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SURVEY ASSESSING KNOWLEDGE, SKILLS, INTERESTS AND ATTITUDES OF SECONDARY EDUCATION
STUDENTS AND TEACHERS, RELATED TO THE THEMES OF THE PROJECT

EXECUTIVE REPORT OF FINDINGS

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This Executive Summary was carried out under the frame of the Erasmus+ project: “GOODFOOD – Education to become responsible food consumers”. The main aims of this project are: 1) to raise awareness on sustainable and responsible food consumption taking into account the food cycle environmental impacts and the need for a balanced and healthy diet, and 2) to make school and STEM more effective and attractive to the students of secondary education by implementing a learning methodology based on STEAM and IBL (Inquiry-Based Learning) approaches. This Executive Summary presents the main findings attained through a survey to the students and teachers from three separate schools in Spain¹, Italy² and Greece³ in May 2022. The objective of the survey was to chart the current knowledge, skills, interests and attitudes of secondary education students in relation to the themes proposed by the project, i.e. sustainable food production, sustainable food consumption, and balanced and healthy diet. The survey also aimed at identifying the students’ perception towards the different disciplines brought together in the STEAM approach (i.e. Science, Technology, Engineering, Art and Math), as well as regarding the relation of the project themes to subjects taught at school. Finally, the survey also drew on the teachers’ attitudes, perceptions and existing knowledge and skills related to the educational approaches proposed by the project and the project themes.

The survey was implemented through a specially designed questionnaire that was administered online to secondary education students and teachers at the participating schools. The detailed results and findings of the learning needs survey in Spain, Italy and Greece can be found in the corresponding National Reports available at the project website in the following links:

<https://goodfoodeplus.cebas.csic.es/wp-content/uploads/2022/09/Survey-report-in-Spain.pdf>

<https://goodfoodeplus.cebas.csic.es/wp-content/uploads/2022/09/Survey-report-in-Italy.pdf>

<https://goodfoodeplus.cebas.csic.es/wp-content/uploads/2022/09/Survey-report-in-Greece.pdf>

Nevertheless, the main outcomes of the survey conducted with students and teachers of secondary schools in the three project countries – Spain, Italy and Greece – are summarized below.

The secondary education context in the three countries

A review of the secondary education in the three countries reveals **similarities and differences** in terms of structure, school subjects taught, the integration of project work, and the level of school autonomy. The Spanish secondary education structure differs from the Italian and the Greek, in that it consists of 2 compulsory cycles for students of younger ages (between 12 and 16), while the Italian and Greek systems include a compulsory lower secondary education cycle and a non-compulsory upper secondary education cycle, for students of a wider age range (11-12 to 18-19). Regarding the subjects taught, although a group of core standard subjects related to the GOODFOOD STEAM approach are taught in all three secondary education systems (i.e. Maths, Physics, Chemistry, Biology/Geology, Information Technology, Geography, Literature, History and Foreign Languages - English), there are also additional subjects like Civic Education taught in Italian and Greek schools, and Arts may be optional (Spain) or not included in the curriculum (upper secondary schools in Greece).

¹ The Spanish survey was conducted among students and teachers of the Institute for Secondary Education ‘Monte Miravete’, Torreagüera, Murcia.

² The Italian survey was conducted among students and teachers of the Elsa Morante – Conti Ginori Environmental Technical High School in Florence, and the Scientific Lyceum N. Copernico (High School) in Prato.

³ The Greek survey was conducted among students and teachers of the 1st Lyceum of Rafina.

Also, project work is integrated into the curricula of Italian and Spanish schools but is not included in the Greek schools' curriculum. The level of autonomy of schools also differs; Italian and Spanish schools are more autonomous than the Greek schools in terms of developing and implementing learning activities. Finally, in all project countries there is a lack of experience in terms of collaboration between teachers from different disciplines.

The differences identified in the secondary education context of the three countries in terms of structure, school subjects, the integration of project work and the level of autonomy of schools, suggest the development of a learning methodology that is **flexible and can easily be adapted** to suit the local needs and context of formal secondary education in different countries.

Current knowledge on the GOODFOOD themes

The survey results regarding the participants' knowledge on central GOODFOOD themes like healthy diet, sustainable food production and sustainable diet, indicate that although the participating students and teachers generally demonstrated a good level of knowledge, there are gaps of knowledge that need to be tackled.

The **connection of the Mediterranean Diet** with food types such as meat, cereals, dairies, red sauce or red wine appear to be, in general, less clear as suggested by the variation and small differences between the responses of students from country to country. Although it is possible that these differences might be partially attributed to differences between each country's traditional cuisine, we cannot discard a more limited knowledge on these food items. We may also hypothesise that this might be related to a poorer dissemination of the information about these food items in comparison with, for example, the emphasis given to the need to increase fruits and vegetables or to reduce sugars and salt. Understanding the general recommendations of the MD under the frame of each Mediterranean country's cooking and eating habits should be an objective of the GOODFOOD Learning Methodology, **reinforcing the knowledge and understanding of issues related with the MD** such as:

- i) clarifying the importance of the meat protein source (white meat vs red meat),
- ii) comparing the relevance of consuming whole bran cereals vs white products (pasta, rice, etc),
- iii) introducing 'red tomato sauce' as a healthy Mediterranean food item, and
- iv) exploring whether red wine is a healthy Mediterranean drink or not.

The **gaps of knowledge for students and teachers were mainly identified on the broader themes of sustainable food production and aspects of a sustainable diet**, while the participants demonstrated better knowledge on the broad theme of **healthy diet**. However, the importance of aspects like consuming **home-made food, meat consumption, and traditional cooking** for a healthy diet should be highlighted. Moreover, the issue of the **vegetarian diets** also seems to constitute an intriguing issue and it would be of interest to find out more about the lack of knowledge/understanding and/or opinion of the students about these types of diets.

On the theme of **sustainable food production**, the identified gaps of knowledge relate mainly to the importance of aspects like the low production cost and the development of new sources of food, as well as to specific issues like "sustainable farming" and "intensive farming", and terminology like "carbon footprint", "virtual water" and "genetically modified food".

On the theme of **sustainable diet**, gaps of knowledge were identified mainly with regard to the importance of the hedonic as well as the economic aspect of a sustainable diet (i.e. eating pleasurable

food as part of an affordable diet), and specific issues like “community-supported agriculture” and “food chains”, as well as terminology that connects to the theme of sustainable diet like the term “ecological footprint”.

Relating school subjects to the GOODFOOD themes

Among the wide range of school subjects proposed through the survey questionnaire, the participating students and teachers seem to attribute the stronger connections to the general GOODFOOD themes (i.e. food production, food consumption and healthy diet) to the subjects of Biology, Chemistry, History and Physical Education. The participants also attribute a strong connection to the subjects of Geography, Economics, Physics and Maths. A weaker connection to the GOODFOOD themes was attributed to the subjects of IT, Art and Literature. With regard to the proposed broad GOODFOOD themes, the participants relate the school subjects as follows:

Across the three themes: Biology, Chemistry, History, English (foreign language), Art

Mainly to the food production and consumption themes: Physics, Economics, Geography, Information Technology, Maths

Mainly to the healthy diet theme: Physical Education, Literature

Based on the findings above, school subjects are not given equal weight concerning their role in approaching the GOODFOOD themes. Although **the aim of the proposed GOODFOOD methodology is not to attribute equal weight** to all the STEAM subjects, it should describe **the role of the school subjects within the methodology**, especially the subjects with no strong connection to the themes, so that it is clear to the teachers implementing it.

Teachers' knowledge and experience regarding the IBL and STEAM educational approaches

The knowledge and experience of the teachers participating in the survey regarding key educational approaches proposed by the GOODFOOD project, i.e. the Inquiry-Based Learning approach, the project-based learning approach, the interdisciplinary collaboration among teachers and the STEAM approach, varies from country to country and strongly depends on whether the above approaches have been already implemented in the survey schools and to what extent. For example, the Greek school (1st Lyceum of Rafina) has already participated in Erasmus+ projects based on the IBL and project-based learning, therefore the Greek teachers who participated in the survey appear to be more experienced than their Italian and Spanish colleagues. However, it should be noted that this experience is in no case representative of Greek schools in general. Therefore, **there should not be an assumption that the teachers are familiar and experienced with any of the educational approaches proposed**. On the opposite, the survey participants indicated that the knowledge gaps of teachers on the STEAM approach poses the most important limitation for implementing it at school, together with practical issues regarding the integration of STEAM in the school programme, like the lack of time or equipment. The GOODFOOD learning methodology should provide the basic theoretical background for all the approaches above, especially STEAM, and should clearly describe the way in which they are integrated in one learning methodology that is flexible and can be implemented in different formal education contexts.

Current skills related to the GOODFOOD educational approach

The survey findings regarding the current level of necessary skills of students and teachers in relation to the proposed GOODFOOD approach, reveal variations from country to country and **a lack in skills** that may also connect to differences in the approaches of the secondary educational systems from country to country.

Regarding the **students' survey**, the proposed skills related to teamwork, fieldwork, using cameras and video-making software, employing art to communicate ideas and concepts, using online/mobile applications to assess the nutritional value or environmental impact of food, and assessing/verifying information found on the internet through more reliable resources. The survey results present great variations from country to country: the Spanish students are less experienced in working in teams, the Italian and Greek students are less experienced in doing fieldwork, the Spanish students have less experience in using cameras and video-making software, the Greek and Spanish students are not usually employing art to communicate ideas and concepts and have less experience in using online/mobile applications to assess the nutritional value or environmental impact of food, and the Spanish and Italian students are less experienced in assessing internet information.

Regarding the **teachers' survey**, the proposed skills related to using mobile devices for education at school, using digital applications to monitor the nutritional value or sustainability of food, using office software, working in collaboration with teachers from different disciplines, and guiding their students to work in teams, communicate their ideas verbally, carrying out fieldwork and keeping to deadlines. The results in the three countries converge to a great extent: the majority of the teachers are experienced in using mobile devices for educational purposes, appear to be less experienced in using digital applications to assess the nutritional value or sustainability of food, use office software regularly, and often guide their students to work in teams, do fieldwork, communicate ideas verbally, and keeping to deadlines. The results seem to differentiate between countries with regard to collaboration with colleagues from other disciplines: most Spanish and Greek teachers stated they do not collaborate regularly with colleagues from other disciplines, while 1 in 2 Italian teachers stated they do.

From the findings above it is clear that the lack of different skills from country to country, with regard to both students and teachers, dictates that the GOODFOOD learning methodology and learning modules **should provide clear instructions to the teachers** for encouraging teamwork in the class, implementing fieldwork, using mobile devices and applications in the framework of the GOODFOOD methodology, and effectively collaborating with colleagues and monitoring the learning process.

Interest regarding the GOODFOOD themes and approaches

Overall, the survey findings in the three countries reveal a **moderate to strong interest** of the majority of students and teachers in learning about the GOODFOOD themes. The students show a stronger interest in learning about topics that they consider to have a more direct impact on their own lives, like “ways to lead a sustainable and healthy diet” and “association of dietary habits with health”; the GOODFOOD learning methodology and tools should highlight the importance of topics related to the sustainable production and consumption of food, and especially how the three main themes of GOODFOOD, i.e. sustainable food production, sustainable food consumption and healthy diet, are strongly interlinked.

The survey findings in the three countries also indicate a strong interest of students and teachers in carrying out the **activities foreseen in the proposed GOODFOOD approach**, i.e. going out of the classroom and carrying out fieldwork, performing investigations, using mobile applications to monitor the sustainability or nutritional value of food, as well as working in teams and collaborating with peers. The reported reluctance of an important percentage of students in all three countries to involve their families and friends in a school project, or communicate their findings and experience to a wider audience, may connect to their lack of experience in carrying out these activities at school. However, the GOODFOOD learning methodology must take this into account and foresee the necessary guidelines to assist the teachers and students in carrying out these activities.

Perceptions and attitudes regarding the GOODFOOD themes and approaches

Overall, the survey findings demonstrate very positive attitudes from the vast majority of students and teachers in the three partner countries regarding the **GOODFOOD themes and aspects of the GOODFOOD learning approaches**. Students and teachers demonstrate high awareness on environmental issues and positive attitudes regarding the importance of being sustainable consumers and leading a healthy diet. The participants also demonstrated positive attitudes regarding aspects of the GOODFOOD approach like teamwork and the integration of digital applications in the learning activities at school, although 1 in 3 teachers from Spain and Italy stated they do not enjoy using their smartphones or tablets.

Moreover, the participants' engagement in the GOODFOOD themes through activities in their personal life is satisfactory. In general, the students and teachers who participated in the survey cook often and select the food to buy themselves, checking the nutritional value and additives/preservatives of food in the packaging, however they do not usually check the origin of food, search for the impacts of certain foods to health, or use an online application to monitor a food's sustainability or nutritional value.

Students' perceptions and attitudes towards the GOODFOOD STEAM components – Science, Technology, Engineering, Art, Humanities, Maths

Students from the three countries seem to feel more comfortable with Technology, moderately comfortable with the Humanities' field and not so comfortable with Engineering. While the Italian and Greek students feel more comfortable with Science (Biology, Physics, Chemistry) than the Spanish students, the Spanish students feel more comfortable with Art (i.e. drawing, design, photography etc.). Italian students in general feel more comfortable with Maths than the Spanish and Greek students.

The gender analysis indicates that **male students in general feel more comfortable with Maths and Engineering**, while the **female students feel more comfortable with the Humanities and Art**.

The above findings may connect to the particular context of the secondary education systems and curricula in the three countries, and the specific context of the schools that participated in the survey. However, the findings regarding the meaning and role of each field in the GOODFOOD STEAM approach and the attitudes of the different genders towards the various fields should be taken into account in the design of the GOODFOOD learning methodology and learning modules.