camtree guided important conversations between teachers. The reflections we made together led to discussions about how to put the learner at the center as an active agent of learning and how the teacher can take a supportive role enabling students to discover what factors impact their learning as an individual instead of following what is expected to work for everyone.

Cibele Duarte (Class Teacher): It was an enriching and important experience to participate in this research, especially as a teacher in the process of self-reflection. What was important in the ‘before, during and after’ of this learning process was to make better pedagogical choices, try different techniques, with an organization that can guarantee the progress, the engagement of the students in the learning process.

How much this reflection did this have a positive impact on my work and the learning of the students? Thinking about the issue of numbers, when we talk about numbers, they often think of calculations: “Oh, I want to do math. Oh, it's addition, it's multiplication”. But they were able to see that numbers, in their social function, are more than calculations. Numbers are experiences, something that goes beyond the classroom: facts, statistics. So, working on this concept of information processing and data collection, they were able to expand this repertoire and realize how much research, how much their perspectives, opinions and investigations contribute to this process.

And from then on, they were able to realize that numbers are not just calculations or measurements, they also bring facts from society. So, for example, today when they look at a graph related to extinction, they can see that that statistic, that data, brings a contribution, a reflection. “Look, that animal was in extinction, now it is out of the margins, or is it still there? What can we do about this? For example, the issue of recyclable waste. How much waste do we produce? How much are we recycling?" So, how much has this learning favor the social side as well? From our actions, from our performance, as students, but as citizens as well.

There was also the issue of small groups, that they were able to work and integrate better and better, exchanging ideas, having this oral exchange, and knowing how to respect and listen to each other. So, the result, I wouldn't say it was final, because I believe they will carry this experience throughout their academic career.

Next Steps

Research Lesson Study was an effective tool to start our discussions and promote changes in the way lessons were planned. From lesson 1 to lesson 3 it is possible to see the change in the way reflection was planned. The conversations that the Research Lesson Study promoted among staff were focused on learning and how visible it can be when we make predictions and anticipate what learning will look like in each lesson.

The next steps would be to present the results to the faculty and align with the team how to model the language students use to talk about their learning to strengthen their ability to evaluate and communicate their progress, challenges and need of support in a way that is positive, engaging and personal, instead of a list of general expectations of what learning should look like.

The key messages to share will be the importance of being committed and aligned with the institution's philosophical and pedagogical perspective, which implies a series of new challenges. This presupposes a critical, ethical and reflective stance, that is, reflecting through all the learning process to look for evidence of impact. It also requires thinking about the coherence between theory and practice, during the teaching-learning process, in view of the learning of knowledge, skills and understanding as central at school.

Sharing the process of making predictions, observing lessons and discussing students' learning is also important as it is a useful strategy for teachers to reflect on their teaching practice and how to make more impact on students' learning regarding knowledge, skills and understanding.

Supplementary materials/resources

Self-evaluation tool (Appendix 1)

About the International Schools Partnership

ISP was founded in 2013 and has schools are located in Europe, North America, Latin America, Middle East, India and South East Asia. ISP's unique approach to learning recognises its students as collaborators in the learning process. The Group focuses on developing the knowledge, languages and lifelong competences that help them thrive beyond their time at school. ISP students benefit from teaching excellence, international opportunities, and careers guidance. The Group's school have access to a global network of experts and teachers and leaders are supported to continuously improve through extensive professional development programmes.

About Camtree

Camtree: the Cambridge Teacher Research Exchange is a global platform for close-to-practice research in education. Based at Hughes Hall, University of Cambridge, Camtree draws on high-quality research from around the world to support educators to reflect on their practice and carry out inquiries to improve learning in their own classrooms and organisations. The outcomes of these inquiries, once peer reviewed, can be published within the Camtree digital library under a Creative Commons Licence (CC-BY 4.0). You can find out more about Camtree and its digital library at www.camtree.org.

Appendix 1: Initial Predictions for the Class

N = Not Achieve, A = Achieve, E = Exceed *Case Student

Student First Name and/or Initials	Curriculum/Subject knowledge prediction			Life Competency prediction		
	N	A	E	N	A	E
AM	x			x		
AT		x			x	
AR			x			x
CA			x			x
DI		x			x	
EDA *			x			x
EDO			x			x
FÁ			x			x
FE		x			x	
GU		x			x	
JP		x			x	
JO *	x			x		
JÚ	x			x		
LA			x			x
LO			x			x
LU			x			x
MC			x			x
ML			x			x
TH *			x			x
VI			x			x

Appendix 2: Self-Evaluation

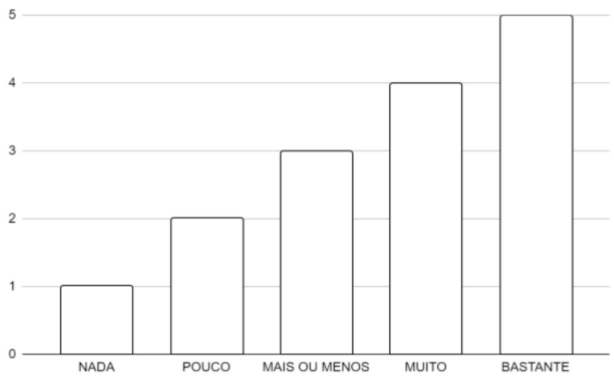
Aubrick

NOME:______________________________ DATA: __/ ___/ 2024

1. HOJE VOCÊ APRENDEU A ORGANIZAR UM GRÁFICO. VAMOS PENSAR SOBRE O QUE APRENDEMOS?

PINTE AS BARRAS DO GRÁFICO PARA MOSTRAR O QUANTO VOCÊ APRENDEU.

APRENDI A FAZER GRÁFICOS E A RESOLVER PROBLEMAS:



O QUE TE AJUDOU A APRENDER? FAÇA UM X NAS ALTERNATIVAS QUE VOCÊ CONSIDERA IMPORTANTES PARA A SUA APRENDIZAGEM NESTA AULA.

	A PROFESSORA EXPLICOU A ATIVIDADE.
	A SALA DE AULA ESTAVA SILENCIOSA.
	MEUS COLEGAS ME AJUDARAM A FAZER A ATIVIDADE.
	O MEU MATERIAL ESTAVA COMPLETO.
	EU ESTAVA CONFORTÁVEL.
	EU ESTAVA CONFIANTE.
	EU FUI RESPONSÁVEL AO FAZER A ATIVIDADE.

CAMBRIDGE International Education
Cambridge International School

iSP International Schools Partnership

Appendix 3: Post-Lesson Study Assessments for the Class

N = Not Achieve, A = Achieve, E = Exceed

Student First Name and/or Initials	Curriculum/Subject Knowledge outcome			Life Competency Development outcome		
	N	A	E	N	A	E
AM		x			x	
AT		x			x	
AR		x			x	
CA		x			x	
DI		x			x	
EDA *		x			x	
EDO			x			x
FÁ		x			x	
FE		x				x
GU		x			x	
JP		x			x	
JO *		x			x	
JÚ	x			x		
LA		x			x	
LO		x			x	
LU			x			x
MC		x			x	
ML		x			x	
TH *		x			x	
VI		x			x	