



The Art of Science Learning

WP4 Assessment Analysis of Goal 2

French Case Study

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FRENCH CASE STUDY

GOAL 2: Creation of the PERSEIA

General Framework of the Analysis

As a way to highlight whether the project have reached the Goal 2, implying the *“performance’s capacity to combine rigorous scientific content with aesthetic quality”*, we explored both the scientific and artistic aspects of the final PERSEIA performed by students in both schools.

To do so, we first collected general information on the context of the performance of the PERSEIA, by considering where it took place, the number of students involved in the performance, and the public that attended the show. Then, we assessed the PERSEIA by considering: 1) **the artistic aspect** and 2) **the scientific content**.

The artistic aspects of the final PERSEIA (understood in the context of PERFORM, i.e. the educational project) included the consideration of: i) the **use of performing resources** (such as space, light, music and attrezzo); and ii) the inclusion of **artistic elements** that facilitators brought into the different workshops and that have been worked with the students all along the project. **Eight specific artistic elements** (identified as main aspects facilitators have been working with the students during the different workshops) have been explored: 1) to be conscious of the look and to maintain it, 2) to speak intelligibly; 3) to keep focused and calm; 4) to develop embodiment and body awareness; 5) to use corporal language; 6) to be conscious of the environment; 7) to memorize theatrical choreographic elements ; and 8) to develop a chorus work.

The assessment of the scientific content included: i) the **weight scientific content** took into the PERSEIA; ii) the **accuracy and rigour of the scientific content** transmitted during the PERSEIA, and iii) the **clarity of the communication** of such scientific content.

After the highlights and recommendations, we first present results on common aspects regarding the use of performing resources in the two schools, and then by group of students, we describe the context, and assess artistic elements and scientific content of the PERSEIAs played in each school.

Overall highlights and Recommendations

- ❖ Overall, the main strength of the final PERSEIA, for every group of both schools was **their artistic component and accomplishment. All the performing resources** available (stage, curtains, lights, music, attrezzo) **were used** in all the PERSEIA, in real or reproduced context of theatre. As well, a real attention was given to produce a final product that students might be proud of. The final PERSEIA allowed us to see that students have largely benefited from a process of artistic and performing skills learning, through a process of embodiment of the different aspects, as almost all of the students were able, even only after the realization of seven workshops of practice, to enter in their role-play.
- ❖ Another interesting and strong aspect of the PERSEIA relates to **the students' appropriation of their research question through embodiment**. In that sense, because most of the tasks and exercises realized in order to create the PERSEIA required students to integrate their research question with the body (by mimicry situation, emotions and ideas), the final **PERSEIA showed a representation of research questions and intellectual processes through the body**, what is totally out of schooling and academic way of communicating science. In that sense, PERSEIA communicated with other languages than the verbal pathway, by using performing resources and artistic elements to share and transmits ideas, feeling and emotions related to each of the different topics presented.
- ❖ Despite these important strengths, the **weight of the scientific content in the PERSEIA largely depended on the sketches performed**. Not all the sketches did allow understanding what was the scientific topic, research or data that were communicated.
- ❖ Many sketches showed students' research interests and topics but stayed at a **superficial level of description**. For many of them, the performance allowed students to present, by verbally saying their research questions, but without any more elements.
- ❖ In the same line, **although some sketches showed contrasting perspective** on a same topic, it occurred in **few sketches and the contrasts raised were somehow disconnected from the scientific content**.
- ❖ Such lack of scientific content **might be largely due to the approach developed for the PERSEIA, as most of the sketches were mostly raising questioning about the topics chosen by students** (illustrating somehow the different reasoning students went through during the workshops) **rather than bringing scientific answers and insights about the specific topic**.
- ❖ Despite of this interesting approach, **some sketches lacked of scientific accuracy** and transmitted **confusing elements that relied on common perceptions rather than scientific insights**.

Therefore, the final PERSEIA **hold a major artistic component that combined body, face and voice expressions to transmit messages and to communicate the topics students explored during the workshops**. Because the format used to develop the scenes favoured the use of body, picture, and artistic way of communicating rather than language, the **part dedicated to scientific explanation and reasoning was reduced in some sketches**. Moreover, because some sketches used the irony and exaggeration, this format somehow troubled the content of the message that wanted to be transmitted and did not allow identifying what was the scientific content.

In that sense, we highlight recommend:

- To maintain the format of communicating science as it relies being an innovative and creative way of communication, fostering the participation of all the students.
- The final PERSEIA to benefit of a **deeper work of research and integration of scientific content into the creation of the sketches**.
- To maintain the presentation of every students' research question in the content of the PERSEIA, especially if all the topics chosen by students are not developed in the scenes.
- To **complement the aspects that developed approach of students' reasoning process by integrating more scientific content**(implying thus more time for students to do research based on scientific resources)

Use of performing resources in both Vauréal and Marie Curie

As the performance of the PERSEIA in both schools relied on similar performance resources, we first present here the details of such resources.

Both facilitators thought the scenery and included different costumes and tools. For all the different scenes performed by students, they were holding different elements, such as glasses, wig, etc. Students performed their scenes in the stage created by Perform team, using the space offered.

Regarding the use of space, actors occupied the whole stage and chose different distributions depending on the scene and its requirements (focusing on one spot, spreading all over the stage, making a line...). There was a careful movement of the group, with the use of choreographies at some moments.

Regarding the use of music, all the scenes were accompanied by music, both to introduce scenes and to create different dramatic atmospheres within the sketches.

Regarding the use of lights, changing lights were used depending on the scene: different colours, different intensity and location, including the use of “noir” as well (black-out).

Regarding attrezzo: it was simple but carefully designed. All students were dressed in black and the different characters were differentiated by specific elements.

Collège Les Toupets - Vauréal

The PERSEIA was composed by the show of two groups, which performed one after the other, and lasted around 10 minutes each.

Context of performance

The performance took place in **real conditions of theatre show**: in the theatre of Vauréal, with all its layouts (seats, stage, curtains, etc.). The PERSEIA used all the resources at hand within the theatre setting (space, music, light and attrezzo).

More than 100 people went to attend to the final PERSEIA, including all the students belonging to the same schooling level classes of Vauréal's school, accompanied by several teachers.

Group 1

The first scene was performed by 9 students (5 girls and 4 boys) and **was composed by 4 different** sketches about 4 different topics: 1) Students' presentation of their research question (involving all the students); 2) Debate on conservation of the panda (involving all the students except one); 3) Archaeologists of the future (involving all the students); 4) Chorus on security in internet (involving all the students)

Description of the performance

Firstly, at the beginning of the show, in the first sketch, students arrive on the stage walking, and stop in different places of the stage. Some sit while others, (from one topic of research question) stay standing. The first are three girls who say their research question one after another (about conservation and endangered species). When finished, they sit, all the students stand up and several sit back while three students (from the group on future technologies) stay standing up. These three said their research question, they sit, and all the students stand up again, and sit back except the ones from the group on civility and society. They say their questions. All students stand up and leave the stage, except one girl.

The **second sketch** begins. Students are divided in two groups, aligned the one in front of the other. Two camps: the one in favour of protecting panda and the other opposed to panda conservation. During this debate, one after the others the students are saying arguments that emerged from the workshops. The sketch ends with the testimony of a girl about her child's life experience with a panda cuddly toy.

The **third sketch** begins with the entrance of four people holding a table as if they were in space. They carry the table, place it in the middle of the stage and go back to the backstage. They come back with other tools they place on the table (a car toy, an Ipad, a multi-socket adaptor). Then they go back to the backstage. Four other students enter on

the stage. They stand around the table and begin to look at the different tools and make comments about them, as if they were archaeologists in the 3000'. The sketch ends with a boy entering and saying that they are now using flying cars, explaining how they implement it. All the students come back to the backstage.

Finally, all the students enter on the stage for the **last sketch**; some hold white masks while other black masks. They stand in group, with two guys sit on their knees. As a chorus, they say multiple times two main sentences about internet and security: "*internet never forgets*" and "*anonymity*"

Assessment of the Artistic and Scientific Aspects of the performance

Artistic Elements: inclusion and use of performing resources

Overall, the 8 artistic elements identified by performers were present and observable, as students hold a different presence than their everyday's one.

Regarding students' regard and voice, almost all the students involved in the scene were able to directly look at the public, and to sustain their regard. They however gained in presence after the first sketch, during which it was visible that they were still anxious, as they were talking much more quickly than when rehearsing. At some points it was not really understandable. Then, except one girl who forgot her sentences and who was not speaking really intelligibly, all the others spoke clearly and loudly during the posterior sketches.

Regarding students' embodiment and their relation with others and the space, students were calm, concentrated and managed to embody their different roles. They were really synchronic and they reacted to each other speeches with fluency.

They all remember their text, except one at the beginning, despite being nervous, which suggested that they studied their sketches and that the rehearsal worked well.

Scientific content: weight, accuracy and rigour, and clarity of the communication

Scientific content was clearly communicated during the PERSEIA. Indeed, it was expressed and communicated through a first introductory sketch where students expressed the one after the other their own research question. This first sketch was followed by the performance of three different sketches, corresponding to the three main topics student's research questions: **conservation, society and citizenship, security on internet**.

In that sense, scientific content has been addressed through the main sketches related to the topics of student's research questions, by using the codes of theatre sketches, meaning that both real and scientific elements mixed with burlesque and absurd elements.

Overall, the scenes were not presenting results of investigation on student's different topics, but they rather highlighted the reasoning students realized in order to raise questioning.

Regarding the different sketches realized:

In the first one, students are playing a debate between pro and anti panda conservationists. One after the other, students from both sides are expressing arguments pro and anti panda conservation. While some arguments are embedded into real facts and reflections ("*Panda eats during 14h per day, 25 kg*"; "*they eat bamboo*"), other relate more on absurd and emotional reasons ("Panda are black and I don't like them because I am racist"; or "Panda are cute", or "Panda like to eat a lot, such as us, then we should like them").

Therefore, this debate presents **different ideas that emerged from both students' reflections** during the workshops and both **facilitators' investigations**. However, **it did not explore or highlight clearly the main reasons of panda conservation context**. In that sense, this debate does not clearly allow public to understand panda conservation status and related issues. In that sense, **the sketch lacked scientific accuracy**. It mostly explored **stereotypical reactions existing in the debate about endangered animals**. Furthermore, during the elaboration of this sketch, no time was devoted to sharing with students which of their ideas presented belonged to common stereotypes towards this issue and what belong to scientific aspects.

In sum, **scientific consistency has missed in this scene**, and at some point, **as the burlesque has been not clearly express or identified with students, it might cloud the message and the real issues of animal conservation**. In this sense, it might be questioned to which extent burlesque arguments (but embedded in public discourse such as "it is black, I don't like black, I don't want to protect it") would be considered as real and scientific for students. Indeed, some messages such as "why should we protect panda, there are several other more useful animal, such as bees..." would not allow students to understand the overall aim of protecting endangered animals.

In the second sketch, students were presenting to the audience three different tools: Ipad, multisocker adaptor and a car. One after the other, students were making comments about the aspect or characteristic of the object, as if they were archaeologists. Comments related to functioning, the fact of using electricity, of contaminating, of using adaptor... They were observations made by scientists. In that sense, this sketch **described a context of archaeology in the future and also shows some elements related to technology**, by highlighting how unfashionable our current tool will be in the future. At the end of the scene, a boy explains that in the future they get flying cars, expressing that at the beginning it was hard to implement but then now it is working and useful. For this explanation, the boy apparently did some research, but the explanation does not present any scientific facts that might relate to investigation.

Finally, **in the last sketch**, students repeat two main sentences: internet never forgets and there is no anonymity on internet. Reasons or argumentations justifying this are not presented in this scene but had been explored during the workshops.

Therefore, **scientific content could have been largely more explored than it has been**. Because the first sketch mixes burlesque and scientific arguments, it might have created confusion among students by not allowing them to have a clear and founded idea of conservation context and issues. Arguments and reasoning did not show deep research from students and were not really embodied by them. A more accurate reasoning and argumentation would have largely been improved by more research and reflection.

Group 2

The second scene was performed by 11 students (6 girls and 5 boys) and was composed by 7 different sketches assessing three main topics: 1) Optical illusion; 2) Brain functioning; and 3) the effects of the drugs on human body.

Description of the performance

In the **first sketch**, all the actors cross the stage and four of them stay in scene (2 girls and 2 boys); they find a position with a chair and freeze. Each of them shares a question;

The **second time** involves the same actors sitting on a row looking at the public. One of them, characterized as a girl, goes into the proscenium and shares a memory with her teddy-bear. She ran back and a journalist goes to proscenium and introduces a scientist, which enters into scene. He interviews him and the scientist talks in a weird Language

The **third sketch** showed actors in row looking at the public, they are given sparklers. Lights turn down and they move the sparklers, we can only see the light. Slowly the movement shows a message: S.O.S.

The **fourth sketch** involved two girls in front of each other, they perform a mirror (one actress reproduces the actions of the other). At a given point, they start to do different things. One engages in an out-of-control dance and the other one panics. The girl that is panicking screams and the movement ceases. Her friends enter in stage to see what happened to her and help her.

During the **fifth sketch**, all actors form a long row looking at the public. They intervene standing still, with their voices: they make questions about drugs;

The **sixth sketch** represented a metaphor of the brain, the different senses, and the role of neurotransmitters.

The **last sketch** shows the reaction of the brain when consuming drugs. The senses go crazy and neurotransmitters are lost. Fatigue comes and worsens the situation. Drug comes into stage; all actors want to catch it.

Assessment of the Artistic and Scientific Aspects of the performance

Artistic Elements: inclusion and use of performing resources

Students are focused on scene and a clear difference is observable between their presence in stage and their everyday presence/mood. Overall, the 8 artistic elements identified by performers are present and observable.

Regarding students' regard and voice, students looked at the public, and generally sustained their look (avoiding looking in other directions without a meaning). For instance, one of the actors –the journalist, who during the rehearsal sometimes looked at the back of the stage instead of the public, clearly corrected that and kept his look in the scientist and in the public. We can also hear the voice of most of them, there was a clear attention towards talking out loud enough and articulating.

Regarding students' embodiment and their relation with others and the space, they managed to control and modify their movement according to the scene, consciously changing the speed of their walk and the tempo of their bodies (for instance, in one scene there are two rhythms of walk: fast and slow; and at the beginning of the piece the actors enter with a specific cadence according to the mood of the scene). When they stood looking at the public, they paid attention at their bodies, e.g. their arms and hands hung around the body (avoiding crossing arms, for instance), they stood still (avoiding movements that were not part of the character) and some of them corrected themselves when they noticed they were missing something. This requires concentration and awareness. During the long row, most of the students were concentrated, avoiding faces and laughs (only one girl has difficulty and laughs a little). There is chorus work, especially in this part (in which they talk, following different sequences, they need to listen to each other) and in the brain and party scene, in which they must bear in mind each other's actions and not make the main actor (the drug) fall (they need to control their strength while also being effusive).

They all remembered their text, despite being nervous and excited, which suggests that they studied it and the rehearsal worked well.

Scientific content: weight, accuracy and rigour, and clarity of the communication

Regarding the illusions, the definition of the concept of illusion and exemplification through a visual composition combining body movement with lights. The visual scene contributed to communicating the concept. More content might have been communicated, but in terms of clarity what was shared was very clear. The content they provided **was accurately addressed**. Through their oral intervention in the first/second sketch, students provided the definition of an illusion ("*une perception déformée du sens*"). Then, through the scene with the scientist and the journalist that translates him, the piece briefly introduced the mechanism why it happens (related to the "*persistence rétinienne*"). There **is little content but it was accurate and focused**.

Regarding drugs, students **clearly defined the concept** of drug and identified two questions. *What are the effects of drogues in our brain? Why do people take drugs?* The first one was answered using theatrical images and metaphors created with the body to help understand the concepts. These techniques were applied in a very effective way: information was easy to understand and clearly communicated. Two girls played a "mirror", communicating what is outside and inside the person (outside: having fun; inside: losing control). In scene 6 they created a metaphor of the brain (different actors play different senses: area of touch, balance, coordination, look; other actors play neurotransmitters and show their functioning) to illustrate the effects of a drug on the brain. The drug activates the dopamine and neurotransmitters are confused, stop doing their work, then the fatigue comes and they stop working. The content they provide was **accurately addressed**. Students **provided a definition of drug** ("*a drug is a substance that modifies the brain activity*"); together with examples of a wide diversity of drugs (ecstasies, cocaine, cannabis, Tobacco, alcohol). They supported the oral information they provide with an embodied representation of the effects of drugs in the brain (answering the question: *What do drugs make on the brain?*).

Collège Marie Curie

The PERSEIA was composed by the show of two groups, which performed one after the other, and lasted around 10 minutes each.

Context of performance

Differently to Vauréal context, the **performance of the PERSEIA took place in the multipurpose room of Marie Curie's school**. Despite of this non optimal setting, and in order to create a context that mimics theatre's settings, facilitators arranged the whole room to create a stage, using black curtains, fixed music and light spots, and spectators' chairs.

However, the room was small and in that sense, the space available for the stage and the public was reduced. Almost 60 people attended the PERSEIA, including peers of PERFORM's students (from different class of the same schooling level), some teachers and few parents. Despite these constraints, facilitators used similar tools such as music, lights, curtains and students were wearing specific clothes and tools, as described in the introductory section of this document.

Group 1

The first scene was performed by 10 students (5 girls and 5 boys), including 2 boys who were not performing but rather helping the facilitators with logistical aspects (lights and music). It was composed by **6 different sketches**: 1) Students' presentation of their research questions (involving all the students); 2) Barnyard - Human to Animals Communication (involving all the students); 3) Animal to Human Communication (three girls); 4) Chorus on districts conflicts (involving all the students); 5) Impact of Social Networks on Adolescents (involving all the students); and 6) Girls/Boys friendships relationships (involving all the students).

Description of the performance

First, at the beginning of the show, in the first scene, students arrive on the stage walking, and stop in different places of the stage. Some sit while others, stay standing (two girls) who say their research question (related to animal-human relation). They say their research question one after another. When finished, they sit, all the students stand up and several sit back while three students stay standing up. These three say their research question, they sit, and all the students stand up again, and sit back except the ones who worked on sociological questions. They ask their questions. All students stand up and leave the stage.

The **second sketch** begins. One after the other, students in stage mimic animals, both in their movements and cries. One girl wearing a white coat and sunglasses enters on stage. She claps her hands all the animals stop. She presents that they investigate how human are talking to animals. All actors stand in front of the public. One begins mimicry gesture and sounds made when calling a horse. The other repeat the gesture and sound. Then the one after the other, actors mimic gestures and sounds made to call several animals. It ends with a boy calling his cat in Serbian. The others can't mimic it and leave the stage. The actress wearing white coat and sunglasses comes back and explain that, as seen, when humans are talking to animals, they become idiots.

The **third sketch** begins with the entering of another actress asking the scientific what she is doing. She asks her why she is wearing all these clothes, all the stereotypes of a scientific. "You don't need to wear all these things to be a scientific. She takes the white coat and glasses out and leaves the stage. The following scientific explains they will present their research on sign language learned by a monkey. A monkey and its owner enter into the stage. The scientist asks some questions to the monkey, to what the monkey answers only by obscene gestures. The scientist, uncomfortable, asks the owner to bring the monkey to its cage. Both leave. The scientist concludes saying that "as seen, animals totally know how to make them understand by human beings".

The **fourth sketch** begins with two groups of students entering from both sides of the stage. Wearing two different mask colours (black and white), they enter adopting aggressive attitudes. Student from one group begin to shout at the others with threatening gestures. Students from the other group answer adopting other menacing gestures. The other responds. A succession of several menacing gestures stops when one boy asks why they are fighting for. Another explains it was because the other group wanted to fight them. Students move and stand in front of the public, forming a line. A girl at the extremity of the line say "tell Hislem that her sister is waiting for him at Marcadet Poissonier" to her closer neighbour, asking him to report an info to a guy. This one repeats to another on his right, deforming the initial words, and the other make the same to a closest neighbour. The message goes from mouth to ears deforming. It arrives to the ears of the interested person, changed as "Hislem, the fisherman wants to fight you". The actress, who was embodying the scientist, says "it is not only when human are talking to the animals that they become idiots". The sketch ends with boys saying "why are we fighting thus?" and another one answering "if you watched La guerre des boutons, you understand all".

The **fifth sketch** begins with the entering of several actors who mimic a facebook profile page, by embodying different elements. Then, two of them stand with one wearing white coat. Suddenly another actress stands and asks them to take out their coats. They follow and explain that they conducted a survey among their peers in this school to understand what were the impacts of social media on the adolescents. A PowerPoint is used to present the graphics. Both actresses present the results on the different questions explored. One of them leaves the stage

The **sixth sketch** begins with the actress presenting the other research question they have explored. She leaves the stage. Three girls enter into the stage, mimicking postures of boys. Boys then enter mimic girls postures. Two actresses present the results of their research, for each question asked on their questionnaire. All the students leave the stage.

Assessment of the Artistic and Scientific Aspects of the performance

Artistic Elements: inclusion and use of performing resources

Overall, the eight artistic elements worked on during the workshops seemed to have been acquired by the students.

Regarding regard and voice, almost all the students could look directly at the public, without moving. During the first scene, students looked nervous and some of them were moving while saying their research question and other did not look at the public (especially boys). They got more concentrated afterwards, and were **speaking loudly and even for the most discreet**. Some students still showed difficulties to maintain their regard towards the public or to clearly articulate. For instance, during the sketches related to Social media and Friendships, the actresses who were presenting the results of their surveys had some troubles to say their speeches and hesitated at some points.

Regarding students' embodiment and their relation with other and the space, they were for most of them concentrated and managed to **embody their different roles**. Some of them were less comfortable with that as they were not looking directly at the public and were moving instead of staying quiet when standing up. It was challenging for some of them to stay calm and not to smile. During the different moments of chorus work, students managed to coordinate and be synchronic. There was not any problem in the following of the show, except on guy who entered from the wrong side of the stage.

In general, **students remembered well their text** (except one hesitation) and the movements they had to do. Because one hesitated and the public was laughing a lot in reading the results presented in the survey shown in the PowerPoint presentation, a teacher invited her to repeat what she was saying.

Scientific content: weight, accuracy and rigour, and clarity of the communication

Overall, scientific contents have been clearly communicated. As was the case in Vauréal, scientific content has been addressed in the context and using the codes of theatre sketches, meaning that both real and scientific elements mix with burlesque and absurd elements.

Scientific contents explored during the different workshops were expressed and communicated through first an introductory sketch where students express the one after the other their own research question and then through the performance of six different sketches, related to the four main topics student's research questions: Animal-Human Communications, Conflicts between districts, Impacts of Social Networks on Adolescents, and the Differences between Girls and Boys friendships relationships.

Scientific content is thus addressed through **six main sketches** related to the topics of student's research questions (relation with animals; conflicts; social media and friendships). Overall, the **quality and the approach of the scientific content depend on the topics**.

Regarding relation with animals, students introduced through oral interventions the research questions they explored and the visual scenes contributed to communicating the concept. The content communicated resulted on "*Animals are able (or not) to use sign language*"; and that "*humans become idiots when talking with Animals*". In that sense, the scene **lacked of scientific accuracy and scientific research**. It might have explored this specific

context, but it rather exposed few conclusions without explicitly saying that it is related or not to scientific research.

Regarding the conflicts between districts, after the illustration of the context with Chorus, students reproduced a grapevine, concluding it was the reason why conflicts existed. As well, this sketch mostly **reported potential facts and explanation of these situations of conflicts, which were successfully transmitted**. Because of the impossibility of exploring the real reasons of such conflicts, the sketch chose to present the way students reported the main causes of their existence. In that sense, this sketch reported the reasoning of students during the realization of the workshops, rather than a scientific content. However, it is worth reporting that such elements proposed as explanation of the conflicts were thought and debated during the workshops, with facilitators bringing broader overview and contextualizing.

Finally, regarding the two different **sociological questions**, students exposed their results, by using a PowerPoint presentation. They were explaining the different results of their surveys as in a conference context, what was also illustrated by metaphors of social media contexts and differentiate behaviours of girls and boys. In that sense, by using both theatrical pictures and a more classical way of transmitting academic knowledge, the scientific contents of these topics have been clearly communicate. Because of the demarche used to realize this survey, the scientific content was then accurately addressed. They **could provide insights coming from the people who were present in the public (as such surveys were realized among them) and shared with them their scientific reflection**.

Therefore, scientific content **has been explored as much as it could, considering the limitations of students' research questions**.

An effort to communicate about prejudices was made, allowing the public to understand that scientists do not necessarily wear glasses and white coat.

Some would have needed more research and accuracy, specifically for the sketches related to human-animals interactions, where the conclusions and insights brought stayed at the superficial level, presenting stereotypical behaviours but without scientific context. **More research and reflection might have been done in order to get a clearer and more accurate reasoning and argumentation**.

Group 2

The second scene was performed by 12 students (2 girls and 9 boys), with one boy assisting the facilitator with logistical aspects of the show. One guy who attended to the workshops did not participate and stayed as spectator.

It was composed by **4 different sketches**: 1) Students' presentation of their research question (involving all the students); Transition (one girl); 2) Archaeologists of the future (involving 3 students); 3) Chorus on Clone (all the students); Transition (one girl); 4) ET interview (4 girls).

Description of the performance

First sketch: all the students entered with chairs, stayed looking at the public without moving. The one after the other they are presenting some of their research question by asking at the end "*what will be our future?*" Students go out of the stage.

One girl enters with TV show music. She presents the show on futurology and invites what the scientists in the future might think about our current everyday tools.

Second sketch: Four students bring different tools on the stage. They are wearing white coat and glasses (with fluorescent lights). The one after the other, student takes one of the different objects present on the table and mimicry how they might use this object. They mimic using a shotgun as a blender, an I Phone as a razor, a car toy as gamepad etc. without saying a word. They stopped after several rounds and went off the stage. The sketch ends. The girl, presenter comes back on stage and explained that not only the objects would have evolved in 3017, but also humans.

In the third sketch, students are coming on stage by walking the one after the other, wearing the same black mask. In circle, looking the one at each other, students are doing the same gestures and movements. They stopped, stand in front the public and two groups of students come from both sides of the stage. They are clapping performing corporal percussion, and begin to say "Clonage, create a human being exactly similar" "clonage créer un être vivant absolument identique". The way students are saying it, it transmits a kind of oppressive atmosphere. They follow saying "un jumeau parfait", "une reproduction exacte", "2un double", "2absolument identique", and end by doing the gesture for asking silence. End. A new presenter enters on stage, TV Universe, saying that in the future maybe the cloning would be common.

Fourth sketch: the presenter introduces a future where we could meet Extraterrestrials, introducing a little girl able to talk with the ET and an ET. The presenter asks the girl from where comes the ET. The girl explains ET comes from another really far planet, gravitating around a star bigger than the sun. The presenter asks how they came on earth. The girl says they wanted some holidays, that their ships exploited and that they are looking for an alternative energy source. The presenter asks whether there is other ET like them. The girl explains there are a lot of different ET and that human are the only ones not to live in different planets. She talks about the diversity of ET. End of the sketch.

Assessment of the Artistic and Scientific Aspects of the performance

Artistic Elements: inclusion and use of performing resources

In general, students were much more concentrated than Group 1 and none of them laughed or smiled when performing, except one girl who hesitated at some time about what she had to say.

Regarding students' regard and voice, students looked at the public, and sustained their look (avoiding looking in other directions without a meaning).

Regarding students' embodiment and their relation with others and the space, They were overall focused, embodying their role without problem.

They all remembered their text, except one girl who had difficulty to speak and begin her speech, laughed a little while but came back to her text.

Scientific content: weight, accuracy and rigour, and clarity of the communication

Regarding the sketches related to archaeology in the future, as they stated, it could be understood the way researchers, and specifically archaeologists might explore the tools and ruins they are discovering. However, **although the sketch showed archaeologists, it did not explore or bring insights on the way such scientists are performing research**. It **rather raised questions about the future** and brought the possibility that our current domestic tools might have evolved and that what is common to us nowadays might be a real mystery for the future humans.

Regarding cloning, the way students **played this sketch illustrated what means cloning and what this could create**. It highlighted that it might be a potential evolution of human in the future. However, no more aspects were developed. In that sense, although students have explored this research question by embodying it, **it did not explore any scientific content and did not present any issues related to this issue**.

Regarding the aliens, the sketch presents the research question some of the students asked. It somehow raised questions related to this aspect, such as their origins, their way of living, of moving and whether aliens exist on other planets. However, as it states, the sketch transmitted there were a high diversity of aliens, living in several planets and that humans were the only ones to live in a unique planet. All these elements are **assumptions and do not rely on scientific insights**. In that sense, **as happened overall in the different scenes, such sketch raised questions on the topic but did not really bring any accurate content**.