



## **The Art of Science Learning**

### **WP4 Assessment Analysis of Goal 3**

#### **French Case Study**

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**July 2017**



European  
Commission

Horizon 2020  
European Union funding  
for Research & Innovation

*This project has received funding from the European's Union H2020  
research and innovation program under grant agreement N° 665826*

## FRENCH CASE STUDY

### GOAL 3: TRANSVERSAL SKILLS

#### General Framework of the Analysis

As a way to explore how the workshops approached GOAL 3 (i.e., promoting the acquisition of transversal skills amongst students), we specifically focused on three different types of transversal competences: i) learning to learn skills, ii) civic and social skills, iii) sense of initiative and entrepreneurship. More specifically, our analysis has been oriented towards exploring to which extent PERFORM workshops have facilitated learning spaces to train and put in practice students' transversal competences, and what aspects facilitated or hindered such practice. Therefore, **our aim is to characterize the process according to its capacity to foster transversal competences, and not to assess students' individual transversal competences.**

**Learning to learn skills** refer to students' ability to pursue and organize their own learning in accordance with their needs, and to the awareness of learning methods and opportunities. They include: understanding the value of learning, as students' awareness of their learning process; learning autonomy, as students' ability to pursue and persist in science learning (e.g. organising their learning, effective management of time and information, both individually and in groups); and reflective thinking, as the ability to gain, process and assimilate new scientific learning and related life experiences through reasoned thinking and/or discussion, in order to use and apply them in a variety of contexts.

**Civic and Social competences** generally refer to those personal, interpersonal and intercultural skills and forms of behaviour that equip individuals to participate in an effective and constructive way in social and working life. Among them, we have identified two broad groups: i) collaborative skills, referring to behaviours that help two or more students work together in the science learning process, including respect for others' opinions and the ability to approach conflict within the group in a constructive manner; and ii) communication skills, associated to students' ability to communicate ideas effectively by using verbal, visual and written tools as well as body language.

**Sense of initiative and entrepreneurship** globally refer to the ability to turn ideas into action. This cluster of skills includes students' leadership, their sense of responsibility towards and ownership of the outcomes, their ability to plan and manage projects in order to achieve objectives, and their creativity and innovation. From an emotional dimension, we also included students' self-confidence and esteem, approached as students' perceived capability to effectively accomplish a certain level of performance in science learning.

## Methodological Approach

These three groups of transversal competences **have been explored through** students' inputs provided in the surveys (as a first quantitative approach) and researchers observations of the workshops complemented by students, teachers and ECRs inputs (as a qualitative in-depth approach).

### Students' inputs:

We first explored **students' self-perceptions in relation to such transversal competences** through **a questionnaire conducted twice**: 1) **before the realization of the workshops** (Pre-PERSEIA survey) and 2) **after the workshops** (Post-PERSEIA survey). In order to evaluate whether students' answers were specific to the PERFORM group, we also conducted these questionnaires (pre- and post-PERSEIA) among a group of students who did not attend to the workshops: the control group. In total, the **PERFORM group was composed by 40 students** (19 students in Vauréal and in 21 students Marie Curie) and the **control group by 48 students** (31 students in Vauréal and 17 in Marie Curie).

We analyzed students' answers for both questionnaires (Pre- and Post PERSEIA) independently by looking at **the percentage of answers reported by students**. We then compared answers from PERFORM group with answers from the Control Group. For PERFORM students, we also analyzed whether there were differences between boys and girls, and between groups of students (as students were divided into two groups in each school). Finally, in order to see **whether students' answers changed between the pre and the post surveys, we calculated the variation for every individual answers for each question**. As most of the questions were answered with a scale of agreement (from 1: totally disagree with the statement to 7: totally agree with it, and 4: neutral), variation was calculated as follows: "Post Survey Answer – Pre Survey Answer". In that sense, a negative individual variation indicates that students' degree of agreement lower after the performance of the workshops. Similarly, a positive variation indicates that students agreed more with the statement after the development of the workshops. We analyzed then, whether such variations differed between boys and girls, between groups and between the PERFORM group and the control group. To explore whether the differences between PERFORM vs Control group, PERFORM groups, and sexes were statistically significant, we ran Wilcoxon Ranking Tests and ordinal logistic regressions.

We also explored **students' perceptions towards the workshops in relation to transversal competences**. In this case, since we were not comparing pre and post-survey answers, we included the whole PERFORM group (n=42 students<sup>1</sup>). We analyzed whether there was any statistically significant difference either between groups of PERFORM students, or between boys and girls, by running Wilcoxon Ranking tests.

For the sake of clarity, **only statistically significant differences have been reported in this document**<sup>2</sup>. It also implies that specific highlights are present only when the variation of PERFORM students' answers did not follow the same pattern as the control groups.

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<sup>1</sup> One student in each school did fill only one questionnaire

<sup>2</sup> This means that if no specific interpretation related to group or to sex of the students is included in the text, the trends described were not different according either to the group or the sex of the students.

## Researchers' observations of the workshops

We then analyzed researchers' observations of the workshops in order to **explore in-depth the pedagogical context and learning approach** and **to which extent and how it fostered the *mise-en-place* of skills and competences implied in the creation of the PERSEIAs**. Most of the results presented in this document rely on the observation of Group 1, which was observed all along the process (the 7 workshops, the final rehearsals and the final PERSEIA), supported also by the observations of Group 2, which was observed in three alternative sessions (PW1, PW4 and PW7).

## Students, teachers and ECR inputs

All these results **have been complemented with further students' inputs**, collected through: i) a **focus group** with a reduced but representative group of students who participated in the project (9 students in Marie Curie and 10 in Vauréal); and ii) students' answers to a learning chart they filled at the beginning and the end of the project (PW3 and PW6).

Finally, to complete our analysis, we analyzed **teachers'** and **ECR's** perceptions about the fostering of students' transversal skills through the process gathered through **oral interviews** (2 teachers in Marie Curie and 4 in Vauréal) **and written interviews** (2 ECR from each school).

Further details on the data used for each of the three specific transversal competences are described in their respective section.

## Specific Methodological Approaches

**Learning to learn skills** were first approached in the survey by exploring students' perceptions of the value of science and their perceived capacity to formulate research questions, a key aspect of doing research that was emphasised during the workshops. Researchers' observations during the workshops focused mostly on aspects related to reflective thinking and learning autonomy, such as: their capacity to ask questions, reason and argue, their ability to reframe scientific concepts and develop ideas, their capacity to assess or reflect about their peers' performance and their ability to autonomously organise their time during the sessions to do the tasks. Students' focus group approached several transversal competences and the learning charts provided during the workshops were devised to foster students' reflection about their learning process through the PERSEIA creation, and students' answers about i) their motivation to learn, ii) what they have learnt and ii) how they have learnt it, have been analysed to identify insights related to learning to learn skills.

**Students' social and civic competences** were approached in the post-PERSEIA survey through three items exploring students' perceptions of: i) their active participation in the workshops, ii) the sharing of tasks within their groups, and iii) the inclusion of their ideas in the PERSEIA. During the workshops, collaborative skills were approached by observing the following aspects: i) students' sharing of tasks and roles during the activity, ii) students' willingness to ask for help and to help others, iii) students' respect towards

others' ideas and iv) students' ability to manage difficulties within the group (if any). Communication skills were approached by observing: i) students' ability to elaborate and share ideas verbally and written and ii) students' use of the body to express ideas and convey meanings. Students' focus group approached social and civic competences by further exploring their perceptions on work organisation, students' participation and decision-making within the groups.

**Students sense of initiative and entrepreneurship** were assessed through two items related to: i) students' feelings of self-confidence along the workshops, and ii) students feeling prepared for performing. Thus, survey items focus on students' self-perceptions related to the emotional dimension, while we expand our focus through the other data collection tools. Researchers' observations approached students' sense of initiative and entrepreneurship by focusing on students' behaviors during the workshops and whether they suggested initiative and ownership of the process. Most specifically, we observed the following aspects: i) students' leadership and/or responsibility over the group activity and final outcomes, and ii) students' affective responses related to self-confidence and personal initiative. Some aspects observed in the sections above also complement these observations (e.g., students' ability to resolve conflicts, students' autonomy). Students' focus group approached sense of initiative by further exploring their perceptions on their individual involvement and their participation and role in group work oriented towards creating the PERSEIA.

**Common to the three sets of transversal competences, teachers' interviews** included a question on their perceptions about the impact of the project on students and their evolution through the workshops, including transversal competences in general. Similarly, there was not any specific question related to these sets of transversal competences in the **ECR interviews**, but we looked for emerging related data.

### **Specific Note for the Reader**

This document presents the results of the workshops conducted in both schools involved in the PERFORM project in France. As the facilitation of the workshops has been partly led by the same facilitators in both schools, most of the context of facilitation has been similar in both schools. In that sense, although this document aimed to also highlight the differences that have emerged from the different schools, most of the contextualization allowing the *mise en place* of the transversal skills were similar. In that sense, some repetitions occur in this manuscript between both schools.

## Overall highlights

### *Learning to Learn*

- ❖ **Students' perception towards the value of learning science did not seem to change** after the project.
- ❖ **The way facilitators led the workshops**, by establishing a horizontal relation with the students and creating a climate of trust and a playful **atmosphere allowed students to freely share and develop their ideas and reflections**.
- ❖ Despite of this, the science **learning process did not seem to reach its potential**, mostly due to a **lack of connection between the reflection activities** in the first part of the workshops and **the PERSEIA creation process through the research on students' topics**. Such lack of connection induced a confusion about the aim of the reflection activities hindering the capacity of the process to foster students' learning to learn skills.
- ❖ Due to the reduced amount of time devoted to students' reflection on their own research question (both within and outside the workshops), **students could not really develop a reflective thinking on their topics and on their own process of learning science**.
- ❖ In contrast, thanks to the time dedicated to train students in theatrical skills and the constructive approach transmitted to students, they could **rely on their previous knowledge, their creativity and assess their own process of learning performing art**.

### *Social and Civic competences*

- ❖ Students' **collaborative skills have been fostered and students' communication skills have been largely reinforced**, thanks to the development of the different theatrical **exercises** all along the workshops.
- ❖ Except few exceptions, **all the students reported having highly participated into the project**, and having **shared work with their peers**.
- ❖ All along the workshops, students showed a **general respectful and helpful relation with each other**, and **no major difficulties** among themselves were observed.
- ❖ **Collaborative work was fostered** among students thanks to several dynamics: students' improvisations, development of the PERSEIA and -to a lower extent- the reflection process on students' research questions.

### *Sense of Initiative*

- ❖ **Neither clear leadership** among students **nor clear students' ability to manage and plan a project** was observed while doing the workshops and for the creation of the PERSEIA, mainly **due to the fact that most activities and theatrical developments were directed by the facilitators**.
- ❖ The use of **theatrical improvisations** as a way to raise students' ideas for the elaboration of the PERSEIA **allowed students to develop a sense of initiative and creativity**.
- ❖ **Students' self-confidence has been largely reinforced** and fostered through their participation in the different workshops.

## Recommendations

- In order to **better foster students' ability to value science**, to learn how to learn, and develop reflective thinking, **more time and space should be devoted to the process of research among students (both related to the questions and topics developed during the workshops)**.
- In that sense, in order to better foster both the learning autonomy and awareness of students' learning process, **more space should be given to reflection activities that explore students' questions, all along the different workshops**. Based on students' research question, learning science abilities such as reframing scientific concepts would be largely more fostered.
- In order to foster students' self-organization and autonomy, a **more balanced way between time guided by the facilitators vs students' self-organization should be considered during the workshops**. For instance, the final PERSEIA could be more **co-developed with students**, by **giving them more responsibilities** towards the creation of the script of the PERSEIA, **fostering students' ability to manage projects**.
- As enhanced **collaborative and communication skills** appeared **as students' main learning outcomes** from the project, **exercises related to body awareness and acting** should be maintained as a **key stone of the workshops**.
- A **special attention to students' needs, questions and doubts** during the whole process **should be maintained**, as it **highly contributed to students' engagement into the project and students' improvement of self-confidence**.

## Collège Les Toupets - Vauréal

The PERFORM Project took place in the school “*Les Toupets*” in Vauréal from January to March. Workshops were led by **two facilitators: one science communicator and one performing arts professional**. Both worked together in a collaborative way, by sharing the management of the workshops and supporting each other’s tasks.

It involved a total of 20 students (9 boys and 11 girls) divided in two subgroups of 10 students each. Although all were involved in the final PERSEIA, only 19 students answered to both pre and post-PERSEIA questionnaires.

### Highlights

#### *Learning to Learn*

- ❖ Students **did not change their perceptions towards the importance of learning science for their future**. However, the **proportion of students who considered themselves as able to formulate research question** tended to **increase after the workshops**.
- ❖ Overall, we could see that **students actively asked questions and shared ideas** between themselves and with the **facilitators**. **This fluent communication** has been certainly partly due to the **horizontal relation** and **climate of trust** the facilitators established since the beginning of the workshops.
- ❖ Students’ **reasoning and argumentation** mostly occurred when **students were sharing their ideas verbally** (during the dialogues and debates), as students seemed less comfortable when they have to use written support.
- ❖ Due to the reduced amount of time devoted to students’ reflection on their own research question (both within and out of the workshops), **students could not really develop a reflective thinking** on their topics and on their own process of learning science.
- ❖ **Differences existed between groups** regarding student’s appropriation of the topics and ability to develop their ideas, probably due to their learning abilities.
- ❖ **Contexts in which students' ability to appropriate and reframe scientific concepts could not be developed deeply during the workshops**. It occurred during some activities and when thinking on their research question, but it was overall quite reduced and students did not go really far in their own exploration of the scientific topics they chose.
- ❖ **Students' assessment towards peers' performance mostly occurred in a benevolent and constructive way**. It has been allowed, at least partly, by the guidance the facilitators provided to the students.
- ❖ **Students reflective thinking on their learning was limited**, as most of them could not really explain either what or how they have learnt during the project about their own research question. In contrast, thanks to the time dedicated to training students to performing art and the constructive approach transmitted to students, they could **rely on their previous knowledge, their creativity and assess their own process of learning performing art**.



## ***Social and Civic competences***

- ❖ **Students' collaborative skills have been fostered thanks to different dynamics** that took place all along the workshops, including the improvisations in groups and the preparation of the sketches for the final PERSEIA.
- ❖ **Students' communication skills** have been **largely reinforced, thanks to the development of the different theatrical exercises** all along the workshops.
- ❖ Except few exceptions **all the students reported having highly participated into the project**, and having **shared work with their peers**, aspect of the project students really appreciated.
- ❖ All along the workshops, students showed a **general relation of respect and help with the others**, and **no major difficulties** among themselves were observed.
- ❖ All along the workshops, the different activities **fostered students' body awareness, and the use of the body to express emotions and ideas**.
- ❖ Similarly, **students have been largely trained to express orally**, thanks to the different exercises proposed by the facilitators.

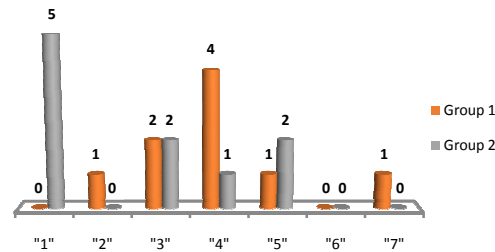
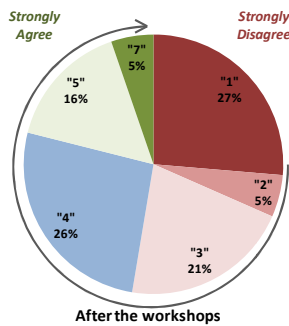
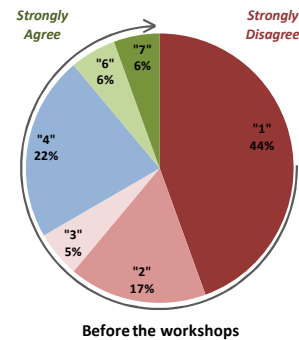
## ***Sense of Initiative***

- ❖ **Students' self-confidence has been largely fostered** during the project, thanks to the **theatrical exercises** and the **attentive and benevolent facilitation** provided during the workshops.
- ❖ **Neither clear leadership** among students **nor clear students' ability to manage and plan a project** was observed while doing the workshops and for the creation of the PERSEIA, mainly **due to the fact that students could not have the space to self-organize their own work**.
- ❖ The use of **theatrical improvisations** as a way to raise students' ideas for the elaboration of the PERSEIA **allowed students to develop a sense of initiative and creativity**

## LEARNING TO LEARN SKILLS

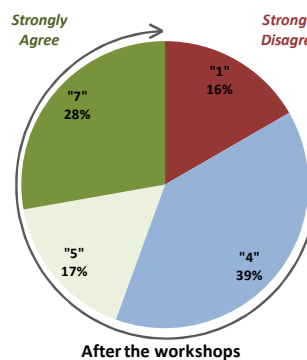
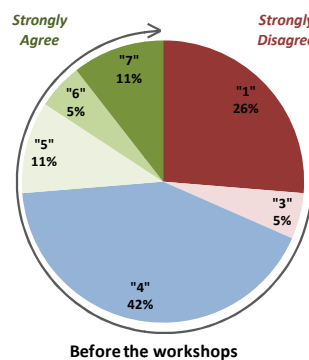
Before the workshops, **66%** of the students **disagreed** that *"learning science is not important for my future success"*, and 4 provided neutral answers.

After the workshops, the proportion of students who disagreed with the statement decreased, but such differences are not significant at the statistical level. However, students' answers to the post survey largely **differed from one group to the other**, as 70% of the students from Group 2 provided negative answers (vs 33% of students from Group 1) while students from Group 1 gave much more neutral answers (45% of the students, vs 10% in Group 2).



### *"Learning science is not important for my future success"*

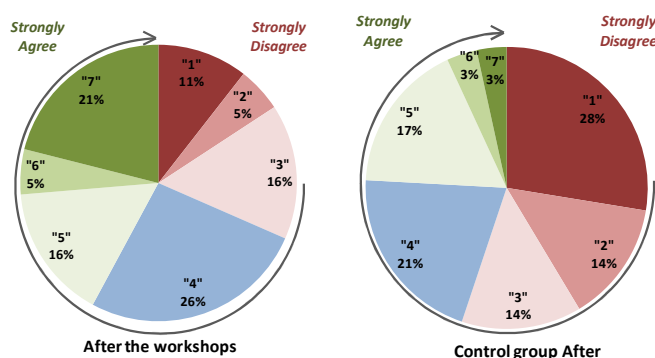
When asking students whether *"What [they] learn in science class will help [them] to get a job"*, their answers did not follow a clear pattern, but 42% of them provided a neutral answer.



### *"What I learn in science class will help [them] to get a job"*

After the workshops, although variation between both surveys did not change significantly, we could see that there was a **higher proportion of positive answers** (from 27% to 45% of the students) and a decrease of negative answers. However, the proportion of neutral answer was still high during the post survey (39% or 7 students).

Before the workshops, 36% of the students reported they were "**able to formulate research questions**". After the workshops, although most students tended not to change their opinion (average variation=0.59), we could see that the **proportion of positive answers increased** (42% in the post survey). The **results from the post survey differ from the ones gathered among the control group**, as only 23% of the students from the control group considered they were able to formulate research question.



**"I am able to formulate research questions"**

Although answers from the questionnaires did not allow us to say that the project could have impacted students' perceptions on science learning, in the following part we explore **how the context and protocols developed during the workshops helped students put into practice different skills related to science learning**, such as reflexive thinking and learning autonomy.

In general, **from researchers' observations during the workshops, students interacted and asked questions to the facilitators**, without showing any difficulty or barrier. During the activities, they asked **questions related to both the format and guidelines of the activities but also to the content**. For instance, students easily asked the facilitators when they did not understand some specific terms used. Facilitators established since the beginning **a horizontal relation with the students** that facilitated their involvement. Students were also invited by the facilitators **not to judge others' ideas and to respect the time devoted to share students' ideas**. In that sense, **a context of trust was settled quite quickly among the whole group**. Such climate has been highly **recognised by students**, who reported among their Learning Charts that they have learned about their topics and other things thanks to the **climate of trust and good mood** present during the workshops, especially students from Group 2.

In such context, the **time devoted to students' reasoning and argumentation** occurred through **two different approaches**: the **reflection activities** (Societal Challenges, Critical Thinking, and Gender) and the time of **sharing students' research questions**. In relation to **these reflection activities**, students could share their ideas, argue or develop reasoning **during three workshops: PW1 (i.e. selection and the elaboration of their project related to societal challenges and 25 minutes of presentation); PW3**, in which students spent 40 minutes of work in subgroups for the reading of the three articles and 30 minutes of debate with the whole group; and **PW4**, in which students spent 30 minutes for the role play about gender and 10 minutes of debate about the activity in whole group. In that sense, **students' opportunity to reframe scientific concepts**, to relate ideas in multiple contexts, **occurred mostly during these three workshops**, although some other more reduced moments also occurred during PW5 about student's own research questions.

Furthermore, the format of some of the activities did not seem to reach a real fostering of students' reasoning and argumentation. Indeed, for instance in Group 1, it seemed **much more difficult for them to elaborate written ideas** when it was proposed **than debating or proposing ideas verbally**. It was for instance the case during PW3 on Critical thinking: during the time devoted to argumentation and answering to the questions related to the articles, most of the students did not really take the time to write them down. Most of them did not really engage in reading the article and reacting to the questions raised. In parallel, **it seemed difficult for the students to approach the topics and develop their ideas**. For instance, in Group 1 during PW1, when students were presenting their project (on Societal challenges), it was hard for them to develop their ideas and to answer the questions the public (mostly the facilitator and the ECR) asked to them. However, this might be also due to the schooling abilities in this specific group. Indeed, as also showed with students' ability to formulate research question **a contrast existed between both groups regarding their learning skills**. Due to this fact, teachers highlighted the limitations of such activities on reflection. Teacher 2 (Group 2) said that it seemed to her that the activities on critical thinking lasted really long, and that it might have worked in Group 2 because *"this group was more comfortable with schooling than the other, in that sense, it probably changed the way these topics have been assessed. Because in this group they were more comfortable with schooling tasks, it was good, but to last so long on analyzing articles would not have been so simple with the other group [Group 1]."* In Group 1, in that sense, student's involvement in **reasoning and arguing occurred more easily** during the **debates than when asked to think through and with written supports**.

Overall, **students easily participated in dialogue and debate**. However, **students' engagement in sharing their ideas**, argumentation and debating varied a little bit according to the context. For instance, when they were debating in whole group, between 1/3 and 3/4 of the students participated depending on the topics approached. In general, in **Group 1, students were enthusiastic and dynamic while debating in whole group**. For instance, during PW3 on Critical thinking, many students proposed ideas, shared their points of view, and could express what they thought and develop why, based on their own experience. This situation occurred thanks to the way both **facilitators led the debate, as they were trying to push the students to reflect about their own comments** (related to student's conclusions on the articles). Moreover, even if some comments made by students were disconnected from the topic, **the facilitators did not censure them, but rather tried to use what the students were sharing in order to use it for coming back to the main topic**.

Moreover, in relation to students' own process of learning to learn, both students and teachers reported that it **was not clear why these activities were made for**, and that there was somehow a **disconnection between the reflections** about the topics proposed during the activities on Societal Challenges, Critical Thinking and Gender **and the reflection on students' own research questions**. In that sense, although some students recognized the general interest of these activities, as for instance "to think about all", they were quite sceptical towards the interest of these activities, and shared their feeling that *"it was not in the context, it was out of their topics"*, and deplored that they *"looked like school"*.

In relation to **students' own research questions, the time devoted** to explore their topics and for students to develop their ideas and research **was reduced**. Students were first invited to list the different topics they would like to work on during **PW1** (15 minutes for brainstorming on potential research topics), and to further specify their own research question during **PW3** (15 minutes for defining students specific research question). Then, at the end of this session, students were asked to look for information about their topic in their own, invited by the facilitators to use the online Moodle system. However, **few students did take the time to look**

**for answers** and did not apparently understand the value of homework (see Goal 4). Teachers reported they devoted a two hours session with students (mostly from Group 2) and said that students *"made their research assiduously and went with their paper to the next session"* (Teacher 3 Group 2). However, it depended on the group as in Group 1, only few of them did come to the next session with inputs of their own researches. In that sense, students reasoning about their own research question occurred mostly during two workshops: during **PW4**, in which they spent 20 minutes for finding ideas and argumentations thanks to a round of speaking (but going only some of the student's questions were assessed) ; and during **PW5**, in which 20 minutes were spent to explore questions related to two main topics assessed by students (on the three) and 30 minutes to elaborate the scene related to every of the two topic, and to **PERFORM** it. Therefore, overall, **almost 70 minutes were devoted to explore students' research question, by fostering students to reason and develop their ideas.**

Then, during the time devoted to students' own research questions, not all the questions were assessed and **the topics explored could not be developed in a deep way, allowing a broader contextualisation and a research of scientific relevance.** During PW4, the facilitators asked students to present their research. In Group 1, only few students participated explaining their ideas, as most of them had not made their homework. In Group 1; one girl who did research explained the main causes of tiger extinction and was able to clearly explain the three main factors. When asked the other students, almost none of them reported they did research. Thus, during the speaking round, the others tried to elaborate, some were constructive and logic, while others was far from the reality. However, after such round, almost no time was devoted to further explore students' research process on their own questions, with the exception of a scene approaching biodiversity conservation. In this scene, students were invited to develop an argumentation for a debate between pro and anti-conservationists and they tried to give ideas. However, the debate did not go deeper and stayed mostly at the superficial and exaggerate level. In that sense, **the process of reasoning about students' topic was really reduced.**

Therefore, **students reflective thinking on their learning was limited**, as most of them could not really explain either what they have learnt during the project about their own research question, or the way they have learnt about it.

However, in contrast to reflective thinking on learning science, the **workshops have facilitated students' awareness of their own process of learning to perform.** It occurred thanks to **students' assessment or reflection about peers' performance** that was invited by the facilitators since the beginning of the activities related to theatre exercises. Indeed, when students were performing in front of others, facilitators invited the public to be attentive to the performance. The others were generally quite reactive, sharing ideas **and pushing the ones performing to follow.** When the facilitator was commenting student's performance, the public approved and managed to use the comments to improve their own performance. In that sense, the **facilitators invited students to adopt a constructive and benevolent assessment** of their peer's performance by **asking them to be aware of the behaviour, the attitude every person performing took** and to **remember what they found well done or not.** In general, students were pushing their peers to continue, acknowledging them for their performance, especially during the last sessions and the different rehearsals. In parallel, students could also develop **a higher awareness of their own process of learning**, as facilitators were asking them frequently to express their feelings during the exercises.

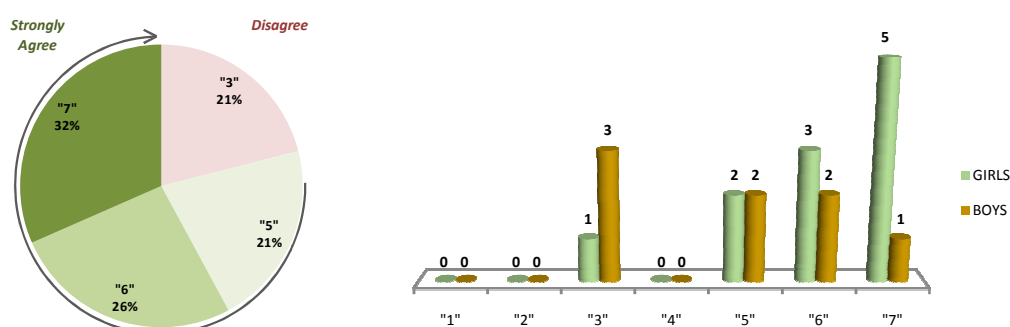
Finally, it seemed that the workshops did not really foster **students' process of learning autonomy.** This might be mostly due to from one side the **low involvement of students in their own research question** but also to the format of PERSEIA construction that was directed by the facilitators. In that sense, except few occasions during which students had to spend

time for their own to think on their topic, they were mostly in company of an adult that was shaping their process of both reflection and creation of the PERSEIA.

## SOCIAL AND CIVIC COMPETENCES

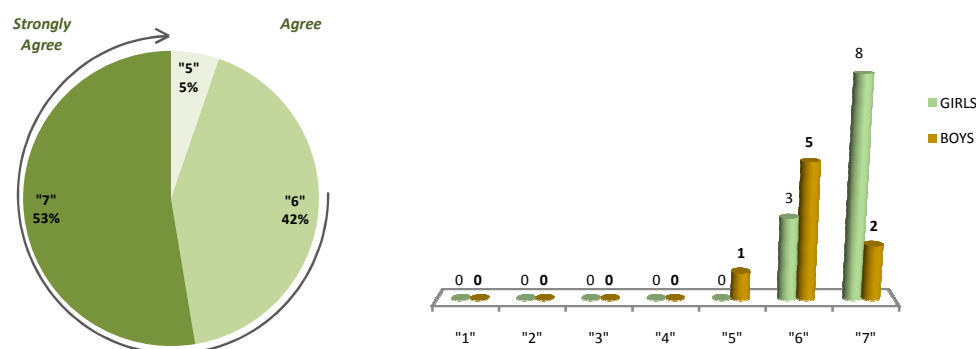
All along the workshops, students reported they actively participated and shared with tasks with their peers.

Indeed, regarding **students' participation in the workshops**, more than 3/4 of the students reported that **they "actively participated in all the group tasks during the workshops"**; with only 4 students who answered negatively, including 3 boys. In that sense, a higher proportion of girls strongly agreed with this statement (statistically significant difference).



### ***"I actively participated in all the group tasks during the workshops"***

In the same line, all the students agreed to say that they **"shared different tasks within their group during the realization of the workshops"**. As for the precedent question, a higher proportion of girls than boys answered they were strongly agree (7 on the scale from 1 to 7) (statistically significant difference).



### ***"I shared different tasks within their group during the realization of the workshops"***

**Coherent with students' inputs**, teachers reported that the participation of the students during the process was high and that they got involved in collaborative tasks as they use to do in class. Furthermore, from **student's focus group**, all of them **reported they really appreciated to work in a collaborative way** and to **feel being part of the group during the workshops**. In the same line, some students reported that **what they liked the most during the workshops** was **"working together"**. When asking students during the focus group why they appreciated to work together during the workshops, one student reported because **"we could share opinions with others"**.

Overall, **students asked for help without any problem, for issues related to the contents reflections and their research, but also to the exercises related to performing arts.** For instance, during PW2, students asked for help when they did not know what to do, or they did not understand the aim of the exercise. Moreover, students helped each other, as when some student did not have any ideas for performing the activity, the other encouraged him/her with ideas.

In general **students were respectful towards each other and others' ideas.** Although it **was really common** in Group 1 **to hear students making jokes and teasing the others**, which could be initially perceived as quite aggressive, it was more a kind of humour, as shown by the reactions of the different students. Overall, it was observed that **students' respect towards others' ideas increased along the workshops.** In contrast with the first sessions, students, during the last ones, were less often teasing each other and were more attentive to others' ideas and performance. There was not any major **difficulty within student's group during the different workshops led.** Moreover, in order to avoid tensions between students, facilitators were really attentive and frequently asked students to be respectful.

Regarding **the establishment of collaborative work in the workshops**, facilitators established different contexts that fostered such collaborative dimension through three main mechanisms. First, during the different exercises related to performance, students were frequently asked to create little improvisations in group of 4-5 students. During these exercises, **students had to be attentive to the others' ideas and propositions**, and to **develop a listening and look on others' performance** in order to create a cohesive picture. Second, when creating the different sketches for the PERSEIA, students had to **rehearse together several times in which they had to learn to work as a whole unit.** Finally, to a lesser extent, students also had the chance to **think about the content and the development of their own sketches**, what pushed them to be attentive to others' thoughts, to find agreement on what they wanted to develop and express (even if this aspect was reduced, as explained before). As an example, sometimes, the ones who were more comfortable with the activities and were proposing ideas were also pushing the others to give other ideas. An interesting collaborative situation occurred spontaneously when the subgroup of interviewers shared their responsibilities in Group 1 (during PW4 role-play game). There was not any leader but rather collaboration between them that occurred without any previous guideline from the facilitator. During the role-play, the four different interviewers spontaneously shared the different responsibilities of the play.

In parallel to the fostering of collaborative skills, an important aspect of the social and civic skills that were developed during the project related to **communication competences.**

Indeed, from both students' inputs, the project seemed to allow students **to improve their communication skills.** Students clearly reported that they learnt "*oral skills*", "*to express orally*", or "*to articulate*" thanks to the project, but also **performing skills, i.e. to express themselves with the body.** In the same line, teachers also reported that one of the main impacts the project had **on students related to their communication skills, what teachers could already observe during the lessons.** For instance, in relation to one girl, Teacher 1 (Group 2) said: "*This really helped her a lot. Then, I asked them to prepare a text and to read it, and she was the one who read it the best, [...] we could hear her really well, with no grip, and she is dyslexic. This experience really raised her.*"



Indeed, since the **second workshop**, a real **effort was done in order to foster students' ability to express orally**. Many exercises implied the use of the voice, in order to better articulate, to link both the body and the voice, and to learn breathing and body awareness. Facilitators from both groups devoted time to propose these exercises, giving them feedbacks, in order to improve student's ability to play and embody their role for the performance.

Moreover, **students were asked to involve their body in order to express ideas and emotions**. Among the different exercises, students were asked to first be aware of their body, voice, breath and to adopt a presence in scene, erasing their own tics and movements and trying to have neutral presence. Then, they were also invited to embody ideas, emotions and feelings. Specifically, the whole session of PW2 dedicated to performing arts, and then around half of the session in PW3, PW4 and PW5; and the whole sessions of PW6 and PW7. For instance, exercises developed in this line invited students to illustrate daily situations by using only the body. During these performances, such as the "living painting", students were really active, enthusiast and creative. This **body awareness and process of learning to communicate not only through verbal pathways** took place within the different workshops. In that sense, **both the oral and body language have been intensively trained during the different workshops**.

## SENSE OF INITIATIVE / ENTREPRENEURSHIP/ ABILITY TO MANAGE PROJECTS

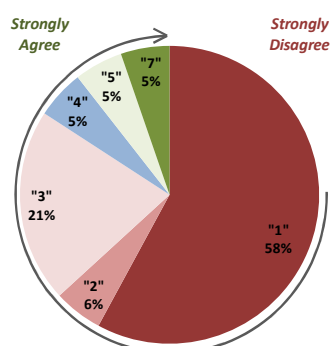
**No clear leadership among students occurred during the workshops**, in none of the groups. It was **rather punctual initiatives from different students**, varying according to the type of activities and exercises performed. In this sense, some students were more comfortable than others to communicate and get involved in the activities, and some students participated more than others. However, there were not always the same students who were the most active in the different activities and workshops.

**This almost absence of leadership** among students might be mostly **due to the way the different activities and the creation of the final PERSEIA have been thought and established**. Indeed, all students were invited by the facilitators to participate to the activity. Even when some were more involved, proposing spontaneously ideas (both during the debate and the theatrical exercises), facilitators were pushing the whole group to participate, allowing the less active students to get involved in the different activities by regulating the impulsions of the most dynamic. Moreover, during the realization of both the activities more related to reflection (in subgroups or whole group) and the theatrical exercises and rehearsals, students were **guided by both facilitators**. In this sense, in contrast with other case studies where students had the space to interact only between themselves to think or/and create their PERSEIA, students in Vauréal (and also in Marie Curie) **did not spend time to work only between themselves** and thus to **face to potential situation of self-organization and thus to leadership**.

As students could not have the space to self-organize their own work in team, **students' ability to manage and plan their project could not really be observed during the workshops**. However, they did manage individually their own engagement in the project by learning the choreography and their text. This has been also largely helped by teachers' involvement outside the workshops (see Goal 1).

This said, **students' own initiative and creativity were stimulated all along the project** in both the different exercises and the creation of the different sketches for the final PERSEIA. Once the different topics were chosen, facilitators invited students to do several exercises related to a certain form of theater or a topic. During such situations, students were spontaneously proposing ideas for the scene, by directly acting them. Then, facilitators took note of the different ideas students proposed when improvising about the topics and used them to create the scene. In that sense, the **elaboration of the PERSEIA was embedded in students own creativity**, in which most acting ideas *"emerged really easily and quickly"*, as students said.

Several students reported in both surveys and in the focus group that **they gained self-confidence through the project**.

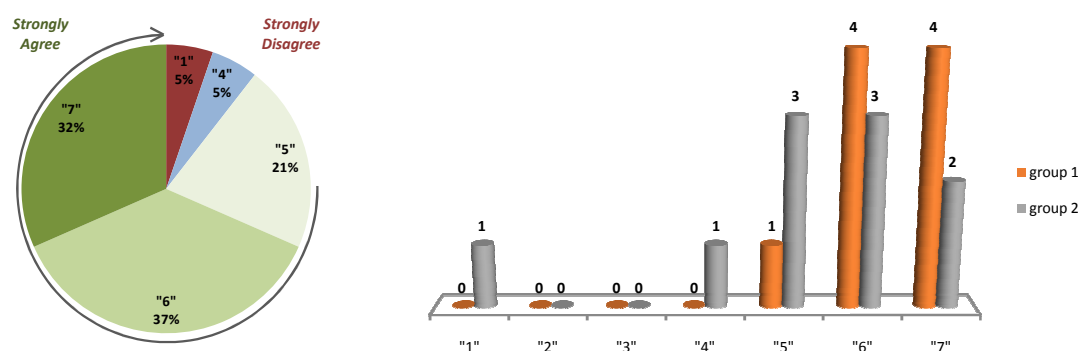


Regarding first their perception towards the PERSEIA, the majority of them reported they ***"felt prepared to perform the***

**PERSEIA**". Only 2 students reported not having felt prepared and 1 student reported a neutral answer, explaining that it was due to the **lack of additional sessions**, as they would have **liked to have more sessions** to rehearse and prepare the final PERSEIA.

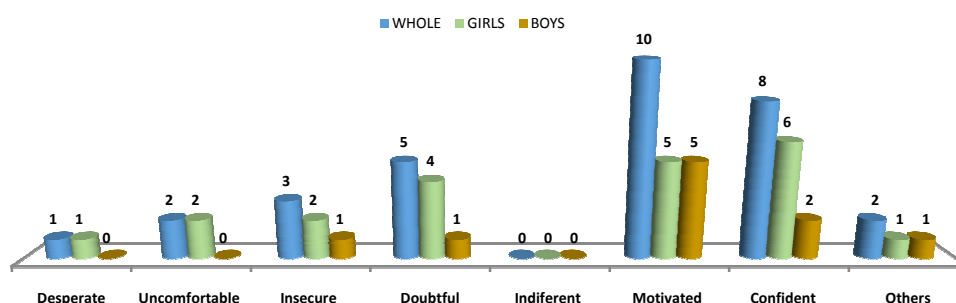
Regarding the whole process, when asked about what they learnt through PERFORM, one student specifically said *"I got more confident with myself"*. In the same line, and similar to communication and collaborative skills, **teachers reported that the project seemed to have an impact on several students, but especially among the shiest ones**. For instance, about one of them a teacher said that *"at the beginning, he was a little bit introverted and then, finally, he began to participate much more in class, to not worry about other's opinions. Before, it was the other way around."*

When regarding further on the overall process of the workshops, all students felt **"confident during the workshops"**, except 1 student who reported she did not feel confident and 1 student reported a neutral answer (from Group 2). Students from Group 2 tended to provided less strong answers than Group 1 (significant differences).



### **"Did you feel confident during the workshops?"**

In order to further explore students' feelings, we asked them about **"how (they) felt during the workshops"**. Such answers confirmed that most of them were motivated and confident. We could also see that except one girl from Group 1 who felt doubtful during the workshops, the other students who reported 'negative' feelings belonged to Group 2. They were specifically three girls, including one who explained to us that it was mostly due to her general lack of interest towards the project and towards science.



Overall, during the focus group, students explained that they felt confident during the workshops thanks to **the playful climate and amusement present during the workshops**.

**All along the process of the project**, it could be noted that some students tended to **involve themselves in an easier way in some activities than others**. The **contrast could be seen between the activities that involved reasoning and argumentation** - echoing schooling tasks - and **the performance of acting**. Some students were clearly **more comfortable when they had to act than to present reasoning and sharing ideas**.

Students' self-confidence was **even more observed during the last rehearsal and the final PERSEIA**. Many students, who had shown reactions of shyness or discomfort during several exercises and workshops, performed their scene without hesitation, being present in the scene, speaking loud and embodying the role play they had rehearsed (see Goal 2).

This self-confidence improvement might have been largely **driven by the way facilitators led the exercises and the whole process**. Indeed, as mentioned elsewhere, thanks to the **sharing of feelings about their own and also peers' performance** while realizing the different exercises and rehearsals, students could express their emotions. For instance, when students were uncomfortable with an exercise or did not know what they were supposed to do, they could express it easily, what was considered by the facilitators who provided them support. Although not all the students were able to express what they felt, the fact that some of them could have share their emotions might have probably enhance the **climate of trust and confidence among students**.

## Collège Marie Curie

The PERFORM Project took place in the school *Marie Curie* in Paris from January the 27th to May, the 23th date of the final PERSEIA.

It involved a total of 22 students (10 boys and 12 girls) divided in two subgroups of 11 students each. Although only 18 students performed PERSEIA, 21 students to both the Pre and the Post PERSEIA questionnaires.

### **Highlights**

#### Learning to Learn

- ❖ **Students' perceptions towards the importance of learning science for their future and their self-perception of ability to formulate research question did not really change after the workshops.**
- ❖ **Students were comfortable with participating, by actively asking questions and sharing ideas between themselves and with the facilitators,** in the way that suggested their interest towards the creation process. This **fluent communication has been certainly partly due to the horizontal relation and climate of trust the facilitators established** since the beginning of the workshops, similar to Vauréal's context.
- ❖ The **use of humour** really helped to foster this fluent communication but it allowed also students to **maintain the concentration** among the whole group.
- ❖ **Students' ability to share ideas differed according to the dynamic,** with a **lower participation of all the students** during the dialogue with the **whole group** than during the activities in subgroups.
- ❖ **Students' reasoning on their own research question has been more developed than in Vauréal,** as one of the reflection activities was taken out the workshops.
- ❖ **Students' reframe scientific concept and develop their ideas occurred during 2 workshops and to a deeper extent during the time devoted to explore students' research question**
- ❖ **Learning autonomy could not really be observed** during the project. **However,** in contrast with Vauréal, **students tended to be more focused when performing both reflection activities and work in subgroups for the creation of the PERSEIA.**
- ❖ **Contexts in which students' ability to appropriate and reframe scientific concepts varied according to the workshops.** It occurred during two workshops in relation to two different activities (Societal Challenges and Critical Thinking) but was then **further developed** during the times devoted to **explore research questions**. Both in subgroup and in whole group, discussion centred on students' research questions generally easily captured student's attention and general dialogues among students.
- ❖ **Students' assessment towards peers' performance mostly occurred in a benevolent and constructive way.** It might have been allowed, at least partly, by the **guidance** the facilitators provided to the students.

#### Social and Civic competences

- ❖ **Students' collaborative skills have been fostered** and have conducted to a **better integration of some students in their classroom.**

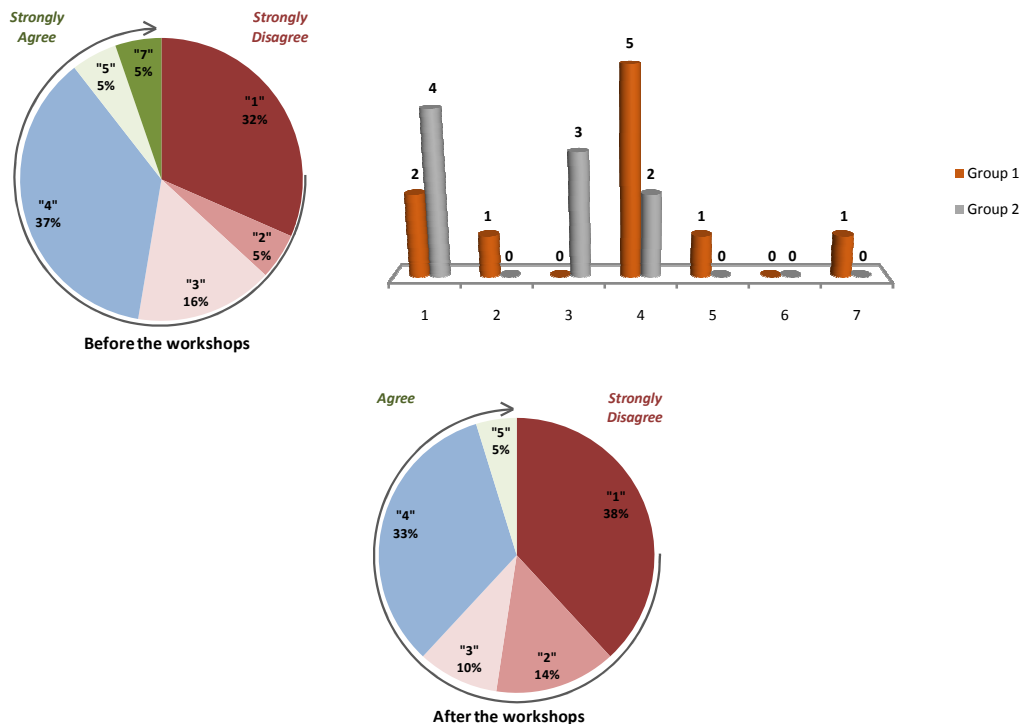
- ❖ **Collaborative dynamic** settled in the workshops were recognized by students as a **major aspect of their learning process**.
- ❖ **Students' communication skills** have been **largely reinforced, thanks to** the **development of the different theatrical exercises** all along the workshops.
- ❖ **Not all the students reported having highly participated into the project**, and having **shared work with their peers, as some students did not want to participate since the beginning of the project**.
- ❖ All along the workshops, students showed a **general relation of respect and help with the others**, and **no major difficulties** among themselves were observed. Even if some tensions occurred (mostly due to some students who did not want to participate), the facilitation allowed this tension not to impact students' relation.
- ❖ All along the workshops, the different activities **fostered students' body awareness, and the use of the body to express emotions and ideas**.
- ❖ Similarly, **students have been largely trained to express orally**, thanks to the different exercises proposed by the facilitators.

### **Sense of Initiative**

- ❖ **Neither clear leadership among students nor clear students' ability to manage and plan a project** was observed while doing the workshops and for the creation of the PERSEIA, mainly **due to the fact that students could not have the space to self-organize their own work**. However, there were some students more dynamic in the activities and who tended to be drivers of the activities., some students did intervene towards others who were disrupting the activities.
- ❖ The use of **theatrical improvisations** as a way to raise students' ideas for the elaboration of the PERSEIA **allowed students to develop a sense of initiative and creativity**
- ❖ **Students' self-confidence has been largely fostered** during the project (especially among girls), thanks to the **theatrical exercises** and the **attentive and benevolent facilitation** provided during the workshops.
- ❖ **Self confidence and students' ability to open themselves** have been recognized as **main outcomes of the project**.

## LEARNING TO LEARN SKILLS

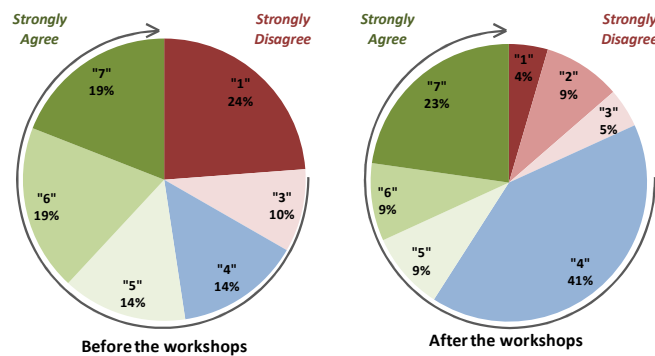
Before the workshops, **more than half the student (53%) disagreed that "learning science is not important for [their] future success"**, and 7 provided neutral answers. Answers given by the students significantly differed according to their groups: whereas all the students from Group 2 disagreed or were neutral towards the statement, **some students from Group 1 answered they agreed with it**, i.e. they considered that learning science was not important for their future success.



### "Learning science is not important for [their] future success"

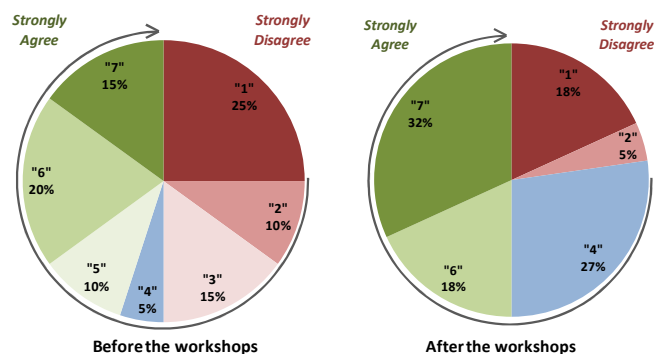
Of the 21 students who actually responded to both the pre and post surveys, most of them didn't change their opinion, but tended to provided more negative answer in the post survey (average of the variation = -0.56). This **variation was however significantly different for the one occurring in the Control group** that had a positive variation (0, 74), suggesting that students from the control group tended to provide more positive answers during the Post PERSEIA survey than during the Pre. In this line, after the workshops, the **proportion of students who disagreed with the statement increased**, meaning that more of them perceived science as important for their future success.

Half of the students agreed to say that **"What [they] learn in science class will help [them] to get a job"**, and 14% of them provided a neutral answer. After the workshops, the **proportions significantly changed**, with an increase of neutral answers (41%) and a decrease of positive answers. However, this variation was not different from the one from the Control Group.



**"What [they] learn in science class will help [them] to get a job"**

Before the workshops, 45% of the students reported they were **"able to formulate research questions"**. Although most students tended not to change their opinion (average variation=-0.32), there was an increase of the proportion of neutral answers after the realization of the workshops, (from 5% during the Pre survey to 27% during the Post survey) and a global decrease in negative answers. Interestingly, in the Post survey, students **from Group 1 tended to give more negative answers than in the Pre-PERSEIA survey**(average variation -1.36), **while students from Group 2 tended to provide more positive answers** (average variation=0.045) (significant difference between both groups).



**"I am able to formulate research questions"**

Although answers from the questionnaire did **not allow us to say that the project could have impacted students' perceptions on their learning of science**, in the following part we explore **how the context and protocols developed during the workshops helped students put into practice different skills related to science learning, such as reflexive thinking and learning autonomy**.

In general, **students were comfortable with interacting and asking questions to the facilitators**, without showing any difficulty or barrier. **As happened in Vauréal**, students asked **questions related to both the form and the way the activities had to be realized, but also to the content**. Students easily asked the facilitators when they did not understand some specific terms used, but also when they wanted to know the reason why they were asked to do some or other activities or exercises. For instance, some of them easily asked the reasons of the exercises realized during the warming up, **suggesting interest towards the creation process**. Overall, in Group 1, students were curious towards the process of the PERSEIA construction.



Similar to the relation created in Vauréal, facilitators established since the beginning **a horizontal relation with the students**, and used a lot their **sense of humour** in order to create **a playful climate**. This context of learning **was recognized by students as a really appreciated aspect of the project** where they could *"have been learning new things by having fun"* (especially reported by students from Group 2), as it was *"serious and not serious at the same time"*. Moreover, students were invited **not to judge others' ideas and to respect the time devoted to share students' ideas**. Therefore, a **context of trust** has been quite quickly settled among the whole group.

In such context, and similar to the Vauréal's context, the **time devoted to students' reasoning and argumentation** occurred through **the realization of the reflection activities** (Societal Challenges, Critical Thinking, Gender) and the **discussion about students' own research questions**. Two workshops explored the reflection activities: **PW1** (25 minutes for the exploration of the societal challenges and 20 of presentation), and **PW3** (40 minutes of work in subgroups for the reading of the three articles and 10 minutes of debate). In contrast with Vauréal, the **activities related to Gender and Stereotypes did not occur in Marie Curie**, as this session was rather dedicated to explore with students results of their research questions.

In that sense, time was devoted to explore **students' research questions** during different workshops: in **PW1** they had to list the different topics they would like to explore (15 minutes for the selection of the research questions); in **PW3** student had to identify their specific research question (30 minutes for developing their research question), **PW4** (50 minutes of discussion about research questions), and **PW6** (30 minutes to explore the results of the research questions). In that sense, because the activity initially thought for PW4 was taken out, **students from Marie Curie could work on their research questions with the facilitators longer than in Vauréal**. Moreover, **time was devoted to reframe scientific concepts through the exploration of students' own research questions**.

Even if to a lesser extent than Vauréal, **students' involvement in reasoning and arguing varied according to the format of the activities**, with a higher involvement when it related to students' own questions than on other topics, and also when they were debating as a whole group than during the time in sub-group devoted to reflection (reflection activities). In contrast with Vauréal, **students seemed more comfortable with the appropriation of the topics and the reasoning on scientific aspects**. Overall, **students easily and actively participated in dialogues and debates**, whatever the topic assessed. This situation occurred thanks to the way both **facilitators led the debate, as they were trying to push the students to reflect about their own comments** (related to student's conclusions on the articles). Even if some comments made by students were disconnected from the topic, **the facilitators did not censure them, but rather tried to use what the students were sharing in order to use it for coming back to the main topic**. However, little time was devoted to explore every group's project so the debate and the reflexion could not go deep. For instance, during the debate about the articles in PW3, only 1/3 of the students really got involved and managed to express a generalization of the conflict of interest among the different societal challenges and lobbying that surround science.

Moreover, in relation to **students' own process of learning to learn**, students after the workshops recognized that they could **learn thanks to the debate**, and one specifically expressed that she *"liked this way because everyone could express their self"*. In the same line, one student also reported that what she liked the most during the project was *"to share ideas with others"*. However, similar to Vauréal's context, both students and teachers reported that it **was not clear why reflection activities were made for**, and that there was somehow a

**disconnection between the reflections** about the topics proposed during the activities on Societal Challenges and Critical Thinking **and the reflection on students' own research questions**. Students also recognized that they could not enough prepared the PERSEIA because of **the involvement in other activities not directly related to the performance**(see below). As the following quotation illustrated, students regretted somehow the **disconnection between some activities and the construction of their PERSEIA**.

"Me: *In general why did you feel you were not prepared enough for the performance?*

Boy2: we did not have enough sessions  
(...)

Boy 1: *well, most of the sessions we were spending time on other things (...) like these activities, such as the one related to the coca cola, these did not serve for anything*  
[Several students approve]

Girl 2: *yeah, the first sessions were more like school lessons than really a work on the project for the performance.*

Boy1: *exactly !!*

Girl3: *Yes, it took really long to get to work on the main topic*

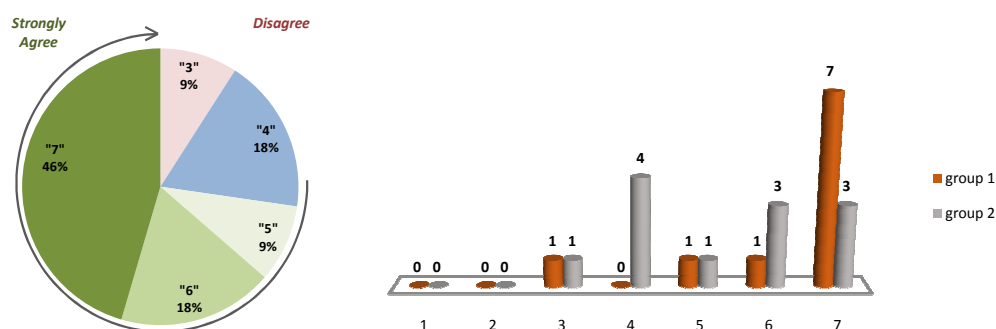
Girl2: *yes, it was a pity*"

As in Vauréal, students could develop **a reflective thinking in relation to their learning to perform**. It occurred mostly thanks to **students' assessment or reflection about peers' performance** was invited by the facilitators since the beginning of the activities related to theatre exercises and the creation of the different scenes. Overall, students were generally quite reactive and shared ideas and comments to the others. When students were performing in front of others, facilitators invited the public to be attentive to the performance. Since the first workshop, when students were performing, **the others were reactive, laughing, and encouraging the ones performing to keep on with the work**. When the facilitators were commenting student's performance, the public approved and managed to use the comments to improve their own performance. The **facilitators invited students to adopt a constructive and benevolent assessment** of their peer's performance by **asking them to be aware of the behaviour, the attitude every person performing took and to remember what they found well done or not**. Moreover, time was devoted to express students' feelings after the performance of some exercises or scenes. Students easily shared them with facilitators and the whole group and could highlight the interest of the exercises. In that sense, **students could be more conscious of their own progress and process of learning and performing**.

**Regarding students' process of learning autonomy**, as most of the work in subgroups was done with the guidance of a facilitator, it was somehow difficult to observe the level of autonomy students might have held. Moreover, **students' engagement into their own research at home was quite low**. As instance, in Group 2, facilitator reported that she had to always stimulate students' interest in the Facebook group in order to have little answers. However, when working sometimes in subgroup and without facilitators, students **managed to organize themselves in order to prepare the scenes**. Different from other case studies (such as Spain), in which students had to work together to create their PERSEIA, most of the work realized to construct the final performance was guided by at least one of the facilitator (who took the role of director). In that sense, during the few times students were kept alone without adult guiding them, their **autonomy and thus their involvement into the activities highly depended on the students**. While it was really easy for some students to stay concentrated and to follow the activity, some others were more passive and did not involve energy to do the tasks asked.

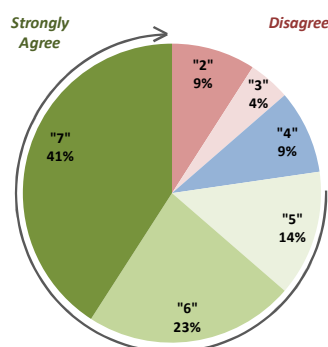
## SOCIAL AND CIVIC COMPETENCES

More than 3/4 of the students reported that they had **"actively participated in all the group tasks"** during the workshops; with only 2 students who answered negatively (one per group). Only students from Group 2 provided neutral answer to this statement (the differences between groups are significant).



### ***"I actively participated in all the group tasks during the workshops"***

In the same line, more than 3/4 of the students agreed to say that they **"shared different tasks within their group during the realization of the workshops"**.



### ***I shared different tasks within their group during the realization of the workshops***

From student's perspective during the focus group, they reported that they could **share with their peers**, but also said that they already share tasks in their classroom. It was also confirmed by the teachers who reported that even before the project, students from this class tended to show a collaborative dynamic. In the same line, six students from both groups reported they could learn new things during the workshops (specifically related to their research question topic) **thanks to their peers**. In the same line, teachers acknowledged that the workshops could have helped some of the students to better communicate with others and to be somehow **more integrated in their own class**, specifically for some of them that were not French or really shy in general. In this sense, they saw the project as **positive for the better integration of some students in their classroom**.

Students **easily shared with other students or facilitators when they needed help**, either when they did not understand or did not manage to do what the facilitator were asking

them to. **Facilitators were reactive to students' demands and always provided help to students** by giving examples, ideas or different inputs. **Students also helped each other** in both groups to develop new ideas and invent questions, as was the case when students were looking for their research question. In these cases, when someone did not know what to explore, other students spontaneously proposed questions to their peers in order to help them find their own research topic. In Group 1, during the elaboration of the surveys, at the end of the work on subgroup, one girl came to another group in order to help correcting the orthography of the survey they wrote.

Overall, **students' respect towards other and others' ideas was high**, although it depended on the workshops. Most of the time, even when some students were proposing weird ideas, the others were laughing but without joking. However, during some workshops, **some tensions and reactions of less respect occurred**. In such cases, as for instance when the students were commenting the way another was talking, by both using jokes and non-verbal language, the tension generally did not last long and **facilitators quickly handled it by asking for calm and respect**. No major **difficulty between students was observed during the different workshops**. However, as also reported in Goal 1, tensions **occurred during some workshops as some students did not want to participate** and were thus disrupting the whole dynamic. However, **these tensions did not affect students' relation**. For instance, in Group 1, during one workshop, even if the entrance of a new student interrupted the introduction of the session; none of the students did intervene. They were quiet and waiting for the situation to calm down without making any comment. At the end of the process, during the two last workshops, some students were more dispersed and noisy than others and slowed down the fluency of the session. In these moments, some girls were asking guys for silence and concentration. This was done in a not really sympathetic way.

As also reported in Vauréal, different contexts fostered **the establishment of collaborative work in the workshops**. First, during the different exercises related to performance, students were frequently asked to create little improvisations in group of 4-5 students. During these exercises, **students had to be attentive to the others' ideas and propositions**, and to **develop a listening and look on others' performance** in order to create a cohesive picture. Second, when creating the different sketches for the PERSEIA, students had to **rehearse together several times in which they had to learn to work as a whole unit**. Finally, to a lesser extent, students also had the chance to **think about the content and the development of their own sketches**, what pushed them to be attentive to others' thoughts, to find agreement on what they wanted to develop and express (even if this aspect was reduced, as explained before).

When asking students on what they had learnt thanks to the project, many of them reported **skills related to communication**, such as **managing the stress, to be able to speak in front of others, how to behave when communicating**, but also the "*listening*".

Regarding such **communication skills**, we could observe that most of the **sharing and elaboration of ideas was realized verbally**. In that sense, and similar to the way workshops were established in Vauréal, **students in Marie Curie have been asked to use their body and their voice to express their ideas and feelings since the second workshop**. For instance, during PW2, first workshop in which students had to explore theatrical exercises; the facilitator asked them to play a duo with a foreigner scientist accompanied by his/her translator. In this exercise, students playing the young researcher had to speak in an imaginary language, in order to be translated by his/her companion in local language. In that sense, students had to

explore their body, by going beyond the language, in order to be understood by the other. Most students were able to do it without difficulties, even if some showed higher capacities to express themselves than others. **All over the project, a real effort was done in order to foster students' ability to express orally.** Many exercises implied the use of the voice, in order to better articulate, to link both the body and the voice, and to learn breathing and body awareness. Facilitators from both groups devoted time to propose these exercises, giving them feedbacks, in order to improve student's ability to play and embody their role for the performance.

Moreover, as happened in Vauréal, **students were asked to involve their body in order to express ideas and emotions.** Among the different exercises, students were asked to first be aware of their body, voice, breath and to adopt a presence in scene, erasing their own tics and movements and trying to have neutral presence. Then, they were also invited to embody ideas, emotions and feelings. For instance, exercises developed in this line invited students to illustrate daily situations by using only the body. This **body awareness and process of learning to communicate not only through verbal pathways** took place within the different workshops.

As a results, among the **different scenes of the PERSEIA**, students had to explore their body in order to express ideas and stories: the relation between animals and human beings, the *coryphée* about conflicts between districts (see Goal 2). In that sense, **the whole creation of the PERSEIA encouraged students to explore their bodies more than the words to express their ideas.**

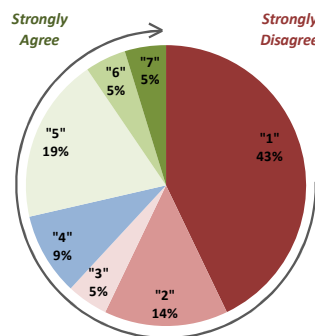
## SENSE OF INITIATIVE / ENTREPRENEURSHIP/ ABILITY TO MANAGE PROJECTS

Overall, there **was not any clear leadership during the workshops**. As it was the case in Vauréal, it was mostly due to the fact that most of the activities were guided by at least one facilitator. In that sense, there were not many occasions for students to self-organize and to show potential leaderships among students' own groups. However, **there were some students more dynamic in the activities and who tended to be the drivers of the activities**. For instance, in Group 1, regarding the work on their research questions, one girl was leading the group, by proposing a lot of questions. She also asked her colleagues to intervene and share their ideas with the whole group. In the same line, in Group 1, some students tended to monopolize the word. They were few, almost four to five to be really engaged into discussion, and the others were quiet. In other moments, **some students did intervene towards others who were disrupting the activities**. For instance, in Group 1, there were almost four boys who tended to be more disconnected and to disrupt the dynamic of the workshops. During such moments, there were mostly two-three girls who were active and involved into the process of the rehearsal who frequently asked the boys to come back to the activities and concentrate. Because students had really few occasions to self-organize, **students' ability to manage plan and project could not be really observed during the workshops**.

**Students own initiative and creativity** mostly occurred during the creation of the different scenes. In contrast with Vauréal, as more time was devoted to explore students' own research questions, ideas and creativity were also fostered when debating, building the different scenes of the final PERSEIA. However, students could also develop their own ideas by working on their own questions for the creation of the PERSEIA. For instance, a subgroup of students from Group 1 had to construct and conduct a survey among their peers. During the moment of the creation of the survey, they were really reactive and curious, and proposed a lot of different questions.

Regarding **the emotional dimension**, teachers reported that the project was beneficial for several students who **gained a higher self confidence**. Teachers also acknowledged that the project might have allowed some students **to open themselves**, as one of them who *was really aggressive and cold before the workshops changed through the process and became more pleasant and relaxed* (Teacher group 2). They also recognized that some students who were shy or anxious benefited from the project. *"I guess there were positive outcomes: students who were shy and totally closed to the idea of going on stage, they progressively came to like Paul and Co's interventions and they were at the end on stage and were present and active during the workshops, thus..."* (Teacher group 1)

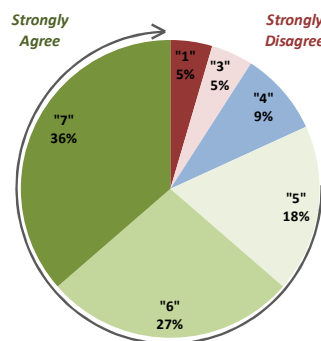
When looking at students' perceptions, we saw that **more than half** the students disagreed with the statement **"Despite the rehearsal during the workshops, I did not feel prepared to perform the PERSEIA"**. Six students agreed with it and 2 students reported a neutral answer. The proportion of strongly agree was significantly higher among girls than boys.



***"Despite the rehearsal during the workshops, I did not feel prepared to perform the PERSEIA"***

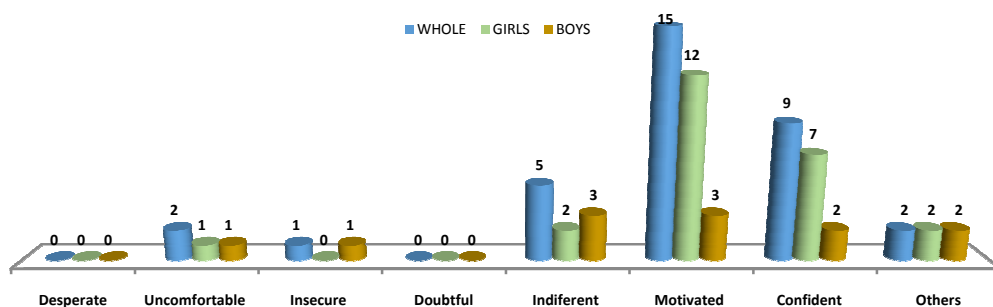
Exploring the reasons why students could have felt **not prepared for the PERSEIA**, they directly reported they did **not have enough sessions** to prepare the final PERSEIA (see above in Learning to Learn Skills Section).

However, despite of that, all the students reported they felt **"confident during the workshops"**, except 2 who reported negative answers and 2 a neutral answers. Students reported during the focus group that they really liked the workshops mostly because it was funny.



***"I felt confident during the workshops"***

This feeling was strengthen when asked students about **"how they felt during the workshops"**, as 15 of the 21 students reported they felt motivated and 9 reported having felt confident. **Positive feelings were especially reported among girls**, as half of them felt motivated (vs only 25% of the girls). Only 1 boy felt insecure and 2 students felt uncomfortable.



***"During the workshops, I felt:"***

Similar to the context settled in Vauréal, students' self-confidence improvement might have been largely **driven by the way facilitators led the exercises and the whole process**. Indeed, as developed earlier, facilitators had a benevolent behavior towards students. In that sense, they were attentive to students' demands and needs. Moreover, thanks to the **sharing of feelings about their own and also peers' performance** while realizing the different exercises and rehearsals, students could express their emotions. For instance, when students were uncomfortable with an exercise or did not know what they were supposed to do, they could express it easily, what was considered by the facilitators who provided them support. Such reactivity and attention from the facilitators enhanced the **climate of trust and confidence among students**.