

DRONE



STEAM

DRONES@STEAM

Fostering digital Transformation in VET schools and creating new job prospects in the labour market

Questionnaires Report

Country: FRANCE

Partner (s):



CONTEXT

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Introduction

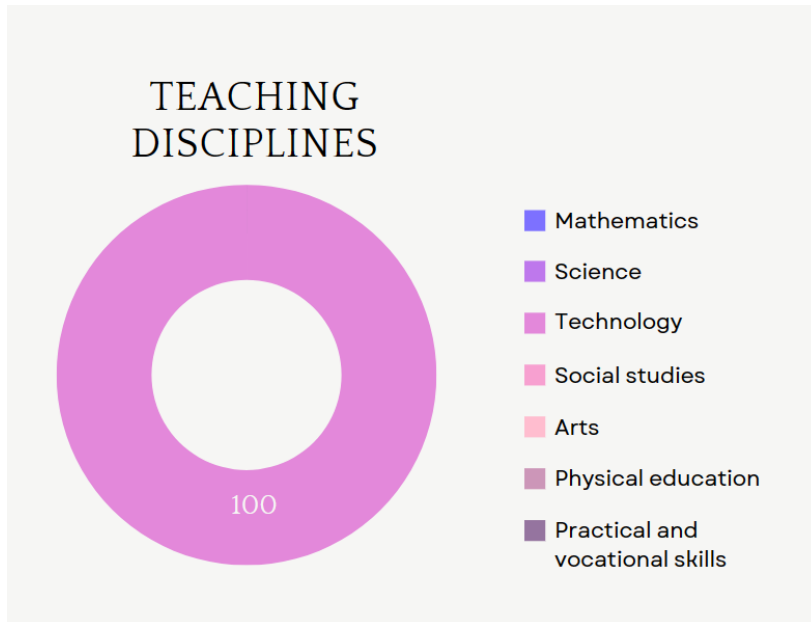
The questionnaires were carried out by the team of the Creative Lab TRANSENE by ECAM EPMI within its premises in Les Mureaux in connection with local partner institutions (educators) and young people in schooling within these same institutions.

We launched the solicitations to the people who participated in the questionnaires around the start of the school year, all these solicited persons responded positively to participate in this project, nevertheless the lack of availability on the same dates meant that we had been forced to organize several working groups on different dates, with 5 educators / teacher-researchers and 5 students.

TEACHERS QUESTIONNAIRE RESULTS

Teaching disciplines

All teachers practice in the technology sector



Age range of your students

The age of students ranged from 15 to 21: High school and graduate students.

How do you rate your knowledge in STEAM subjects?

4 educators felt they had enough knowledge about steam subjects and therefore answered 4 , and only 1 educator answered 3.

How do you rate your level of updating concerning STEAM Teaching methods?

4 educators answered 4 and only one educator answered 3.

Based on your experience, which is the best method to teach STEAM subjects?

All educators were unanimous about the second response With the support of technological tools and only two added during steam labs hours.

Which STEAM subject is the most appreciated by your students?

All educators were unanimous about Technology subject two of them added Engineering and only one added Science.

Do you think that the use of technological tools during teaching hours is useful?

All educators answered yes to this question.

To what extent do you use the following aspects of teaching and learning (with or without ICT) when teaching this class?

All participants unanimously answered this question with the following common answer: they use different types of materials (visual, audio, written) in their classes.

4 of them confirmed presenting and explaining scientific ideas to the whole class, demonstrating a scientific idea to the whole class and pushing students to discuss ideas with other students and the teacher, they also work collaboratively, to find solutions to problems by working in groups, with well-defined tasks but their Students can work on exercises or tasks individually at the same time, these same 4 participants agreed that their students conduct experiments

3 of them also said to give feedback to their students during a learning activity, this allows them to evaluate in real time the involvement of each one during the sessions.

They also confirmed that following the request of their students it also happens to them to support and explain things to individual students.

and 2 educators revealed the presence of the sense of autonomy that some of their students have shown, so they conduct their own scientific study and research activities.

Have you ever notice differences between teaching with or without technological tools by your students?

All participants answered yes to this question.

If yes, which ones?

All educators answered motivation, better general skills and better transversal skills, all answered performance also except one educator who did not choose this answer.

Which learning resources / materials are you currently using when teaching this class?

All participants answered Paper-based materials and Audio/video materials, 4 of them added robots and sensors, data loggers, Presentations (MS Power Point, Libre Office Impress, Sway...) and Manipulation in an experimental lab, and 3 answered Word processors (e.g. MS Word, LibreOffice Write, OneNote, Notepad...), 4 of them added robots and sensors, data loggers, Presentations (MS Power Point, Libre Office Impress, Sway...)

and Manipulation in an experimental lab, and 3 answered Word processors (e.g. MS Word, LibreOffice Write, OneNote, Notepad...), two of them added Resources for special needs learners Resources for personalised learning and only one participant had added Data sets / Spreadsheets (MS Excel, Libre Office Calc,...) and Online collaborative tools (Padlet, Mentimeter, Tricider, Kahoot...)

Which pedagogical approaches are you using in your STEAM teaching

All participants answered unanimously: Teaching with experiments (experiments are used in the classroom to explain the subject matter), 4 of them confirmed that they still work with the traditional method and therefore answered the first choice : *Traditional direct instruction* (lessons are focused on the delivery of content by the teacher and the acquisition of content knowledge by the students).

1 teacher added Project-/Problem-based approach (students are engaged in learning through the investigation of real-world challenges and problems), *Summative assessment* (student learning is evaluated at the end of an instructional unit and compared against a benchmark or standard).and *Formative assessment, including self-assessment* (student learning is constantly monitored and ongoing feedback is provided; students are provided with opportunities to reflect on their own learning) and only one teacher had added *Personalised learning* (teaching and learning are tailored to meet students' individual interests and aspirations as well as their learning needs).

How do you rate your school's infrastructure?

The 3 teachers at Vaucanson High School answered 2 to this question The other two teachers answered 4.

How do you rate your school's labs?

Same as the previous question: The three teachers at Vaucanson High School answered 2 to this question the other two teachers answered 4.

How do you rate the level of the technological tools available in your school?

3 participants answered 2 one participant answered 3 and the last one answered 4.

Is your use of STEM teaching affected by the following?

2 participants complained about the lack of computers in their labs so they responded: Insufficient number of computers, 3 participants answered Insufficient technical support for teachers ,2 answered Insufficient pedagogical support for teachers, Insufficient number of Internet-connected computers and Insufficient Internet bandwidth or speed,1 of them added School space organisation (classroom size and furniture, etc.) and Budget constraints in accessing adequate content/material for teaching.

Is a 3D printer available at your school? If yes, specify how many?

All participants answered yes to this question, 3 others would have at least 1 printer in their institution the other two answered more than 2..

Is a drone available in your school? If yes, specify how many?

Same as the previous question: All participants answered yes to this question, 3 others would have at least 1 printer in their institution the other two answered more than 2..

Do you have any experience with 3D printers?

3 participants answered yes and the other 2 say they have not had the opportunity to experience 3D printing.

Do you have any experience with drones?

2 participants answered yes the other 3 answered no.

Would you be willing to spend time in an extra-curricular project?

All participants confirmed their willingness to devote time to projects extracurricular despite lack of time for some.

If yes, how many hours per week would you be willing to dedicate to the project?

4 participants answered to be able to devote 2 hours to this project, the 5th answered one hour only given his very busy schedule.

Please specify the importance of the following in relation to the use of drones in education

All participants are unanimous on the importance of engineering skills and assembly in the education system regarding drone technologies, the Most also responded to the Piloting and programming.

Any other suggestions or anything else you would like to comment on? (open question)

The participants showed their interest in this project, they indeed mentioned the lack of investment of their institution concerning the involvement of these technologies in teaching; they are very interested and curious to learn a little more about our project and think it is important to show students the potential behind these technologies and the trades that result from them.

STUDENTS QUESTIONNAIRE

Age The participants are aged between 16 and 21, two high school students aged 16 and 17, an engineering school student aged 21 and two girls in reconversion aged over 18

Gender 3 boys and 2 girls

Preferred studies area

To this question 4 participants answered to be interested in Engineering (mechanical/electrical/ship/aeronautics) , 3 responded Science education (physics, chemistry, biology and ecology) , 2 responded Language education and communication , Specific vocational education came up twice in the responses , 1 participant also added Mathematical education , and Education for health (including physical education).

Do you know the meaning of the acronym STEAM?

3 answered yes to this question and 2 said they did not know what it is.

Are you interested in STEAM (Science, Technology, Engineering, Art and Math) Subjects?

2 answered 5 to this question, 2 participants confirmed their interest by answering 4 and only one participant answered 3.

Are you interested in a future job that deal with STEAM subjects?

One participant said he was very interested in these trades and therefore answered 5 , 2 answered 4 and , 2 answered 3.

If yes, please present the jobs the students are interested in

The votes were as follows : 4 Engineers, 1 Scientists,1 Statisticians, 2 Architects,1 Computer Technicians,1 Manufacturing Technologists, 1 Health Care Professionals, 2 Machinists.

How do they rate their knowledge about STEAM (Science, Technology, Engineering, Art and Math) subject?

2 participants feel they have good knowledge so answered 4, 1 participant answered 3 medium level, and two participants feel they do not have the level but wish to learn so answered 2.

Which aspect of STEAM (Science, Technology, Engineering, Art and Math) subject would they like to improve?

4 participants responded Engineering , 3 answered Technology , 2 participants voted sciences 1 replied being interested in Math and 1 answered Art.

Interest in 3d Printing

All participants said they were very interested in 3D printing.

Use of a 3D printer

All participants confirm that they have already used a 3D printer at least once.

Interest in Drone Piloting

All participants said they were very interested in drone piloting.

Have they piloted a Drone before?

All participants answered yes except one.

Importance of the following in relation to the use of drones in education

All participants are unanimous on the importance of engineering skills and assembly in the education system regarding drone technologies, the Most also responded to the Piloting and programming, these same participants think that creativity is not essential.

After-school time in a STEAM lab

All participants confirmed their willingness to devote time to projects extracurricular despite lack of time for some.

Enough free time to spend for an after-school time's lab

All participants are unanimous about the lack of time they can spend in the labs so the answer was no.

Does the school have spaces (for example: outside yard, a big gathering room) for drone piloting?

All participants answered no except one participant.

Does the school have 3d printers

The answer was unanimous: Yes .

Does the school have drones

3 participants answered yes and 2 answered with negation.

Any other suggestions or comments

Some of our participants are part of our interns (Students in Bac Pro at Vaucanson High School) within the Creative Lab so they asked to be involved in the technical part of the project so that they can better understand the subject and thus contribute to the realization of this project.