



Report MATH.en.JEANS workshop
At Colegiul National Emil Racovita Cluj-Napoca
2014 – 2015

1. Enrolment

Students enrolled in October 2014 – the workshops have been advertised by the math teachers. At the end of October 2014, 72 students (31 male, 41 female) decided on their research team and research topics.

| Teacher | Number of students | Grade | Number of research topics |
|------------------------|--------------------|---------------|---------------------------|
| Ariana-Stanca Vacaretu | 5 | XII B | 2 |
| | 3 | X A | 1 |
| | 6 | IX A | 2 |
| Vasile Andrea | 12 | XII C & XII A | 4 |
| | 12 | XI C | 5 |
| | 11 | X C | 4 |
| Valentina Vasilescu | 6 | IX B | 2 |
| Alexandrina Cruceru | 9 | IX C | 3 |
| Adrian Magdas | 9 | XI A | 3 |

2. The weekly meetings

During the period end of October – end of March, the teachers organized weekly meetings for facilitating the students work on the research topics.

During November, 15 students from the 12th grade (12 students from XII C & A and 3 students from XII B) quitted the workshop because of time restrictions (they had to prepare for the final exam + many of them applied to foreign universities and had to prepare for and participate in interviews). Unfortunately, only the 12th B graders announced that they decided to quit the MeJ workshop. One students from the IX A grade quitted the school.

| Teacher | Number of weekly meetings | Number of students (we didn't considered the students who quitted) | Number of hours (nr of meetings x number of students) | Number of hours the students participated in the meetings | Students' attendance (%) |
|------------------------|---------------------------|--|---|---|--------------------------|
| Ariana-Stanca Vacaretu | 17 | 10 | 170 | 124 | 73% |
| Vasile Andrea | 9 | 23 | 207 | 144 | 70% |





| Teacher | Number of weekly meetings | Number of students (we didn't considered the students who quitted) | Number of hours (nr of meetings x number of students) | Number of hours the students participated in the meetings | Students' attendance (%) |
|---------------------|---------------------------|--|---|---|--------------------------|
| Valentina Vasilescu | 14 | 6 | 84 | 66 | 79% |
| Alexandrina Cruceru | 16 | 9 | 144 | 103 | 72% |
| Adrian Magdas | 3 | 9 | 27 | 27 | 100% |
| Total | | 57 | 632 | 464 | 73% |

3. The video conferences

We have organized 4 video-conference between FR and RO students – each video-conference has been topic to certain topics.

| Date | Topics discussed | RO Students participation (in numbers) | RO Students participation (%) |
|------------|--|---|-------------------------------|
| 19.11.2014 | La fougère et La modélisation de croissance des végétaux | 19 students (grades XII B, IX A, X C, XI C, XII C, XII A, IX B, XI A) – out of 23 | 83% |
| 19.11.2014 | La roue de vélo | 4 students (X a, XI C) out of 6 | 67% |
| 10.12.2014 | Paradoxe du Braess | 5 students (IX A, XI C) - out of 15 | 33% |
| 10.12.2014 | Mancala | 5 students (IX B, XI C) – out of 6 | 83% |
| 11.02.2015 | La compression d'une image | 8 students (X C, XI C, IX C) – out of 11 | 73% |
| 11.02.2015 | La roue de vélo | 3 students (X A, XI C) – out of 7 | 43% |
| 11.03.2015 | Marathon, Athlétisme | 5 students (XI C, XI A) – out of 9 | 56% |
| 11.03.2015 | Datation au lichen | 0 students out of 3 | 0% |





4. The math forum

On the 20th of March 2015, we have organized the math forum in our school. In the forum, 37 MeJ students presented their research results to their colleagues.

| Teacher | Number of students | Grade | Research topic |
|---------------------------|--------------------|-------|--|
| Ariana-Stanca Vacaretu | 2 | X A | Roue de vélo |
| | 2 | XII B | La fougère |
| | 4 | IX A | Paradoxe de Braess Modélisation de la croissance de végétaux |
| Vasile Andrea | 9 | XI C | Compression d'une image Mancala Paradoxe de Braess Roue de vélo La fougère |
| Valentina Vasilescu | 6 | IX B | Mancala La fougère |
| Alexandrina Cruceru | 8 | IX C | Compression d'une image Paradoxe de Braess Marathon |
| Adrian Magdas | 6 | XI A | Modélisation de la croissance de végétaux Marathon |

Remark: On the 20th of May 2015, we have organised a Math Youth Forum for high-students and teachers from our city. The RO students shared their work and research results with 47 high-school students and math teachers from other nine high-schools from our city. However, we consider this Forum a dissemination activity and not a MeJ workshop activity.

5. The Avignon Congress

On 26 – 28 March 2015, 12 students from CNER participated in the Avignon Congress. All of them presented their research results, together with their French colleagues, in both, the Forum and in the presentation sessions.

| Teacher | Number of students | Grade | Research topic |
|---------------------------|--------------------|-------|--|
| Ariana-Stanca Vacaretu | 2 | XII B | La fougère |
| | 1 | X A | Roue de vélo |
| Vasile Andrea | 9 | XI C | Compression d'une image Mancala Paradoxe de Braess Roue de vélo La fougère |





6. The research articles

During April and May 2015, students elaborated the research articles. 34 students wrote 13 research articles, which will be used for the elaboration of the common FR-RO research articles. The articles will be validated by the professional researchers.

| Students | Grade | Article |
|---|-------------|-------------------------------------|
| Matei Papahagi Raluca Roman | IX A | Iterative structures in nature (EN) |
| Diana Coroiu Vlad Sebastian Lupescu | IX A | Paradoxe de Braess (EN) |
| Victor Motogna Meda Muresan Mihai Chindris | XII B | The creation of the fern (EN) |
| Cristiana Horea Iulia-Mara Magdau Iulia Cioban | X A XI C | La roue de vélo (FR) |
| Antonia Curta Mara Coruțiu Lorena Mîrza | IX B | La fougère (FR) |
| Iulia Revnic Radu Radoi Ioana Ciceo | IX B | Mancala (FR) |
| Maria Craciun Iulia Rebreanu Alexandra Timoce | X C | La fougère (FR) |
| Alexandra Maior Sara Boancă Uliana Palade | XI C | La fougère (FR) |
| Mihnea Cuibus Andrei Ile Catalina Rete | XI C | Le jeu de Mancala (FR) |
| Mihnea Cuibus Andrei Ile Catalina Rete | XI C | Le Paradoxe de Braess (FR) |
| Claudiu Mihali Andreea Sabadîș David Opruța | XI C | Compression d'une image (FR) |
| Cristian Chisiu Maria Gyorgy-Spiridon Gavris Vancea | IX C | Marathon (EN) |
| Andrei Filp Darius Loga Mihai Tofan | IX C | The compression of an image (EN) |





7. Collaboration with the researcher

The researcher (drd. Adela Lupescu, from the Babes-Bolyai University) participated in the workshop meetings facilitated by Ariana-Stanca Vacaretu and also in both, the meetings for preparing the students participation in the Avignon Congress and video conferences between the FR-RO students. She also read and gave feedback on the RO students' research articles.

8. Conclusions

8.1. Strengths

- Students worked well in their groups.
- Collaboration with other students (the FR students) who research the same topic supported the students in their work.
- Different ways of approaching the same topic develops the mathematical thinking.

8.2. Weaknesses

- Communication with other RO students (facilitated by a different teacher) on the research topic missed. RO students exchanged ideas when they met for the video-conferences or in the Math Forum.
- Communication with FR students happened mainly during the video-conferences, during the C1 exchange and in the Avignon Congress.
- Some students changed the members of their groups or changed the research topic (during November, after starting the weekly meetings).
- Some of the students didn't announce the teacher about their decision to quit the workshop. This was an issue, especially when organising the video-conferences.
- Some of the RO students who didn't participate in the Avignon Congress weren't motivated to continue their research – they have no opportunity to present their work outside the school.

8.3. Proposals for improvement

- We should try to organise meetings with RO students researching the same topic – at least, 1 meeting/ topic. During the meeting students should share their work and give feedback. In this meeting, the researcher should participate, give feedback and discuss with all the RO students.
- Students who already have experience in participating in MeJ should share their experience with 'new-comers' (if they are asked to).
- We should try to organise a Math Forum for RO students from other schools (and our school) who are involved in MeJ.

