SURVEY ON LEARNING NEEDS FINDINGS

Demetris Mylonas

Overview of the survey

- Targeted students, teachers and stakeholders through 3 specially designed online questionnaires in EN, translated project languages
- Implementation period: February-May 2023
- Responses: 457 students (113 IT, 77 HR, 238 GR, 29 IL), 61 teachers (23 IT, 24 HR, 14 GR), 56 stakeholders (19 IT, 12 HR, 16 GR, 3 IL, 6 MCE)
- Survey schools:
  - Liceo Classico Galileo, IIS Peano – Italy
  - High School for Electrical Engineering and Computing – Croatia
  - 2nd Gymnasium of Glyfada – Greece
  - Holtz High School - Israel

Structure of survey form – students and teachers

- Profile
- Knowledge
- Skills
- Interests, perceptions, attitudes

Findings of students' survey

PROFILE

- Students from Croatia and Israel predominantly male
- Younger Greek students (13-14 years old), Italian and Israeli (14-15 years old), Croatian students (15-16 years old)
- Italian and Greek students mainly follow general education
- Croatian students strongly oriented towards electrical engineering-computing
- Israeli students oriented towards aviation/engineering fields

Findings of students' survey

KNOWLEDGE

- Water management: Italian students generally report better knowledge levels.
- Waste management: Good knowledge levels on Recycling, Responsible Consumers' Behaviour, Pollution from Uncontrolled Dumping. Poor knowledge on waste disposal methods.
- Energy management: Good levels of knowledge on renewable energy sources, moderate on energy production by fossil fuels and energy efficiency. Poor knowledge on energy security.
- Urban transport management: Good levels of knowledge overall, Italian and Greek students indicate slightly higher knowledge levels.
- Terminology: Great differences from country to country. Italian students indicate higher knowledge levels, Croatian students follow. Greek and Israeli students report the greatest knowledge gaps on terminology suggested.

Findings of students' survey

Relation to school subjects

- Geography and Science subjects (Biology, Physics, Chemistry) are seen as most relevant
- History is seen as moderately relevant
- Math, Literature, Art and English are seen as subjects with very limited connection
- Italian students indicate stronger connection to Information Technology
- Greek students indicate strong connection to Civic Education
- Croatian students indicate strong connection of vocational subjects to energy management
- Urban transport management is seen as the least relevant theme to the school subjects

Findings of students' survey

Skills

- Italian, Croatian and Israeli students report a lack of experience in fieldwork, using video-making software, using art to communicate ideas.
- Greek students report lack of experience in using online/mobile applications for learning.
- Most students have no experience in collaborating with external experts and/or foreign students.

Findings of students' survey

Interest, attitudes

- Lack of interest of Croatian and Israeli students on themes, except energy management
- Stronger interest of Italian and Greek students to methods proposed (e.g. project work, fieldwork, hands on activities, etc.), less interest among Croatian and Israeli students.
- Most Greek, Croatian and Israeli students not interested in collaborating with foreign students. Italian students report the opposite.
- Most students express positive attitudes towards central concepts (sustainability, fight against climate change, etc.) – 20-30% express lower awareness levels.

Findings of students' survey

Interest, attitudes

- Italian and Greek students more comfortable with Science, Humanities, Art and Math
- Croatian and Israeli students more comfortable with Technology and Engineering
- Gender analysis of the older Italian students yields statistically significant findings: male students more positive attitude towards Technology and Engineering, female students more positive on Humanities
- Croatian and Israeli students have visited proposed facilities (water treatment, recycling plant, renewable energy plant) more than Italian and Greek students

Findings of teachers' survey

PROFILE

- Most Italian and Greek teachers female and with longer teaching experience, most Croatian male
- Great majority of Italian and Greek teachers are specialised in Language/Literature and Math, most Croatian teachers are specialised in IT, Electrical Engineering, Language/Literature

Findings of teachers' survey

KNOWLEDGE

- Water management: Greek teachers overall report higher knowledge levels. Variations between countries on different topics suggested.
- Waste management: Teachers report good knowledge, however know less about waste disposal methods.
- Energy management: Poorer knowledge overall. Renewable energy sources and Efficient use of energy by consumers are more familiar than Energy production from fossil fuels.
- Urban transport management: Italian and Greek teachers report higher levels of knowledge.
- Terminology: Teachers are familiar with widely known terms like “climate change”, “biodiversity” and “greenhouse gas emissions”. Less familiar with terms like “water treatment”, “energy efficiency”, circular economy”, “sustainable urban mobility”. “Carbon footprint” and “Virtual water” are unknown terms.

Findings of teachers' survey

Relation to school subjects

- Italian and Croatian teachers see some relation of the ECOSTEAM themes to all school subjects proposed.
- Greek teachers do not see any relation to Art, History and English (foreign language), and some do not see a relation to any school subject.

Findings of teachers' survey

Experience with STEAM, IBL, PBL learning approaches

- Croatian and Greek teachers are more familiar with the meaning and application of STEAM. Croatian teachers have also implementation experience, although they report that it faces many limitations in the school.
- Positive attitude towards STEAM – especially Croatian teachers.
- Greek and Croatian teachers have implemented and report a positive attitude towards IBL and PBL.
- However, most teachers in all countries agree that they should be better prepared to collaborate amongst them and participate in PBL.
- Italian teachers are the least experienced with STEAM, IBL and PBL.
- Limitations in implementation: knowledge gaps about the methodology, lack of time, problems of integration into the national school programmes.

Findings of teachers' survey

Skills

- Teachers are experienced in guiding their students to work in teams, do research, keep to deadlines and communicate opinions and ideas.
- Italian teachers have experience in collaborating with fellow teachers from other disciplines on one common project.
- Teachers in general are not familiar with using smartphones/tablets in education.

Findings of teachers' survey

Interest, attitudes

- Vast majority of teachers in all countries are interested in the main project themes.
- Teachers generally interested in all 4 themes with regard to their town.
- Great interest in working on a school project with experts, performing outdoor activities, and connecting science subjects with other subjects at school. Less interest in instructing the students in using mobile applications and presenting their findings to a wider audience.

Findings of teachers' survey

Interest, attitudes

- Very positive attitudes on environmental issues, adopting a responsible and active approach as citizen.
- Mainly Croatian teachers enjoy using mobile devices and believe in integrating new technologies in school education.
- Most teachers like working as a member of a team.
- Croatian teachers have visited related facilities more frequently (e.g. water treatment plants, renewable energy plant, etc.)
- Italian teachers leave their car at home when going to school.

Structure of survey form – stakeholders

- Organisation profile
- Experience with school education
- Educational resources available
- Interest in collaborating with schools, participating in the project

Findings of stakeholders' survey

PROFILE

- Mainly public organisations
- Local authorities, public utility companies, NGOs
- Main fields of interest:
  - Water management in Italy and Israel
  - Waste management in Greece
  - Environmental protection in Croatia, Israel and the MCE network
  - Urban mobility in MCE network

Findings of stakeholders' survey

EXPERIENCE IN SCHOOL EDUCATION

- Majority of stakeholders in all countries have experience in school education (ranges from 95% in Italy to 50% in Greece)
- Primary and secondary school education, also higher education
- Israeli respondents report most frequent collaboration with schools. Italian and Croatian stakeholders follow. Greek stakeholders and stakeholders in the MCE network collaborate with schools mainly on an occasional basis.
- Mainly educational projects (Italy, Croatia, Israel, MCE), educational visits at the schools (Greece, Italy), study visits of schools (Greece, Italy, Israel), few offer training courses for teachers (Croatia, Greece, Italy, Israel).
- Mainly Greek, Croatian and MCE stakeholders involve students/teachers as volunteers.

Findings of stakeholders' survey

EXAMPLES OF EDUCATIONAL ACTIVITIES

- "Environmental sustainability of the food chain", "Urban water and waste management", "Water purification, composting" (Italy)
- "Renewable energy sources, sustainable development, stem education…, social impact, CO_2 footprint…", "Sustainable development", "Water sampling, technical components of public water supply and public drainage, preservation of water resources and environmental protection" (Croatia)
- "Circular Economy, Ecologic Agriculture, Environmental education with 3D printing", "Energy topics, Waste management", "Waste management, Recycling plastic, recycling clothing, Reuse" (Greece)
- "Everything related to STEM", "reuse, recycling, sewage treatment, water desalination, renewable energy, preserving the sea and nature and dealing with climate changes" (Israel)
- "Environmental and social problems, European citizens' awareness and sense of co- responsibility of individual and collective behaviour towards the interdependence and intersectionality of ecological crises, non-formal education programs", "Traffic management system" (MCE)

Findings of stakeholders' survey

Educational resources developed

- Most stakeholder organisations have not developed own learning resources.
- Sustainable waste management, water management, energy production and management, urban mobility.
- Mainly available in national languages.

Findings of stakeholders' survey

Interest

- Interest in collaborating with schools in the field of sustainable urban management
- Positive in contributing to the learning process in schools
- School programmes should include sustainable urban management themes
- Willingness to contribute as experts – would like to receive more information

CONCLUSIONS
-
POINTS FOR DISCUSSION

- Knowledge levels on the ECOSTEAM themes vary from country to country and may be connected to schools' profile and prior experience. We should not assume prior knowledge on topics/terminology. Creating a glossary with terms' definitions should be considered.
- The connection of different school subjects to the proposed ECOSTEAM STEAM framework is not clear. The role of school subjects should be clearly elaborated.
- The experience of students and teachers on methodological aspects varies, according to the specific national frameworks and schools' profiles. Teachers need support (theoretical background) and guidance through a flexible approach.
- The interest of students following more focused / specialised studies is limited to their specific fields of study. Same applies to methodological aspects proposed. How can we stimulate their interest?

CONCLUSIONS - POINTS FOR DISCUSSION

- Greek, Croatian and Israeli students not so keen on collaborating with foreign students. Language barrier? Lack of similar experience?
- Positive attitudes on central concepts and methodological approaches by students in all countries, contradict (?) the lower interest recorded among Israeli and Croatian students.
- The correlation between gender and certain STEAM disciplines in older students must be considered.
- Stakeholders have experience in school education, are willing to contribute and have a positive collaboration attitude. However, only a few have developed learning resources…

THANK YOU