



sCOOL-IT Comprehensive training programme

Project:

Innovative ICT-based training approach to reshape school education and training

Intellectual Output 2



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1. Introduction to WebQuest Teaching methodology

1.1 Analysis of the sCOOL-IT WebQuest strategy

Definition of 'WebQuest'

A WebQuest, following Bernie Dodge's (creator of the WebQuest or WQ) concept definition, is an "an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the Internet" (B. Dodge, WebQuest page San Diego University). According to this approach, WebQuests are designed to use the learners' abilities properly and effectively, in order to create a focus on how to use information rather than merely on looking for it. WebQuests support the learners' thinking at the levels of analysis, synthesis, and evaluation.



Tell me and I forget. Teach me and I remember.

Involve me and I learn.

Benjamin Franklin



WebQuest is quite different from other Web-based experiences and the key idea that distinguishes it, is that **the WebQuest is built around a real and effective way to engage the students in tasks**, addressed to develop a personal and real thinking in the topic involved. It is not just research of data; it is more an activity related to doing something with proper and selected information. The way of thinking should be creative or critical and must involve problem solving, self-judgment, analysis of information and ability to synthesis. The different tasks must be more than mere answers to questions or a repetition of what is present on the Internet. It is a list of tasks that are addressed to reproduce (as possible) a scaled down version of what adults do on the job.

Since it was first developed in 1995 by Bernie Dodge the WebQuest strategy has been implemented by several education courses around the world. WebQuests are attractive because they provide guidance and suggestions for students and teachers about an educative use of the Web.

This Training manual aims to provide secondary school teachers with innovative, ICT-related, challenge-based training materials that will enrich their pedagogic approach.

In this manual the teachers will find a complete guide on how to use the WebQuest framework in their classes, with a list of suggested WebQuests, covering different topics and areas of secondary schools in Europe. The topics will be presented with practical indications about how to use them and in which classes, regarding the Countries involved in the project.

Structure of the WebQuests

Every WebQuest has five sections:



Introduction

This is the initial part of a WebQuest when the teacher presents the topic. It provides questions and issues, related to the lesson and to the learner's interests and at the same time engaging and challenging.

The Introduction helps to give a valid and stimulating idea of what the students are going to learn by going through the WebQuest experience. There are no specific rules for the introduction; however, the teacher must be clear about:

- ✦ The WebQuest opportunities, i.e., goals and rules
- ✦ The relationship between the WebQuest topic and the rest of the Curriculum (in the related subject)
- ✦ The educative and learning approach that should be adopted (critical and curious)

The teacher should ensure that the knowledge will be appreciated as valuable and meaningful. It should build on learner's prior knowledge and prepare the learner for the lesson.

The Introduction is always the first element of a WebQuest that the learners will see. It has to catch their interest from the beginning. For this purpose, a teacher can use facts or figures that the learners may not be aware of ("Did you know that?"); ask them rhetorical questions or challenge them ("If you want to know more about, then you really should take this quest!").

Task¹

The second phase of a WebQuest is the Task. It describes the activity's end product.

During this phase the teacher offers a clear description of the content of the activities the students will engage in during the proposed WebQuest. It is important that the Task includes problems, that challenge learners and encourage their creativity and originality. It is also crucial that they are encouraged to use problem-solving skills.

The tools for creating a task can be different and depend on the skills of the teachers. In general, tasks can include PowerPoint presentations, written, oral reports, persuasive essays, news articles, web sites, etc.

¹ Further reading for teachers: <http://webquest.org/sdsu/taskonomy.html>

The TASK is considered as the most important element by Dodge, so you need to make sure it sounds catchy and engaging but doable at the same time. If the task seems too unfeasible or daunting, it may discourage learners to go through with the WebQuest. It should require synthesis of multiple sources of information, and/or taking a position, and/or going beyond the data given and making a generalization or creative product. This section could include links to appropriate and pre-suggested resources and suggestions addressed to organize the information.

Process and resources

The Process consists of strategies and methods, that can be used by learners to complete the task and constitutes a step-by-step description of how students will accomplish the task. In this section, different roles can be distributed among students. This would create different perspectives and/or shared responsibility in accomplishing the task. Teachers can provide guidance on how students should organize the information they gathered.

In this section the teachers should also tell the students how they are supposed to work: in cooperative groups or independently.

Depending on the skills and knowledge that the WebQuest aims to convey, the process could involve various activities like research on the web, teamwork, role playing, preparation of presentations with the use of various digital tools, presenting in front of an audience. In addition, if you would like to enhance their soft skills like teamwork, presentation skills or other - apart from boosting the knowledge of learners on certain topics -, you can include role playing or preparation of presentations and then presenting in front of an audience. Based on what learning gaps you aim to address - you can be flexible in designing the Process.

The Resources include online sources, that students can use for collecting and selecting information to construct a complete final product, as requested in the WebQuest. These resources should be selected in advance by the teacher. Students should also be allowed to find and select autonomously the information they are able to gather with the needed critical thinking attitude.

Normally, the most common WebQuest strategies suggest to include the Resources in the Process, but the teachers may include them in an alternative section in the WebQuest.

When you have finished the Process, it's good to check your initial list of Resources – there may be some resources that aren't relevant anymore or you might need to add new ones based on the steps in the Process.

Evaluation

The last step is Evaluation. It is important that the students understand how they will be evaluated: in terms of self-evaluation this means that they should get familiar with the self-evaluation methods; they should know that the WebQuest is not an extra-curricular activity, but a methodology to help them to learn better and creatively.

Conclusion

This section summarizes the WebQuest process in the form of an adage or catchy explanation; it encourages learners to reflect on the process and the results from the activity.



In every WebQuest created by the sCOOL-it project, the teacher will find all indications and suggestions that are useful for providing an appropriate evaluation. However, space is left for the evaluation methodologies and strategies of the teachers that will experiment the sCOOL-IT WQs.

The Training programme target groups

The training program addresses two main categories of beneficiaries:

1. Secondary school teachers & headmasters

School teachers should be informed and trained how to use the WebQuests in their daily activities. They will use the sCOOL-IT project approach to learn about this innovative, challenge-based methodology. This will help to enrich their pedagogic approach: promoting better students' performance in general school subjects and also the development of transversal competencies and digital skills in line with the 21st century challenges.

The headmasters may use this training program to promote the WebQuest methodology as a common tool in their schools, to adopt it beyond occasional use and make sure that this approach reaches all teachers.

2. Secondary school students:

The sCOOL-IT project training program also addresses students in order to increase their level of engagement and interest towards general school subjects, using a new and creative tool. The sCOOL-IT project training program aims to help teachers and educators to effectively unlock this potential and engage contemporary students in an active learning process that creates a deeper understanding of school subjects such as sciences and math. Next to this it promotes the development of transversal competencies and digital skills.

1.2 WebQuest teaching methodology

A WebQuest is an innovative inquiry-oriented teaching strategy, that is typically designed as a webpage. Some or all information that learners interact with comes from internet-based resources. It concentrates on the research, compilation, and reprocessing of information, with the intention to involve the students in a cognitive process. WebQuests constitute several guided and structured activities, in which the tasks to accomplish are well defined. The WebQuest model is based on collaborative learning and constructivism: it challenges students with problems, that require creative and critical thinking.

WebQuests force students to explore issues and find their own answers – they have to do more than just memorize information. They must process the information in meaningful ways and reach moral and ethical decisions, guided by facts.



I hear and I forget. I see and I remember.

I do and I understand

Confucius



Methodology

The WebQuest model is based on the constructivist learning theory, according to which learners are the active part in the learning process, meaning that they are not just a passive receiver of information that is provided by the educator, but they are the ones constructing knowledge through their experiences with the world around them. Based on that they build their own representations and incorporate new information into their existing knowledge. The main principles of the constructivist learning theory are:

- ✦ Learners are constructing new knowledge by combining their previous knowledge to the new or modified knowledge they will build from new learning experiences.
- ✦ Personal learning is based on one's own understanding and interpretation of the world. As a result, the same teaching activity or information might result in a different form of understanding and new knowledge for each learner based on their previous knowledge and experiences.
- ✦ Learning is active rather than passive, meaning that knowledge is built through active engagement of the learners with the world e.g., real problem solving, experiments, experiences, etc. not just processing the information as provided.

WebQuests can be associated with the theories of Scaffolding and Inquiry-based learning. *Scaffolding* is a method that enables students to learn more by working with a teacher or a more advanced student to achieve their learning goals. The main idea behind this method is that students learn more efficiently when collaborating with others who have a wider or a different range of knowledge and skills than the student on his/her own. Peer collaboration allows the student to see different perspectives and be able to widen their learning scope and learn more than they would have been able to learn individually. WebQuests are usually



carried out in groups, they involve teamwork and a peer learning process. This constitutes an effective scaffolding process.

Inquiry-based learning requires a learner-centred teaching approach, in which the student plays a pivotal role by asking questions and exploring the material. The teacher has a guiding role: instead of providing materials or defining the right answers the teacher encourages learners to have group discussions, do research, think critically, and form their own answers and opinions about the issues explored. Teachers guide learners through a process of scientific inquiry, where they must follow specific steps to reach valid conclusions.

Role of the teacher

The fact that it is a learner-oriented activity means that the learner has an active, prominent role in the learning process. This doesn't mean that the trainers' role is of minor importance, exactly the opposite: the teacher is the one who builds bridges between incidental and intended learning and makes teaching and learning efficient. He/she is responsible for enriching the course with challenging, intriguing and motivating WebQuests. When designing the WebQuest, the teacher must select engaging and practical materials to help fulfil the task. In addition, teachers are responsible for providing students with the resources needed to create the final product. The teacher also organizes the cooperative environment and will delegate the different goals to be accomplished by each student. He/she plays an important role in assigning various roles to team members and in directing them in how to carry out their tasks. It is pivotal that the teacher clearly explains to the students what is expected, and exactly how they will be evaluated.

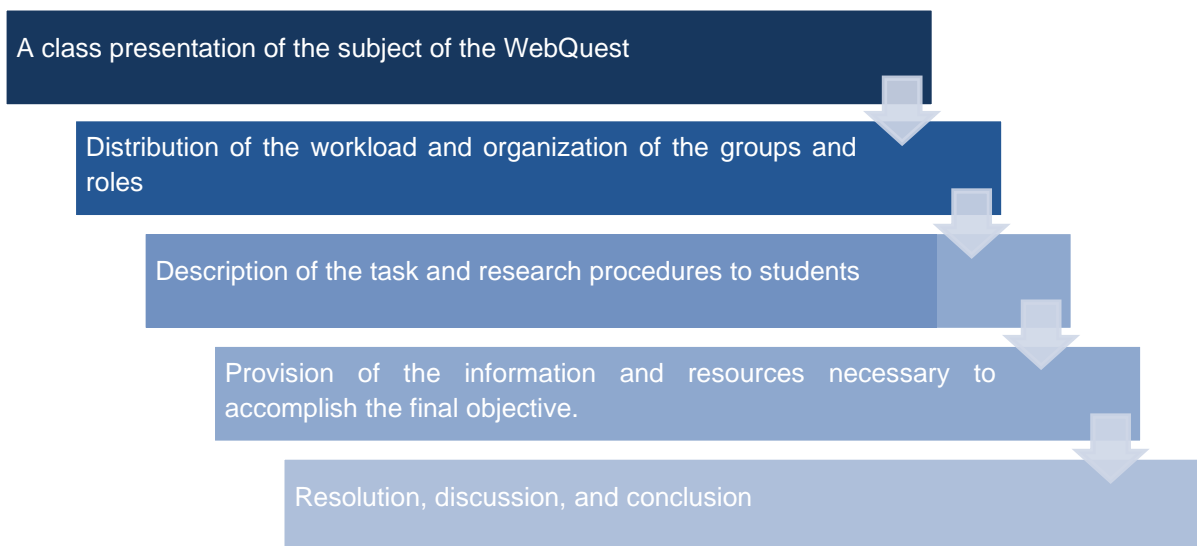
When using WebQuest teaching strategies, educators aren't supposed to tell learners what they "need" to do - everything they need to know is already stated in the WebQuest process, students just need to find it. The role of the teacher is to provide guidance and facilitate the process of their quest for knowledge.

Teachers shouldn't express direct opinions, criticize or discuss in terms of wrong or right. Learners should feel free to express their understanding and perceptions obtained in the WebQuest implementation without concern if it will be qualified as "right" or "wrong".

Role of the student

WebQuests are based on cooperation and collaboration, which enhances the students' sense of responsibility towards both group and individual learning. Each member of the group is individually responsible for his part in achieving the goal and sharing the knowledge that he has acquired. A WebQuest is effective when it forces students to depend on one another. WebQuest enable students to use internet resources efficiently and creatively: those preselected by the teacher and the ones they find themselves. This didactic strategy requires students to search for information, to reflect later and make decisions based on that information. An effective WebQuest enables students to use teamwork skills and prioritizes the transformation of information.

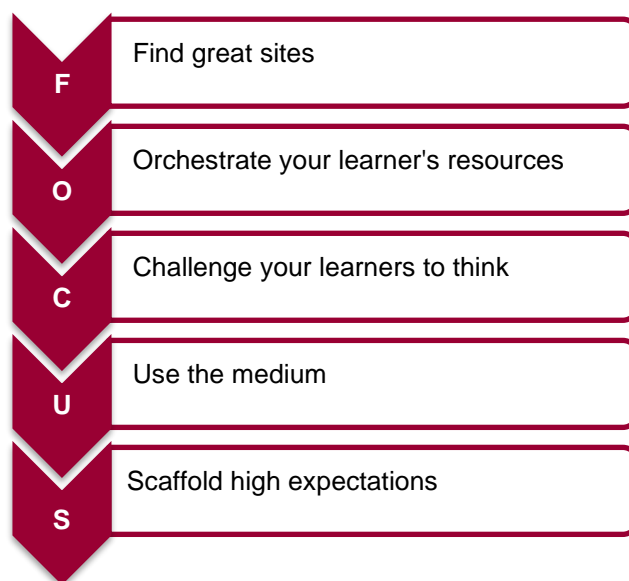
WebQuests also favour the “learning to learn” competence. Originally, the template designed by Dodge established the following fundamental steps to designing an effective WebQuest:



Fundamental characteristics

When designing a WebQuest, there are five fundamental characteristics:

- ✦ Find great sites: find sites which are suitable for the learner’s age and specific ways of learning. The websites should be readable and interesting to your students, up-to-date and accurate, and come from sources your students would not normally encounter in school.
- ✦ Orchestrate your learner’s resources: create separate responsibilities by having learners read different Web pages or by having them read the same Web pages from different perspectives.
- ✦ Challenge your learners to think: provide a challenging ground, on which students would build knowledge that would otherwise seem static and inert.
- ✦ Use the medium: the pedagogical structure of the WebQuest is not limited to use of the web.
- ✦ Scaffold high expectations: an effective WebQuest requires students to carry out tasks, which they normally would not do.



Advantages of WebQuests for teachers.

- ✦ Accommodates learners' diverse learning needs
- ✦ Guarantees that all students are on the sites they should be on.
- ✦ The structure is similar and easy to comprehend
- ✦ Creates the teachers' technical and information literacy skills synchronically
- ✦ Webpages and WebQuests enhances teachers' computer literacy

Advantages of WebQuests for students

The WebQuest constitutes a highly effective strategy, which is beneficial to students because it:

- ✦ Promotes student motivation and authenticity
- ✦ Develops thinking skills, by transforming information
- ✦ Encourages cooperative learning and teamwork
- ✦ Invokes an entertaining activity, which is enjoyable for students
- ✦ Enhances computer and technological competencies
- ✦ Stimulates imagination, creativity and initiative
- ✦ Helps students apply, synthesize, analyse, and evaluate what they are learning
- ✦ Encourages curiosity, because a WebQuest can include interdisciplinary topics, allowing for a crossover to other departments and subject areas.

WebQuest tasks

Dodge has identified several tasks, which can be used for a WebQuest.

1. **Retelling task:** In this type of task students are required to absorb information and then demonstrate what they have understood, by producing a document, presentation or summary. The teacher should consider the degree of information transformation required of the students.
2. **Compilation task:** students have to gather information from specific sources and compile it into a unique format. When designing this type of activity, it is important to remember that students should be encouraged to utilize skills such as the organization, selection and exposition of information.
3. **Mystery task:** in this task students are put in the middle of a mystery, which requires synthesis from a variety of sources in order to present a puzzle that cannot be solved simply by finding the answer on a specific webpage.
4. **Journalistic task:** The teacher asks the students to carry out journalistic description of an event with some sort of educational interest. The students must gather the facts and organize them according to type (interview, news story, report, etc). According to Dodge, the journalistic task is useful for identifying bias in the media. Each person has his own filters that affect the way he sees things and determine what draws his attention.
5. **Design task:** students need to develop a plan of action and meet a certain objective, while implementing specific regulations, such as budget, legal norms, design criteria, etc.
6. **Creative product task:** in this task students should create an art project in a given format such as a painting, theatrical play, poster, song, game, etc. The evaluation should be based on creativity and how well the students have observed the artistic style restrictions proposed by the teacher.
7. **Consensus building task:** it is a task, which requires the coordination, consideration and, if possible, the accommodation of different points of view around a disputed fact. It encourages the students to consider different perspectives by studying a wide variety of sources. The Consensus Building Task leads to a report that reflects the consensus that has been achieved. This document should be targeted at a specific audience.

8. Persuasion task: Students have to defend a point of view before an audience, which should be hostile to the topic to be defended. In this task students develop strategies and documents on ideas and methods of communicating opinions.
9. Self-knowledge task: this task requires students to resolve questions about themselves. These tasks are not exactly short. They can be based on long-term goals, ethics and moral considerations, self-betterment, art appreciation, personal tastes in literature, etc.
10. Analytical task: students have to pay attention to several issues, identify similarities and differences and understand the implications of both. This task makes the student understand cause and effect relationships. The teacher can ask the students to make thorough comparisons between phenomena, models, theories, authors, etc.
11. Judgment task: students are asked to exercise critical judgment and to establish some sort of rating. It should present information to be evaluated and make students take informed decisions.
12. Scientific task: this task requires comparison of data obtained from a variety of websites and students need to decide, which to support by describing their results and implications in a scientific reform.

Development of a WebQuest

Developing an effective WebQuest requires several tasks:

1. Define the topic: Teachers could identify gaps in the learning material or parts that could be taught in a more interactive manner. Otherwise, educators could decide on some “hot topics” from everyday life e.g. problems of your local community, global issues, some upcoming events or important events you have heard on the news. All of these sources could serve as a basis for an interesting WebQuest, if the right tasks and resources are provided.
2. Set learning objectives and outcomes: according to the identified learning gaps, define what you would like students to acquire in terms of knowledge, skills and attitudes upon completion of your WebQuest. Summarize the learning outcomes in a table so you have them in mind when designing the task and the process of the WebQuest.
3. Resource inventory: to search the Web for relevant resources that will guarantee the achievement of the objectives. Educators should take into consideration only authentic and reliable websites/platforms. The web resources should allow students to reflect, not only to provide static facts. It's recommended to choose media-rich websites which will ensure a higher level of engagement of the learners.
4. Design the WebQuest: by following the aforementioned structure, educators can create a word document, a platform or an excel sheet to present the WebQuest to learners, using catchy and understandable phrasings for the targeted learners.
5. Test the WebQuest: test the WebQuest with a small group of learners in order to validate whether the process you've designed serves the learning objectives, whether the learners are able to orient themselves in the WebQuest (e.g. whether it's written in appropriate language, whether it catches their interest, whether it leads them to a higher order thinking, whether the resources are appropriate for their age, etc.).

2. The WebQuests realized in the sCOOL-IT project: Learning outcomes and competences

2.1. Specific competences and learning outcomes

In general terms, all the produced WebQuest are related to a specific topic or theme being studied, providing to students' specific competences linked to each of the chosen topics. But it is worth mentioning that all the WebQuests emphasise higher-order thinking (such as analysis, creativity, or criticism) rather than just acquiring information.

For this reason, in this chapter, we demonstrate the specific skills related to the topic but also the transversal learning outcomes that result from using the sCOOL-IT WebQuests in the classrooms

All the WebQuest are available in the following website: www.scool-it.eu

Maths and Logics

Each WebQuest aims to convey knowledge of a specific topic linked to the math curriculum in the different countries. Therefore, to be able to effectively guide learners through each of them, it is highly recommendable that teachers make references to the table in the chapter 3.2 of this Manual where the matrix shows the level of applicability of each WebQuest to the different national curricula.

The teachers should check all the resources provided, but also do her/his own research on the subject. Apart from this he/she should simulate the tasks requested by the student and adapt both the process and resources to fit the capacities of the specific class.

Each of the WebQuests has specific learning outcomes linked to the covered topic, but all the WebQuests have other learning outcomes linked to transversal skills and competences.

Specific competences (linked to the topic of each “Maths and Logic” WebQuest)

WebQuest	Specific competences
<p>First-degree equations</p>	<ul style="list-style-type: none"> ✓ Resolve problems through the first-degree equations ✓ Understand and solve problems in their daily live based on first-degree equations ✓ Demonstrate knowledge of systems of linear equations ✓ Managing and solving functions from a numerical, graphical, verbal and analytic perspective
<p>Math helps the Good neighbourhood</p>	<ul style="list-style-type: none"> ✓ Resolve problems through square equations ✓ Demonstrate knowledge of absolute value, radical and power functions ✓ Perform algebraic operations on square equations ✓ Understand how math and 2nd degree equations can be applied to everyday tasks and routines
<p>Quadratic functions</p>	<ul style="list-style-type: none"> ✓ Use the discriminant to identify the types of solutions for quadratic functions ✓ Find the maximum or minimum value of a quadratic function ✓ Solve equations that are quadratic in form ✓ Understand how math and quadratic functions can be applied to everyday tasks and routines
<p>Rational inequalities - The inequalities of the second degree</p>	<ul style="list-style-type: none"> ✓ Solve problems with rational inequalities. ✓ Solve systems of linear equations in two variables ✓ Solve systems of linear and nonlinear inequalities ✓ Understand, apply and solve algorithms ✓ Understand how math and inequalities of the second degree can be applied to everyday tasks and routines
<p>Trigonometric functions of an acute angle</p>	<ul style="list-style-type: none"> ✓ Model using trigonometric functions ✓ Solve trigonometric equations ✓ Understand how to use the trigonometric identities and functions in real life
<p>The Pythagorean Theorem and its use in real life</p>	<ul style="list-style-type: none"> ✓ Label triangles for trigonometry through Pythagoras' Theorem ✓ Solve problems through the application of the Pythagoras' Theorem ✓ Understand the practical use of the theorem in real life situations and the Theorem's application to everyday tasks and routines.

Learning outcomes provided by each one of the “Maths and Logic” WebQuest

LEARNING OUTCOMES	KNOWLEDGE	SKILLS/ATTITUDE
Working in a team	<p>He/she knows team-working: roles, functions</p> <p>He/she knows structure and dynamics of the organization of the work in a team</p> <p>He/she identifies the role and position of each person within the group and how they interact</p>	<p>He/she can work in a team</p> <p>He/she recognizes and respects different roles</p> <p>He/she recognizes the organizational context of the work</p> <p>He/she understands the difference between working alone and working together</p> <p>He/she contributes in a positive way the group</p> <p>He/she adjusts to others' actions and behaviours</p>
Handling and understanding files, charts, and forms to record	<p>He/she knows the main instruments and communication tools and how to use them for specific goals</p>	<p>He/she fosters the readiness and openness to learn how to use files, charts, and forms to record</p>
Using common IT tools	<p>He/she knows the basics of information technology</p>	<p>He/she can carry out basic computer operations</p> <p>He/she can use specific tools at a basic level</p>
Respecting the point of views of other people	<p>He/she knows the main elements of relationships</p> <p>He/she considers different points of view</p>	<p>Have an open mind to different points of view</p>
Problem solving	<p>He/she knows how to identify and define a problem</p> <p>He/she knows how to search for information</p> <p>He/she knows how to analyse available information</p> <p>He/she knows how to break a problem into its key components</p> <p>He/she is able to formulate alternative solutions</p> <p>He/she knows how a solution can contribute to the desired effect</p>	<p>Readiness to engage in problematic situations where a solution is not obvious</p> <p>Willingness to deal with problematic situations, trying to solve them</p> <p>Developing of analytical skills to be able to evaluate information or situations, to break them down into their key components, to consider various ways of approaching and resolving them and to decide which is the most appropriate</p>

<p>Negotiation skills</p>	<p>He/she expresses his/her own position in a clear and appropriate manner</p> <p>He/she is able to ask questions</p> <p>He/she is able to listen actively</p> <p>He/she is able to convince the counterpart by providing arguments</p>	<p>Have an open mind to options suggested by classmates</p> <p>Communicate ideas in a proper way</p> <p>Perseverance in reaching an agreement</p> <p>Moderate level of ‘competitive spirit’</p>
<p>Collecting and processing information</p>	<p>He/she knows how to collect information from various sources, including new media</p> <p>He/she knows how to compare, categorize, and analyse information by identifying adequate strategies and approaches; research, organisation of information, the ability to interpret, compare, verify and critically process information</p>	<p>Critical approach towards information</p>
<p>Critical Thinking</p>	<p>He/she knows how to find and propose suitable solutions to an identified situation</p> <p>He/she’s able to manage priorities and changes, and to adapt his/her own plans, behaviours, strategies or approaches</p> <p>He/she knows how to critically analyse actions undertaken and used strategies regarding its contribution to a specific goal</p> <p>He/she is able to change his/her own actions if they don’t lead to the desired outcome</p>	<p>Thinking “outside the box”</p> <p>Critical approach</p>

Physics

Specific competences (linked to the topic of each **Physics** WebQuest)

WebQuest	Specific competences
What forces are you applying?	<ul style="list-style-type: none"> ✓ Apply the knowledge related to the different kinds of forces ✓ Understand the seven types of forces and when they are applied ✓ Use of the forces to solve everyday problems ✓ Apply the Newton's second law of motion to determine the weight of something
How does a LED Flashlight Work?	<ul style="list-style-type: none"> ✓ Discover how the flashlight works, identifying the elements of the electrical circuit, its function and the conditions to transfer of electrical energy in a circuit ✓ Use of series associated LEDs, which allows to investigate how energy receivers can be associated (series or parallel) ✓ Plan and assemble simple electrical circuits, schematizing them Relate electrical currents at various points and electrical voltages in simple circuits and evaluate the association of receivers in series and in parallel
History of the atom	<ul style="list-style-type: none"> ✓ Understand the history of the atom ✓ Understand the building blocks of everything that surrounds us and how the knowledge about them evolved over time ✓ Discover what is under the surface and comprehend of the laws of the Universe
Nuclear Energy And Nuclear Power	<ul style="list-style-type: none"> ✓ Understand about nuclear energy and nuclear power plants ✓ Discover the Nuclear Fission and its mechanism that supplies the energy and produces the radioactivity ✓ Analyse why some substances are radioactive and what does it mean ✓ Interpret information about nuclear waste
The Depths Of The Universe	<ul style="list-style-type: none"> ✓ Discover the mysterious and fascinating objects in the Universe ✓ Investigate Planets, Stars, Pulsars, Nebulas, Quasar ✓ Detect the Galaxy ✓ Comprehend what is the Black hole
Weight and measures	<ul style="list-style-type: none"> ✓ Understand and solve problems related to the measurement systems of units of measurement ✓ Evaluate the historical evolution of weights and measures ✓ Define and explain how the measure are different in some countries ✓ Explain the evolution of the systems of measurements

Learning outcomes provided by each one of the **Physics WebQuest**

LEARNING OUTCOMES	KNOWLEDGE	SKILLS/ATTITUDE
Working in team	The participant is able to function within a team.	The participant is competent in teamwork
	The participant can adequately interact within the team.	The participant is competent in communication skills.
	The participant recognises the hierarchy within the team.	The participant is competent in organizational skills.
Using common IT tools	The participant is able to use the correct approach to achieve the required results.	The participant is competent in digital mediums.
Respecting the others point of views	The participant is capable of discussing a point of view.	The participant is component in interpersonal and communication.
	The participant is able to accept another participants opinion.	The participant is competent in system based learning.
Problem solving	The participant is capable of foreseeing a problem and defining it.	The participant is competent in practice based learning
	The participant is capable of searching for specific information.	The participant is competent in procedures.
	The participant is capable analysing available information	The participant is competent in system based learning.
	The participant is capable of solving a lack of information by itself.	The participant is competent in research.
	The participant is adequate in supplying the required information.	The participant is competent in system based informatics
Negotiation skills	The participant is capable of sharing their meaning.	The participant is competent in communicating.
	The participant is adequate in development practices.	The participant is competent in system based communication.
	The participant is experienced in noting what is required.	The participant is competent in organisational aspects.
	The participant is capable of convincing the team of the requirements needed to succeed.	The participant is competent in practice based communication.
Collecting and processing information	The participant is able to collect information from various mediums.	The participant is competent in collective based learning
	The participant is able to process the required information	The participant is competent in system based storing of information.
Critical Thinking	The participant is flexible in their manner of working.	The participant is competent in presenting an alternative solution.
	The participant is able to adapt their	The participant is competent in

	<p>strategies or approaches.</p> <p>The participant is capable of adapting to what is required.</p> <p>The participant is, when required capable of changing their course of action to attain the required result.</p>	<p>teamwork.</p> <p>The participant is competent in adaptive skills.</p> <p>The participant is competent in attaining the objective.</p>
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Biology

Specific competences linked to the topic of each **Biological Science** WebQuests

WebQuest	Specific competences
- "Why do muscles do when running too fast?"	<ul style="list-style-type: none"> ✓ Structure and functioning of the circulatory system in humans; ✓ Structure and functioning of the respiratory system in humans. ✓ Cellular metabolism and energy production. ✓ Distinguish external breathing from internal breathing and describe morphological changes that occurred during pulmonary ventilation. ✓ Compare alveolar hematosis with tissue hematosis and recognize its importance in the body.
- "Ecosystem on Mars"	<ul style="list-style-type: none"> ✓ Linking biological diversity with interventions anthropic that may interfere with the dynamics of ecosystems (biotic/abiotic interactions). ✓ Systematize knowledge of biological hierarchy and ecosystem structure.
- "Genes and Eyes Colour"	<ul style="list-style-type: none"> ✓ Interpret information of structures cell carrying genetic material. ✓ Explain the relationship between hereditary factors, genetic information and how sexual reproduction conditions intraspecific diversity. ✓ Using Mendelian chess.
- "Exploring the Systems of the human body"	<ul style="list-style-type: none"> ✓ Characterize the human organism as an open system, identifying its levels of biological organization, anatomical directions and cavities. ✓ Relate the organs of the digestive system and their attached glands . ✓ Relate the constituents of the cardiovascular system. ✓ Identify the morphology and anatomy of the heart of a mammal, explaining its main constituents and their functions. ✓ Identify the main constituents of the respiratory system of mammal and its functions. ✓ Identify the constituents and functions of the central and peripheral nervous system. ✓ Characterize the skeletal system and identify major bones.
- "Covid 19, epidemics and pandemics"	<ul style="list-style-type: none"> ✓ Distinguish health from quality of life, according to the World Health Organization. ✓ Characterize the main diseases caused by the action of more frequent pathogens.

Learning outcomes provided by each one of the Biological Science WebQuest:

LEARNING OUTCOMES	KNOWLEDGE	SKILLS/ATTITUDE
<ul style="list-style-type: none"> ✓ Research and systematize information, integrating previous knowledge, to build new knowledge. ✓ Explore current or historical events that document the nature of scientific knowledge. ✓ Interpret experimental studies with control devices and controlled, dependent and independent variables. ✓ Perform activities in outdoor environments in the classroom articulated with other practical activities. ✓ Formulate and communicate critical opinions, scientifically based and related to Science, Technology, Society and Environment (CTSA). ✓ Articulate knowledge from different disciplines to deepen topics of Biology and Geology. 	<ul style="list-style-type: none"> ✓ Teamwork: roles and function. ✓ Use of the internet securely. ✓ Use various web tools in the construction and presentation of the works. ✓ Information and communication ✓ Reasoning and resolution of problems ✓ Critical thinking and creative thinking ✓ Relationship ✓ Interpersonal ✓ Personal development and autonomy ✓ Wellbeing, health and environment ✓ Aesthetics sensitivity and Artistic ✓ Scientific knowledge, ✓ Technical and technological ✓ Awareness and mastery of the body 	<ul style="list-style-type: none"> ✓ Rigour, articulation and consistent use of knowledge; ✓ Selection, organization and systematization of relevant information, with independent reading and study; ✓ Analysis of facts, theories, situations, identifying elements or data; ✓ Memorization, understanding, consolidation and mobilization of intra and interdisciplinary knowledge. ✓ Formulation of hypotheses and predictions in the face of a phenomenon or event; ✓ The design of situations in which a particular knowledge can be applied; ✓ Imagination of alternatives to a traditional way of addressing a problem situation; ✓ Sustained design of own points of view, in view of different perspectives; ✓ Creative expression of learning (e.g. images, text, graphic organizer, templates)

Geography

Specific competences (linked to the topic of each Geography WebQuest)

WebQuest	Specific competences
A mission for the international Geographic Union. (IGU)	<ul style="list-style-type: none"> ✓ Research competence ✓ Digital competence. ✓ Organizational competence. ✓ Presentation competence ✓ Practice based learning ✓ Systems based learning
And the winner is?	<ul style="list-style-type: none"> ✓ Presentation competence ✓ Research competence ✓ Digital competence ✓ Organizational competence ✓ Practice based learning

Time zones, DST and Flat Earthers.	<ul style="list-style-type: none"> ✓ Research competence ✓ Digital competence ✓ Organizational competences
Climate change and the mega glaciers.	<ul style="list-style-type: none"> ✓ Presentation competence ✓ Research competence ✓ Digital competence ✓ Organizational competence ✓ Practice based learning
Deforestation	<ul style="list-style-type: none"> ✓ Research competence ✓ Digital competence ✓ Organizational competence ✓ Practice based learning
How to plan a city from the future.	<ul style="list-style-type: none"> ✓ Presentation competence ✓ Research competence ✓ Digital competence ✓ Organizational competence ✓ Practice based learning

Learning outcomes provided by each one of the **Geography WebQuest**

LEARNING OUTCOMES	KNOWLEDGE	SKILLS/ATTITUDE
Working in team	The participant is able to function within a team.	The participant is competent in teamwork
	The participant can adequately interact within the team.	The participant is competent in communication skills.
	The participant recognises the hierarchy within the team.	The participant is competent in organizational skills.
Handling and understanding file, charts, and forms to record	The participant is able to gather all the necessary information.	The participant is competent in organisational aspects.
	The participant is able to chart the appropriate information.	The participant is component in system based working.
Using common IT tools	The participant is able to use the correct approach to achieve the required results.	The participant is competent in digital mediums.
Respecting the others point of views	The participant is capable of discussing a point of view.	The participant is component in interpersonal and communication.
	The participant is able to accept another participants opinion.	The participant is competent in system based learning.
Problem solving	The participant is capable of foreseeing a problem and defining it.	The participant is competent in practice based learning
	The participant is capable of	The participant is competent in

	<p>searching for specific information.</p> <p>The participant is capable analysing available information</p> <p>The participant is capable of solving a lack of information by itself.</p> <p>The participant is adequate in supplying the required information.</p>	<p>procedures.</p> <p>The participant is competent in system based learning.</p> <p>The participant is competent in research.</p> <p>The participant is competent in system based informatics</p>
Negotiation skills	<p>The participant is capable of sharing their meaning.</p> <p>The participant is adequate in development practices.</p> <p>The participant is experienced in noting what is required.</p> <p>The participant is capable of convincing the team of the requirements needed to succeed.</p>	<p>The participant is competent in communicating.</p> <p>The participant is competent in system based communication.</p> <p>The participant is competent in organisational aspects.</p> <p>The participant is competent in practice based communication.</p>
Collecting and processing information	<p>The participant is able to collect information from various mediums.</p> <p>The participant is able to process the required information</p>	<p>The participant is competent in collective based learning</p> <p>The participant is competent in system based storing of information.</p>
Critical Thinking	<p>The participant is flexible in their manner of working.</p> <p>The participant is able to adapt their strategies or approaches.</p> <p>The participant is capable of adapting to what is required.</p> <p>The participant is, when required capable of changing their course of action to attain the required result.</p>	<p>The participant is competent in presenting an alternative solution.</p> <p>The participant is competent in teamwork.</p> <p>The participant is competent in adaptive skills.</p> <p>The participant is competent in attaining the objective.</p>

Philosophy

Specific competences (linked to the topic of each **Philosophy WebQuest**)

WebQuest	Specific competences
Do You like street art?	<ul style="list-style-type: none"> ✓ Research competence ✓ Digital competence. ✓ Practice based learning ✓ Systems based learning
Cyberbullying, damage to the youngsters	<ul style="list-style-type: none"> ✓ Presentation competence ✓ Research competence ✓ Digital competence ✓ Practice based learning
The ethics of ethical hacking and hacktivism	<ul style="list-style-type: none"> ✓ Research competence ✓ Digital competence ✓ Practice based learning ✓ Systems based learning
The influence of Twitter on modern society	<ul style="list-style-type: none"> ✓ Research competence ✓ Digital competence ✓ Practice based learning
Present Implications Of Phillipa Foot’s “Trolley Problem”/ Self-Driving Cars – Yes Or No?	<ul style="list-style-type: none"> ✓ Research competence ✓ Presentation competence ✓ Digital competence ✓ Organizational competence ✓ Practice based learning ✓ System based learning
What should I do? Let's think critically and reflectively about right and wrong, good and bad.	<ul style="list-style-type: none"> ✓ Presentation competence ✓ Research competence ✓ Digital competence ✓ Organizational competence ✓ Practice based learning
EPIC narration: what an awful adventure!	<ul style="list-style-type: none"> ✓ Presentation competence ✓ Research competence ✓ Digital competence ✓ Organizational competence ✓ Practice based learning ✓ System based learning.

Learning outcomes provided by each one of the **Philosophy WebQuest**

LEARNING OUTCOMES	KNOWLEDGE	SKILLS/ATTITUDE
Working in team	The participant is able to function within a team.	The participant is competent in teamwork
	The participant can adequately interact within the team.	The participant is competent in communication skills.
	The participant recognises the hierarchy within the team.	The participant is competent in organizational skills.
Handling and understanding file, charts, and forms to record	The participant is able to gather all the necessary information.	The participant is competent in organisational aspects.
	The participant is able to chart the appropriate information.	The participant is component in system based working.
Using common IT tools	The participant is able to use the correct approach to achieve the required results.	The participant is competent in digital mediums.
Respecting the others point of views	The participant is capable of discussing a point of view.	The participant is component in interpersonal and communication.
	The participant is able to accept another participants opinion.	The participant is competent in system based learning.
Problem solving	The participant is capable of foreseeing a problem and defining it.	The participant is competent in practice based learning
	The participant is capable of searching for specific information.	The participant is competent in procedures.
	The participant is capable analysing available information	The participant is competent in system based learning.
	The participant is capable of solving a lack of information by itself.	The participant is competent in research.
Negotiation skills	The participant is adequate in supplying the required information	The participant is competent in system based informatics
	The participant is capable of sharing their meaning.	The participant is competent in communicating.
	The participant is adequate in development practices.	The participant is competent in system based communication.
	The participant is experienced in noting what is required.	The participant is competent in organisational aspects.
Collecting and processing information	The participant is capable of convincing the team of the requirements needed to succeed.	The participant is competent in practice based communication.
	The participant is able to collect information from various mediums.	The participant is competent in collective based learning

	The participant is able to process the required information	The participant is competent in system based storing of information.
Critical Thinking	The participant is flexible in their manner of working.	The participant is competent in presenting an alternative solution.
	The participant is able to adapt their strategies or approaches.	The participant is competent in teamwork.
	The participant is capable of adapting to what is required.	The participant is competent in adaptive skills.
	The participant is, when required capable of changing their course of action to attain the required result.	The participant is competent in attaining the objective.

History and Cultural heritage

Specific competences (linked to the topic of each **History and Cultural heritage** WebQuest)

WebQuest	Specific competences
WebQuest name: Seeing Rome with the ancient roman’s eyes: A day in a life of an ancient roman.	<ul style="list-style-type: none"> ✓ Understand that language, law and administration were unifying elements of the empire; ✓ To recognize the importance of citizenship values for the formation of civic awareness and responsible intervention in democratic society; ✓ Promote an approach to history based on ethical and aesthetic criteria.
WebQuest name: Industrial Revolution and technological unemployment. Are robots going to take our jobs one day?	<ul style="list-style-type: none"> ✓ Identify the main industrialized powers in the 19th century, emphasizing the importance of the transport revolution for the globalization of the economy; ✓ Select changes that have been made at the economic, social and demographic level due to the development of the means of production; ✓ Relate the living and working conditions of the operative with the appearance of the claimant movements and the socialist ideology
WebQuest name: What problems did democracies face in the 1930s XX.? Is today?	<ul style="list-style-type: none"> ✓ Interpret the expansion of new ideologies and the interventionism of democratic states in the light of the crises of liberal capitalism, particularly the crisis of 1929; ✓ To characterize the fascist, Nazi and Stalinist regimes, distinguishing their particularisms and highlighting the role played by propaganda in all of them
WebQuest name: National history – just a modern invention?	<ul style="list-style-type: none"> ✓ Frame the new social and political proposals in the philosophy of Lights; ✓ Identify/apply the concepts: Scientific revolution; Rationalism; Enlightenment; Separation of powers; Popular sovereignty; Human rights.
What is it like to live in the Stone Age?	<ul style="list-style-type: none"> ✓ Recognize in the manufacture of instruments and in the field of on Nature crucial moments for the development of Humanity

Learning outcomes provided by each one of the History and Cultural Heritage WebQuest:

LEARNING OUTCOMES	KNOWLEDGE	SKILLS/ATTITUDE
<ul style="list-style-type: none"> ✓ Research and systematize information, integrating previous knowledge, to build new knowledge. ✓ Explore current or historical events that document the nature of scientific knowledge. ✓ Interpret experimental studies with control devices and controlled, dependent and independent variables. ✓ Perform activities in outdoor environments in the classroom articulated with other practical activities. ✓ Formulate and communicate critical opinions, scientifically based and related to Science, Technology, Society and Environment (CTSA). ✓ Articulate knowledge from different disciplines to deepen topics of History and Cultural Heritage. 	<ul style="list-style-type: none"> ✓ Team work: roles and function. ✓ Use of the internet securely. ✓ Use various web tools in the construction and presentation of the works. ✓ Information and communication ✓ Reasoning and resolution ✓ of problems ✓ Critical thinking and ✓ creative thinking ✓ Relationship ✓ Interpersonal ✓ Personal development and autonomy ✓ Wellbeing, health and ✓ environment ✓ Aesthetics sensitivity and ✓ Artistic ✓ Scientific knowledge, ✓ Technical and technological ✓ Awareness and mastery of the body 	<ul style="list-style-type: none"> ✓ Rigour, articulation and consistent use of knowledge; ✓ Selection, organization and systematization of relevant information, with independent reading and study; ✓ Analysis of facts, theories, situations, identifying elements or data; ✓ Memorization, understanding, consolidation and mobilization of intra and interdisciplinary knowledge. ✓ Formulation of hypotheses and predictions in the face of a phenomenon or event; ✓ The design of situations in which a particular knowledge can be applied; ✓ Imagination of alternatives to a traditional way of addressing a problem situation; ✓ Sustained design of own points of view, in view of different perspectives; ✓ Creative expression of learning (e.g. images, text, graphic organizer, templates)

2.2 Recommendations for teachers

The following suggestions for implementing WebQuests can be useful for the teachers:

- ✦ Teachers have to choose the WebQuest wisely and perform an analysis to whether the WebQuest is developmentally appropriate for the intended age group
- ✦ Teachers should make sure that all learners read the introduction and the instructions on how to work with this WebQuest.
- ✦ All the WebQuest are based on the well know principle of self-guided learning. There are no external models or methods required other than to answer all the questions and perform the required research or other tasks.
- ✦ It is crucial for teachers to understand that WebQuests are not designed just because they are “fun.” While engaged in a WebQuest activity, students are not only learning factual information but, they are classifying, evaluating, synthesizing, forming and testing hypotheses, making decisions, forming opinions, and participating in many other higher level thinking activities
- ✦ Teachers have to clarify the student’s roles and give an explanation of the process learners should go through in carrying out the tasks
- ✦ The focus of the learner should be on the process of exploration (how to find what I am looking for) and the results/facts that they discover. A teacher should do no more than facilitate and support the process and not provide easy solutions.
- ✦ A teacher should not at any moment try to influence the argumentation and opinion development of the learners: they are in charge of their content-based opinion development.
- ✦ Teachers have to encourage the learners to fully engage in discussions, helping pupils to develop their own opinions and to exchange their views and knowledge. Most of the WebQuests help pupils to develop their opinions and beliefs, based on the facts they investigate.
- ✦ Some WebQuests are related to “hot topics” (religious beliefs, racism, cyberbullying...). In these cases the subjects can lead to heated discussions about issues that may not be directly related but are seen as relevant by some. The teacher should be aware that these subjects can be very sensitive for some students, so is the specific task of the teacher to keep the discussions ‘clean’ and focused on factual issues.
- ✦ Teachers should use the rating structure as provided at the end of each WebQuest, but it is even better if the process is followed by a thorough discussion by teacher and learners in order to explain the scores given to them. Other evaluation methods are possible as well, depending on what’s usual within the school. Certainly, the teacher should avoid helping the learners too much and provide answers: it is the learner’s search that counts. From this, the learning effects and outcomes derive.

3. sCOOL-IT training curriculum vs School training curriculum

3.1. Didactic and pedagogic approaches at the basis of the sCOOL-IT WebQuests

The WebQuest produced within the sCOOL-IT project are based on the information-constructivist approach (McGroarty, 1998; Matthews, 1998) that aims at creating, analysing and searching information, based on projective, active and constructive training methods. This approach is introduced as an integral meta-approach that serves as a guide for the implementation of other specific psychological and pedagogical approaches to intensify the students' training and ensure the necessary information-didactic space.

In the educational environment the didactic potential of the information-constructivist approach is presented in the application of projective and constructive methods of training, which develop students' skills of solving realistic educational and professional tasks. Students are mainly involved in group-work to find solutions to a certain problem. According to the information-constructivist approach, a teacher is no longer a person who gives lessons on a particular subject, but a consultant, organizer and coordinator of the problem-oriented, learning through research and other cognitive activity of students. She/he creates conditions for their independent mental activity, stimulating their proactive attitude.

Consequently, students become actors in the training process and share the responsibility for it and for its results with the teacher.

Based on the project method it integrates program, group, and communicative methods, as well as the problem method, the method of conversation and the Dalton-plan methodology (Dodge, 2001). Herewith, the WebQuest produced within the sCOOL-IT project involve various topics, and problematic tasks may differ in degree of complexity.

With the sCOOL-it WebQuests, groups of students follow a guided lesson, search for information using - internet sites and resources selected by the teacher or student, answer questions that encourage critical thinking, and present their ideas through a “final product” (multimedia presentation, web page....). WebQuests can be short-term or longer term, based on a single topic or being cross-curricular.

The most exciting aspect of WebQuests is that they support the education research connections to constructivism, multiple intelligences, critical questioning, and brain research and, best of all, they provide a useful integration tool that teachers can reuse, with minor adjustments, every year.

Tom March, a colleague of Bernie Dodge, writes: “Research has shown that the most important factor related to student learning and technology use is how teachers relate the technology-based activity to other learning activities.” To heighten student learning, it is important for the teacher to relate the WebQuest to other off-line learning activities, both before, and after, the WebQuest. The WebQuest should not be “an isolated experience disconnected from the rest of [the] curriculum.” (March 1998). For this reason, each of the produced WebQuest has been related to the different national curricula.

In this framework in all the WebQuest, the questions are designed to encourage students to ask each other questions, analyse information and synthesize multiple sources of information. “A WebQuest forces students to transform information into something else: a cluster that

maps out the main issue, a comparison, a hypothesis, a solution, etc.” (March 1998).

The critical questioning involved in the sCOOL-it WebQuests encourages the learner to articulate personal perspectives about issues and then compare and analyse these perspectives against those of others. This helps the learner to construct an understanding that builds on his/her individual prior knowledge. In this sense the WebQuests support many of the ideas of constructivism. The process in which the students merge their information promotes the use of co-operative learning strategies.

It's very important to analyse, for each of the developed thematic fields, what the level of correspondence is of the sCOOL-IT WebQuests with the national school curriculum in each country and for which specific age range of students.

3.2. How the sCOOL-IT WebQuests fit with the national curricula

The following matrix shows the level of applicability of the WebQuests to the different national contexts of the countries involved in the sCOOL-IT project:

Mathematics and logics

All the WebQuests linked to the **Mathematics and logics** are suitable for the school curriculum in the countries involved in sCOOL-IT project: pupils between the age of 12 and 16 would be expected to be able to complete them.

Moreover, all the WebQuests can be part of the teaching methods and materials of the teachers. Their applicability is further specified in the table below:

WebQuest title	Level of applicability in the national school curricula				
	BG	IT	NL	CY	PT
First-degree equations	8 th grade students (14 years old)	1 st year of the secondary school (both for the lyceums and for technical schools) (14 years old students)	Suitable for all four years of education at a practical school	8 th grade students (14 years old)	7 th and 8 th grade. 12-13 years old
	This WebQuest can be used also for older students, since it involves logical tasks with wider applicability. It's useful for all students for understanding how math and 1 st degree equations apply to everyday tasks and routines. The approach is mostly at individual level.				
Math helps the Good neighbourhood	8 th grade students (14 years old)	2 nd year students (15 years old) both for the lyceums and for the technical schools	Suitable for all four years at a practical school, from 13 years until 16 years	8 th and 9 th grade students or age group 14-15	8 th grade. 13 years old
	This WebQuest makes use of square equations, so a prerequisite is to know how to deal with 1 st degree equations. It is useful for all students for understanding how math and 2 nd degree equations apply to everyday tasks and routines. The real-life situation makes it an interesting topic to use in mathematics.				

	It would also be suitable as an additional learning material to the textbook lessons since it demonstrates the applicability of math in real life situations. The WebQuest involves group work.				
Quadratic functions	8 th graders (14 years old students).	2 nd year of the lyceums and first year in technical schools (14 – 15 years old students)	The topic is suitable for pupils of 14-15 years	9 th grade: students that belong at the age group 15	9 th and 10 th grades. 14-15 years old
	This WebQuest would be also suitable as an additional task to the textbook material or as an extracurricular activity. It is useful for all students for understanding how math can be applied to everyday tasks and routines. The approach is mostly at group level.				
The inequalities of the second degree	9 th graders (15 years old students)	3 ^d year of the scientific lyceums and technical schools (16 years old students)	It is suitable for pupils of 14 years until 16 years	This WebQuest is suitable for students in the age group 15 and older (9 th grade and higher)	10 th grade - 15 years old
	The topic of this WebQuest is very important because algorithms have a strategic role in the digital world. Therefore, this WebQuest would also be suitable as an additional learning material to the textbook lessons: it can be used as part of the students' teaching process or as additional learning/practice material. The approach mostly involves group-work.				
Trigonometric functions of an acute angle	9 th graders (students at 15 years).	4 th year of both lyceums and technical schools (students at 16+ years of age)	The topic is suitable for pupils of 14-15 years. The WebQuest has to be adjusted to the level of class.	This WebQuest is suitable for students at the age of 16 years and older (10 th grade and higher)	11 th grade - 16 years old.
	This WebQuest would also be suitable as an additional learning material to the textbook lessons. It can be used as an additional learning/practice material. The approach is mostly at individual level.				
The Pythagorean Theorem and its use in real life:	8 th grade students (14 years old)	1 st year of the secondary school (both for the lyceums and for the technical schools) (14 years old)	This WebQuest is, with extra explanation, suitable for most of the pupils at a practical school	This WebQuest is suitable for students at the age of 14 years (8 th grade)	8 th grade (Geometry and measures) - 13 years.
	This WebQuest could be used as an additional learning material to demonstrate the practical use of the theorem in real life situations. It can also be an additional learning/practice material to make students understand the Pythagorean Theorem's application to everyday tasks and routines. The real-life situation makes it an interesting topic to use in mathematics. The approach is mostly at group level.				

Biological sciences

sCOOL-IT

Innovative ICT-based training approach to reshape school education and training
project Ref. № 2019-1-BG01-KA201-062543



Almost all WebQuests linked to **Biology** are suitable for the school curriculum in the countries involved in the sCOOL-IT project and for the age of 14-16 years. Their applicability is further specified in the remarks given below:

WebQuest title	Level of applicability in the national school curricula				
	BG	IT	NL	CY	PT
The human body	8 th grade (14 years old) for comprehensive high schools	2 nd year for scientific and classic lyceums and the 1 st year of the technical schools (14-15 years old)	The topic fits within the school curriculum for first year pupils up to fourth year pupils	This WebQuest is suitable for students at the age of 15 and older (9 th grade and higher)	9 th grade – 14 years old
	This WebQuest could complement the learning material at school as it builds on existing knowledge. It can also be used as part of the students' learning process or as an additional learning/practice material. The approach involves mostly group-work.				
Ecosystem on Mars:	10 th grade students (16 years old) or above as it fits within the curriculum for this year	2 nd or 3 rd years of all the secondary schools (16+ years old)	This topic is not suitable for the pupils at a practical school. The terminology is too difficult, the level of English is too hard for the pupils to understand.	This WebQuest is suitable for students at the age of 16 and older (10 th grade and higher). It does not apply to the official national curriculum, so it may be used only as an extracurricular learning/practice material and show the differences with the Earth	10 th grade – 15 years old
	This WebQuest cannot be directly linked to the official school curricula in Cyprus and the practical education schools in The Netherlands. Anyway it would be suitable for extracurricular activities and learning/practice material to show the differences with the Earth, either in comprehensive schools or in more scientific schools. The approach involves mostly group-work.				
Fractals -	8 th – 10 th grade students	The topic is quite wide	The topic is not suitable for	This WebQuest is	10 th grade – 15 years

sCOOL-IT

Innovative ICT-based training approach to reshape school education and training
project Ref. № 2019-1-BG01-KA201-062543



Geometry within us	(14-16 years old)	and can be suitable for second and third years of secondary schools (14-15 years old)	the pupils at a practical school. The terminology is too difficult, the level of English is too hard for the pupils to understand	suitable for students at the age of 15 and older (9 th grade and higher)	old
	<p>This WebQuest cannot be directly linked to the official school curricula in Cyprus and the practical education schools in The Netherlands. Anyway it would be suitable for extracurricular activities and learning/practice material to show the students how biology and mathematics are connected</p> <p>The approach involves mostly group-work. It would also be suitable as an additional task to the textbook material.</p>				
Genes and Eyes' Colour	10th grade students (16 years old)	Second year of the technical schools and third year of the lyceums (15-16 years old)	this topic is covered in the curriculum for all four years at a practical school. The WebQuest would have to be adjusted to comply with the level of education per year	This WebQuest is suitable for students at the age of 16 and older (10 th grade and higher)	9 th grade – 14 years old
	<p>This WebQuest could be used to complement the learning material at school as it builds on already existing knowledge it would be suitable for extracurricular activities and learning/practice material deepen students' knowledge of heredity. The approach involves mostly group-work.</p>				
Why do muscles hurt when you run too fast?:	8 th graders (14 years old)	2 nd year for scientific and classic lyceums and the 3 rd year of the technical schools (15-16 years old)	The topic fits within the school curriculum. It would have to be adjusted to the twelve to sixteen year old	This WebQuest is suitable for students at the age of 15 and older (9 th grade and higher)	9 th grade – 14 years old
	<p>This WebQuest could be used as an additional learning/practice material to the lessons taught in class to deepen students' knowledge and understanding of the human muscles since it complements the textbook material dedicated to this topic. The approach involves mostly group-work.</p>				
COVID 19, Epidemics and Pandemics	10 th graders (16 years old)	The WebQuest is suitable for the second, third and fourth year of the Italian secondary schools (14 - 15-16 years old) because it can be linked to many	This topic is suitable for the second, third and fourth year of the school curriculum	This WebQuest is suitable for students at the age of 16 and older (10 th grade and higher)	9 th and 10 th grade – 14/15 years old

	curricular topics
	This WebQuest does not apply to all the official national curricula, so it may be used mainly as an extracurricular learning/practice activity. Therefore, it would be suitable for a large age group because it gives an extra look into the current global situation linked to the COVID pandemic. The real life situation makes it a very interesting topic. It uses two approaches – both individual and group work.

History and Cultural Heritage

Not all the developed WebQuests fall strictly into the topics covered by the national curricula in history of the countries involved in the sCOOL-IT project. However, they could still be used as extracurricular activities in comprehensive high schools or as additional learning materials in humanitarian high schools (focusing on exhaustive studies of humanitarian subjects). In some countries, the theme of the WebQuests require a higher level of education.

The specific applicability of each WebQuest is specified in the comments below:

WebQuest title	Level of applicability in the national school curricula				
	BG	IT	NL	CY	PT
What is it like to live in the Stone Age?	The Stone Age period is not a topic that is specifically covered in Bulgarian high schools. However, the curriculum envisages exploring the topic of Bulgarian’s lands in the prehistoric age as part of 10 th graders history lessons (16 years old)	1st year for lyceums and the technical school (14 years old), since the <i>Stone Age</i> is a period of prehistory	1st year pupils. The age group is between twelve and thirteen years old.	This WebQuest is suitable for students at the age of 14 (8 th grade), when they learn about the world and the timing periods from the beginning to today	7 th grade - 12 years old
	This WebQuest could be used as an extracurricular activity for teaching about the Stone Age as a period of prehistory, so it can be also seen as a kind of additional and fun learning/practice material. The approach is mostly at individual level.				
National history – just a modern invention?	This WebQuest explores the topic of “enlightenment” which is part of the national	1st year for lyceums and technical school (14 years old)	Third year (15 years old) at a practical school	This WebQuest is suitable for students at the age of 15 and older	11 th grade - 16 years old

	curriculum for 8 th graders (14 years old students).			(9 th grade and higher). It is linked with the official national curriculum: 'Europe in modern times (15 th -18 th centuries)'	
This WebQuest introduces a well-phrased topic, "enlightenment". The WebQuest could also be used as an additional activity to the history lessons taught in class (since it goes deeper into details than what is usually the case) or as an extracurricular activity. The approach involves mostly group-work.					
Industrial Revolution and Technological Unemployment. Are robots going to take our jobs one day?	The theme of "industrial revolution" is covered in the curriculum for 8 th graders (14 years old students)	Third year in the lyceums and fourth year of the technical schools (16+ years old students)	The theme of "industrial revolution" is covered in the curriculum for the practical school. This age group is between 13 and 15 years old	This WebQuest is suitable for students at the age of 16 and older (10 th grade and higher) It is linked with the official national curriculum: 'Economic, social and political developments in Europe and the world in the 19 th century'	8 th and 11 th grades. 13 and 15 years old
This WebQuest explores the topic of industrial revolution and its consequences for human life. It would also be suitable as an additional task to the textbook material or as an extracurricular activity. The approach involves mostly group-work.					
What problems did democracies face in the 1930s XX.? Is today?	9 th graders (15 years old)	Fourth year of the Italian secondary schools (16+ years old)	This WebQuest is suitable for students at the age of 15 and older	This WebQuest is suitable for students at the age of 15 and older (9 th grade and higher)	Applicable to students between 14 and 16 years old, in the Domains "Totalitarian options" and "Fascism: theory and practice"
The topic of this WebQuest involves a theme that is partially taught in the official curricula of the countries involved in the sCOOL-IT project: "democracies" is theme that is taught but it does not go as deep as in this WebQuest. For this reason, it may be used as extracurricular learning/practice material, linked with the official national curriculum: 'World War II'. The WebQuest is suitable as additional learning material, complementing the classroom lessons since it requires a deeper exploration of the events around the First World War and their consequences.					

Collaborative and cooperative group work (4 students) is intended, using primarily the internet for the search for knowledge.					
From Slavery to Black Lives Matter	8 th graders (14 years old). However, its applicability could be extended to high school students of other ages, since the WebQuest makes a connection between historical events and some hot contemporary topics. In this sense, it encourages critical thinking and could be of interest to people well beyond the age of 14 years	This WebQuest can be seen from different perspectives (modern age or contemporary age) so it can be done in any classroom (14-16+ years old students). This WebQuest makes a connection between historical events and some hot contemporary topics, so it can be put also into the curriculum of civic education	This WebQuest is for the age between fourteen years and sixteen years. The topic is highly sensitive so caution would have to be applied	This WebQuest is suitable for students at the age of 15 and older (9 th grade and higher)	11 th grade - 15 years old under the topic of "Colonial Empires XVII, XVIII XIX centuries"
	The topic is highly sensitive, so it should be presented in an appropriate way. In the countries where the topic of the WebQuest isn't foreseen in the official national curriculum, it can be used as an extracurricular learning/practice activity. The approach is meant for both individual and group-work.				
Religion, Diversity and Tolerance	This WebQuest explores the topics of church and religion throughout history which could be linked to the national curriculum for 8 th graders (14 years old)	This WebQuest can be linked to the curriculum of the fourth grade where our students acquire knowledge about the relations between the State and the Church (16+ years old students). It can be put also into the curriculum of civic education/citizenship	Fourth year – the age of sixteen years. Religion is covered in the lower classes, the age is twelve years up to fourteen years old	This WebQuest is suitable for students at the age of 14 and older (8 th grade and higher). It is linked with some topics of the official national curriculum (From Justinian's death to the restoration of icons and the treaty of Verdun; From the east-west schism -split of the two churches- to the fall of Constantinople)	9 th and 10 th grade – 14/15 years old students
	The WebQuest could be used as additional learning material.				

	The approach involves both individual and group-work.				
Living in Ancient Rome	Ancient Rome is not a topic that is specifically covered in Bulgarian high schools. However, the curriculum envisages exploring the topic of Bulgarian's lands throughout major historic events as part of 10 th graders history lessons (16 years old). Therefore, this WebQuest could be used for this topic	Ancient Rome is a topic of the first year of the Italian curriculum (for all the typologies of schools) (14 years old)	This topic is covered in the school curriculum. The WebQuest is suitable for first year pupils aged thirteen to fourteen years	This WebQuest is suitable for students at the age of 14 and older (8 th grade and higher)	This WebQuest can be applied in different years of History lessons in 7 th grade, 12 and 13 years old. This is also a part of different curricula approaches mainly with Music and Dance students. It also suits the Culture Heritage curricula for the secondary level, 15 years old and History at the same level and age
The WebQuest could be used as additional extracurricular activity and learning material. The approach is suitable for both group and individual work.					

Geography

Almost all WebQuests linked to **Geography** are suitable for the official school curricula in the countries involved in the sCOOL-IT project and for students at the age of 12-16 years. Their applicability is further specified in the remarks given below:

WebQuest title	Level of applicability in the national school curricula				
	BG	IT	NL	CY	PT
And the winner is...	Although details of the European region are explored in more details in 9 th grade, this topic is suitable for a wider range of students and can be easily adapted for 14-16 years old students. This WebQuest builds on already existing knowledge which makes it applicable to all grades in comprehensive schools	1 st year of the secondary school, but the topic is even suitable for a wider range of students and can be easily adapted for 14-16 years old students	This WebQuest is quite difficult for the pupils at the practical school	This WebQuest is suitable for students at the age of 14 and older (8 th grade and higher). The official national curriculum includes many topics related to Europe: this WebQuest can be used as additional learning/practice material or as an exercise.	Students at the age of 14 and older (8 th grade and higher)
	This WebQuest can be used for a wide range of students, . The approach involves mostly group-work.				
Time zones, DST and the Flat Earthers	This WebQuest covers the topic “movement of the Earth” that belongs in the curriculum of the 8 th grade (14 years old)	1 st year of the technical schools and the second year of the lyceums (14 15 years old)	This WebQuest is quite difficult for the pupils at the practical school. Time zones are covered in the lower school, age group twelve to thirteen years old	This WebQuest is suitable for students at the age of 14-16 and older because it stimulates not only the student’s development of theoretical knowledge but also critical thinking.	7 th grade - 12 years old

				The topic itself is not part of the official national curriculum, however it is part of the wider topic 'The Earth'	
	<p>This WebQuest covers the topic "Movement of the Earth"; it also covers some controversial issues that are suitable for developing critical thinking. In this sense, this WebQuest is applicable to a wider age group and can easily be used for high school students of all grades. This WebQuest can be used as additional learning/practice material and as an exercise. The approach involves mostly group-work.</p>				
How to plan a city from the future	<p>This WebQuest builds on several topics that are covered in the national curriculum for all grades in high school in the countries involved in the sCOOL-IT project. Therefore, it would be suitable to a wider age group, mostly as an extracurricular activity or an additional class activity to demonstrate the connection between different knowledge areas</p> <p>The approach involves mostly group-work.</p>				
Climate Change and the mega-glaciers:	<p>This WebQuest explores climate change as linked to the climatic factors that is covered in the national curriculum for 8th graders (14 years old)</p>	<p>This WebQuest could be linked to the national curriculum for second year of the technical schools and third year of the lyceums (15-16 years old students). However, this WebQuest would be suitable for a wider age group since it focuses on an issue that is of universal importance</p>	<p>Third and Fourth year - age is fifteen and sixteen years old</p>	<p>This WebQuest covers topics that are part of the topics 'The Earth' and 'Atmosphere' for students at the age of 14 (8th grade)</p>	<p>9th grade. 14 years old</p>
	<p>However, this WebQuest would be suitable for a wider age group since it focuses on an issue that is of universal importance. Therefore, the WebQuest can easily be used for high school students of all grades. This WebQuest can be also used as additional learning/practice material. The approach involves mostly group-work.</p>				
Deforestation	<p>This WebQuest explores the problems of deforestation. It belongs to the topic of</p>	<p>This WebQuest explores the problems of deforestation. which falls</p>	<p>The topic of this WebQuest isn't taught as part of the official curriculum. It is quite</p>	<p>This WebQuest is suitable for students at the age of 14 (8th</p>	<p>9th grade. 14 years old</p>

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	<p>“global problems of modernity” as part of the national geography curriculum for 8th graders (14 years old)</p>	<p>within It belongs to the topic of “Botanic” that is part of the Italian curriculum which fits in the second year for all kind of school (15 years old students)</p>	<p>interesting and a pupil at the age of fifteen or sixteen years would benefit from this WebQuest</p>	<p>grade)is linked with the official national curriculum’s topic ‘Natural and human resources’. This WebQuest can be used as additional learning/practice material</p>	
<p>It could be used as an additional activity to complement the classroom learning material or as an extracurricular activity. The approach involves mostly group-work.</p>					
<p>A Mission for the International Geographical Union</p>	<p>This WebQuest explores volcanoes, waterfalls and deserts in detail. It fits in the curriculum for 8th graders (14 years old)</p>	<p>This WebQuest fits in the curriculum for the first year of the secondary schools (all kinds) for students of 14 years</p>	<p>This WebQuest would be taught in the lower grades, the age group would be twelve to thirteen years old</p>	<p>This WebQuest is suitable for students at the age of 14 and older (8th grade and higher). It does not apply to the official national curriculum since it is covered in previous grades</p>	<p>9th grade. 14 years old because the topic fits into the part of national curriculum called “Environment and Society - risks and environment”</p>
<p>This WebQuest can be used as additional learning/practice material, for extra understanding and learning about volcanoes, waterfalls and deserts. The approach involves mostly group-work.</p>					

Physics

Almost all WebQuests linked to **Physics** are suitable for the national curricula of the involved countries and for 14-16 years old students. Their applicability is further specified in the remarks given below:

WebQuest title	Level of applicability in the national school curricula				
	BG	IT	NL	CY	PT
What forces are you applying?	This WebQuest explores the topic of forces which is covered in the national curriculum for 8 th graders (14 years)	Second year of the technical schools and first year of the lyceums (14-15 years)	The topic of this WebQuest is covered in the school curriculum. Pupils from thirteen to sixteen years will be involved with this topic. This could also be extended as an extra activity.	This WebQuest is suitable for students at the age of 16 years (10 th grade). This WebQuest can be used as additional learning/practice material.	11 th grade. 16 years old –“Waves and Electromagnetism”
	This WebQuest can also be used for older students, since it involves logical tasks with wider applicability. The approach is mostly at group level.				
How does a LED Flashlight Work?	This WebQuest focuses on “light”, a topic covered in the national curriculum for 10 th graders (16 years)	Fourth year in the lyceums and fifth year in the technical school (16+ years)	The WebQuest is suitable for pupils in the third and fourth grade , at the age from fourteen years to sixteen years.	This WebQuest is suitable for students at the age of 15 (9 th grade)	10 th grade - 15 years old: “energy and electrical phenomena”
	This WebQuest is suitable as additional learning material that complements what is taught in the classroom: it can be used for extra and fun learning/practice. The approach involves mostly group-work.				
History of the atom	This WebQuest focuses on the atom, a topic covered in the national curriculum for 10 th graders	Fourth year in the lyceums and fifth year in the technical school (16+ years)	This WebQuest focuses on the atom which is briefly covered in the school curriculum. Pupils in higher grades will be taught about	This WebQuest is suitable for students at the age of 16 (10 th grade)	10 th grade. 14-15 years. – “History of the atom – chemistry elements and its organization”.

			it, aged fourteen to sixteen years		
	This WebQuest would also be suitable as an additional task to the textbook material or as an extracurricular activity. The approach involves mostly group-work.				
Nuclear Energy And Nuclear Power	This WebQuest explores the topic of nuclear energy, related to “nuclear reactions”, part of the national curriculum for 10 th graders (16 years)	Second year of the secondary school (15 years)	The topic of this WebQuest is covered in the school curriculum. It is taught to the upper grade pupils, from fourteen to sixteen years	This WebQuest is suitable for students at the age of 16 (10 th grade). It is linked with the topic ‘Nuclear reactions’ of the official national curriculum. This WebQuest can be used as additional material.	8 th and 10 th grades 13 and 15 years old “Nuclear energy and nuclear power”
	This WebQuest would also be suitable for this age group and as learning/practice material, additional to the textbook lessons. This WebQuest can be used as part of the students’ teaching process. The approach involves mostly group-work.				
The Depths Of The Universe	This WebQuest focuses on the universe. It is linked to the topic of “Stars, galaxies, universe” covered in the national curriculum for 10 th graders (16 years)	This WebQuest is linked to “Astronomic geography” in the Italian national curriculum. It can be used for students of 16 years.	The topic of this WebQuest about the universe would be taught to the upper grades, but it is quite difficult. The age of the pupils will be around fourteen and sixteen years	This WebQuest is suitable for students at the age of 16 years (10 th grade). The topic is not part of the official national curriculum	9 th and 10 th grades - 14-16 years. “Movements on Earth-movements and forces” 7 th grade - 12 years old. “Universe”
	This WebQuest would be suitable as additional learning material that complements what is taught in the classroom or as an extracurricular activity. The approach involves mostly group-work.				
Weight and measures	This WebQuest explores the topic of weight and measures which is not specifically covered in the national curriculum in physics. Nevertheless, the WebQuest could still be	First year of the secondary school (14 years old). It can be linked with “The International System of Units” and “Analog and digital measuring instruments”	The topic of this WebQuest is covered in the school curriculum. It will be taught to third- and fourth-year pupils, at the age of fourteen to sixteen years	This WebQuest is suitable for students at the age of 14 (8 th grade). The topic covered is not part of the official national curriculum, but could be	9 ^h grade - 14 years old

	used as an extracurricular activity, Its applicability will depend on the teacher’s ability to link it to other learning subjects	which are embedded in the national curriculum		linked with the ‘Forces’ topic	
	The WebQuest can be used as additional learning material and for an extracurricular activity to demonstrate the practical use of weight and measures. The approach involves mostly group-work.				

Philosophy (incl. Citizenship)

Not all the developed WebQuests fall strictly into the topics covered by the national curricula. However, the questions and problems they explore are applicable to a wide age range and could be easily included as extracurricular activity or within Civic Education and Citizenship curricula, other than Philosophy. See below for details:

WebQuest title	Level of applicability in the national school curricula				
	BG	IT	NL	CY	PT
Do you like Street Art?	This WebQuest raises the debate on the validity of street art as opposed to classic art and world-famous artists. The topic is not directly related to any of the topics covered by the national curriculum	The topic is not directly related to any of the topics covered by the Italian curriculum	The topic is not directly related to any of the topics covered by the Dutch curriculum	In Cyprus, philosophy belongs to the 10 th grade’s curriculum. Therefore, this WebQuests may be suitable only for students at the age of 16 years and older	11 th grade - 15-16 years old; “Aesthetics Dimension – analysis and understanding of Experimental Philosophy (Philosophy of Art)”.
	This WebQuest can be a good addition to the philosophy lessons of all high school students regardless of their age as it provokes critical thinking, analytical and debate skills. It can be seen as a transversal topic related to “general culture” (What is Art? What is the value of art?) and can be done as an extracurricular activity for all high school grades, because it covers topics and raises discussions related to our modern world and helps the				

	<p>students develop their analytical skills, having a better understanding of the world in which they live The approach is combined: individual and group-work.</p>				
<p>The ethics of ethical hacking and hactivism</p>	<p>This WebQuest explores Ethics and Morality. In the Bulgarian national curriculum the subject is covered in the philosophy lessons of 9th graders (15 years)</p>	<p>The WebQuest can be a starting point to discuss the difference between ethics and morality. Therefore, the WebQuest would be suitable for all high school grades students either as part of philosophy classes or as an extracurricular activity</p>	<p>The topic of this WebQuest is not covered in the school curriculum. It could be introduced as an extra activity, due to its value. This could be used in the upper grades, age group, fifteen to sixteen years.</p>	<p>In Cyprus, philosophy belongs to the 10th grade's curriculum. Therefore, this WebQuests is suitable only for students at the age of 16 years (10th grade) and older</p>	<p>Tenth grade - 14-15 years - "The personal and social dimension of ethics." "Themes and Problems of the Contemporary World"</p>
<p>This WebQuest poses questions that could be of interest to a much wider age group. Therefore, the WebQuest would be suitable for all high school students either as part of their philosophy classes or as an extracurricular activity. It can be seen as a transversal topic related to "general culture" (ethics and morality) and can be done as an extracurricular activity for all the high school grades, because it covers topics and raises discussions related to our modern world and helps the students develop their analytical skills, having a better understanding of the world in which they live. The approach is combined: individual and group-work.</p>					
<p>Present Implications Of Phillipa Foot's "Trolley Problem"/ Self-Driving Cars – Yes Or No?</p>	<p>This WebQuest explores an ethical problem. It could be linked to the topic of ethics and morality that is covered in the philosophy lessons of 9th graders (15 years old). However, the WebQuest poses questions that could be of interest to a much wider age group</p>	<p>The WebQuest can be a starting point to discuss the difference between ethics and morality. Therefore, the WebQuest is suitable for all high school students either as part of their philosophy classes or as an extracurricular activity</p>	<p>The topic of this WebQuest is not covered in the school curriculum. It could be introduced as an extra activity, due to its topic. This could be used in the upper grades, age group fifteen to sixteen years old</p>	<p>In Cyprus, philosophy is part of the 10th grade's curriculum. Therefore, this WebQuests are suitable only for students at the age of 16 (10th grade) and older</p>	<p>Tenth and eleventh grades - 14-15-16 years old</p>
<p>This WebQuest poses questions that could be of interest to a much wider age group. Therefore, the WebQuest would be suitable for all high school students either as part of their philosophy classes or as an extracurricular activity. The approach is combined: individual and group-work.</p>					

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<p>What should I do? Let's think critically and reflectively about right and wrong, good and bad</p>	<p>This WebQuest explores ethical dilemmas and poses questions about good and bad. It could be linked to the topic of ethics and morality that is covered in the philosophy lessons of 9th graders (15 years). The topic, however, is suitable to a wider age group of students</p>	<p>This WebQuest is suitable for all high school students, either as part of their philosophy classes or as an extracurricular activity</p>	<p>The topic of this WebQuest is not covered in the school curriculum. It could be introduced as an extra activity due to its topic. This could be used in the upper grades, ages 15 and 16 years</p>	<p>In Cyprus, philosophy is part of the 10th grade's curriculum. Therefore, this WebQuests is suitable only for students at the age of 16 (10th grade) and older</p>	<p>Tenth and eleventh grades - 14-15-16 years old</p>
<p>This WebQuest poses questions that could be of interest to high school students of more ages, since it explores universal issues that go beyond textbook lessons. Therefore, the WebQuest is suitable for all high school students either as part of their philosophy classes or as an extracurricular activity. The approach is combined: individual and group-work.</p>					
<p>The influence of Twitter on modern society</p>	<p>This WebQuest is not part of a specific topic covered in the national curriculum in philosophy. However, teachers could link it to lessons that focus on "communication" (for 14 years old students); "values and norms" & "ethics and morality" (for 15 years old students); "truth and validity" & "civic community" (for 16 years old students). Having this in mind, this WebQuest offers flexible options for teachers to include it in their lessons as an extracurricular activity</p>	<p>This WebQuest is not part of a specific topic covered in the national curriculum in philosophy. Teachers, however, could link it to lessons that focus on "communication" (for 14 years old students); "citizenship"; "ethics and morality" & "media education" (for 14-15 years old students). It can be used as an extracurricular activity or within Civic Education curriculum</p>	<p>This WebQuest is not part of a specific topic covered in the school curriculum. It could be included in the citizenship lesson. It could be taught to all age groups due to its social media background</p>	<p>In Cyprus, philosophy is part of the 10th grade's curriculum. Therefore, this WebQuest is suitable only for students at the age of 16 (10th grade) and older</p>	<p>Tenth grade - 14-15 years old The Influence of TWITTER in modern society.</p>

	<p>This WebQuest can be a good addition to the citizenship lessons of all high school students regardless of their age as it provokes critical thinking, analytical and debate skills. It can be seen as a transversal topic related to “general culture” (Themes and problems of the contemporary world) and can be done as an extracurricular activity for all the high school grades, because it covers topics and raises discussions related to our modern world and helps the students develop their analytical skills, knowing better the world in which they live. The approach is combined: individual and group-work.</p>				
<p>Cyber-bullying: the damage to youngsters</p>	<p>This WebQuest is not part of a specific topic covered in the national curriculum in philosophy. Nevertheless, teachers can connect it with certain topics in the curriculum: “social groups and norms”, “conflicts”, “mental health” (for 14 years old students); “values and norms” & “good, evil, virtue” (for 15 years old students); “civic community” (for 16 years old students). Therefore, this WebQuest could be applied as an extracurricular activity for all age groups in high school</p>	<p>This WebQuest is not part of a specific topic covered in the national curriculum in philosophy. It can be used as an extracurricular activity or within the Civic Education and citizenship curriculum.</p>	<p>This WebQuest is not part of a specific topic covered in the school curriculum. It could be used to highlight these problems in a social studies lesson.</p>	<p>In Cyprus, philosophy is part of the 10th grade’s curriculum. Therefore, this WebQuests is suitable only for students at the age of 16 years (10th grade) and older</p>	<p>The damage to youngsters. This theme could be dealt with in group-work: themes and problems of the contemporary world. This is also a very good theme to be developed in Citizenship & Human Rights. 14 – 16 years old.</p>
<p>EPIC narration: what an awful adventure!</p>	<p>This WebQuest is not part of a specific topic covered in the national curriculum in</p>	<p>This WebQuest can be used in the History curriculum. The</p>	<p>This WebQuest is not part of a specific topic covered in the school curriculum.</p>	<p>In Cyprus, philosophy belongs to the 10th grade’s curriculum.</p>	<p>Secondary level – 15 years old</p>

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	philosophy. However, it could still be used as additional learning material or extracurricular activity for students to demonstrate interest in philosophy	WebQuest intends to help students in the study of the epic. In particular, it is focused on the two poems attributed to Homer and Virgil's Aeneid. So it can be used by students in the first or second year of the secondary school (14-15 years old)	The contents are considered too difficult for our level of education.	Therefore, this WebQuests may be suitable only for students at the age of 16 years (10 th grade) and older	
	This WebQuest can be a good addition to the philosophy/history lessons of all high school students regardless of their age as it provokes critical thinking and debate skills. It can be seen as a transversal topic related to “general culture” and can be done as an extracurricular activity for all the high school grades, because it covers topics and raises discussions related to epic, narration and storytelling helping the students to increase their knowledge. The approach is combined: individual and group-work.				

4. Use of Internet-based resources and tools

The main Internet-based resources and tools that can be used, are the following:

4.1. PowerPoint Online (or local application on personal computer)

Use: to present the topic, the theory lessons, to give the students a visual format of the lesson, to show students' presentations

Features: editing, text formatting, simple tables, simple animations, use of other graphic elements (shapes, diagrams, charts), slide layout changes, editing by multiple users.

Pros: Free, simple to use, has many templates and themes available, sharing option, suggest design ideas, Web-based Tool (no software downloading required)

Cons: does not have the same capacity compared to desktop version

4.2. Google Slides

Use: to present the topic, the theory lessons, to give the students a visual format of the lesson, to show students' presentations.

Features: editing, text formatting, simple tables, simple animations, use of other graphic elements (shapes, diagrams, charts), slide layout changes, editing by multiple users.

Pros: Free, simple to use, real-time collaboration option, Web-based Tool (no software downloading required), automatic save, cross-platform availability

Cons: need a Google Account to use Google Slides, limited options for animations and transitions, availability of limited themes

4.3. Microsoft One Drive

Use & Features: Microsoft One Drive is a cloud storage service platform, which allows the users to store their respective files and documents in the cloud, synchronize them and share them across other devices and with other users. Teacher can use Microsoft One Drive to keep online all the classroom's documents, including teaching documents and documents delivered by the students. Microsoft One Drive also integrates the PowerPoint Online (Tool 1).

Pros: Free storage 15GB, easy organisation, collaboration with Microsoft Office apps.

Cons: Privacy concerns because Microsoft has reserved the right to scan files saved in OneDrive to look for what it calls 'objectionable content' such as copyrighted material or explicit images.

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4.4. Kahoot!

Use: Kahoot! is a game-based learning platform, used as educational technology in schools and other educational institutions. It turns the traditional hand raising into a game!

Features: Connects teachers of a school with one license, makes lessons interactive, assesses learning, facilitates collaboration, increased control and visibility.

Pros: Engages students in class and virtually, students can review content and prepare for tests, easily handling of hundreds of teachers, user friendly UI, easy to use, customizable

Cons: Tracking the student's progress level is a complex process.

4.5. Other Internet-based Resources

- ✓ **ERIC - Education Resources Information Center** eric.ed.gov/?q=WebQuest
- ✓ **The School education gateway**, an online platform for school education in Europe www.schooleducationgateway.eu
- ✓ **Amazing Educational Resources** <https://www.amazingeducationalresources.com/>
- ✓ **Photodentro-Cyprus** <http://photodentro.pi.ac.cy/?locale=en>
- ✓ **Bulgaria** <https://ucha.se/> - contains over 21,000 video lessons, tests and mind maps in accordance with the official school program (intended for students of all ages)
- ✓ **Bulgaria** <https://gramoten.li/> - aimed to integrate media literacy fully into the educational process and to increase media literacy in society. Offers a number of resources: games that support the development of media literacy, participatory culture and digital skills in and out of the classroom; activities to build and protect your online presence; handbooks, lessons and presentations.
- ✓ **Bulgaria** <https://teacher.bg/> - aimed at teachers in schools; offers a number of online courses incl. ones focused on innovative schools and development of electronic learning contents.

5. Performance assessment framework

This section aims to help trainers and educators evaluate learners' performance throughout the whole WebQuest development process.

5.1. Rubrics assessment

WebQuests are cross-curricular inquiry-based activities in which learners aren't provided with the "right answers". They are encouraged to search resources on the web and to reflect and form their own understanding of the matters/subjects at focus in the respective WebQuest. Rubrics will help you define clear criteria and standards for evaluation of different aspects of the process the WebQuests' encourages/demands, depending on the activities it involves.

WebQuests involve multi-faceted tasks, which requires flexible types of evaluation, therefore it's recommendable to develop evaluation rubrics for each WebQuest related to the activities stipulated in the process and the expected learning outcomes/objectives. Rubrics represent an authentic assessment tool used for the evaluation of multifaceted tasks which cannot be evaluated objectively against only one criterion or with a subjective score like in the traditional evaluation methods.

5.2. Evaluation of learning achievements

All the sCOOL-it WebQuests foresee criteria for the evaluation. At this regard, we will not dive very deep in the underlying educational theories about evaluation and testing: there's too much out there than we could possibly cover in this small project report.

Instead, we want to concentrate on procedures that enable both students/pupils and their teachers to establish if the learning goals of the WebQuest were achieved and, if so, to what extent. We recommend teachers make use of a combined evaluation procedure, that consists of:

1. Statements by learners (after being asked to do so)

- ✦ telling what they learned about the subject (knowledge-oriented self-evaluation): now (after going through the WebQuest) I know that ...
- ✦ telling what he/she learned about herself/himself (formative evaluation, in this case diagnostic self-evaluation): now (after going through the WebQuest) I know about myself that I ...

This pair of basic statements adds up to a so-called learner report, in which the pupil/student reflects on what the WebQuest brought him/her in terms of acquired knowledge and new personal views and attitudes concerning the subject.

For instance:

- a. 'I learned that in medieval times the hygiene of people was hardly a concern which helped to let epidemic diseases like the Plague cause so many casualties' Or:
'I learned the facts and I know the earth is warming, but I cannot understand why people were so stupid to pollute the world and let it warm up so much.

- b. 'I learned from the information about diseases that this subject is more appealing to me than I would expect in advance: maybe I should consider a medical career'. Or: 'The WebQuests confirms what I thought already: I could not care less about the climate and global warming. In fact, I thought it was all a hoax and I still do!'

This kind of assessment seems more subjective than it actually is: in his standard work on testing and evaluation (and much more), simply called *Methodology* (1974), Prof. A.D. de Groot described how consistent the student's self-evaluations appeared to be: when asked again after 5 or 10 years, their evaluation would almost be the same. De Groot advised teachers to use the learner report as a start for joint evaluations, striving for consensus between teacher and student/pupil about the learning outcomes and their value for the learner, but also compared with the learning objectives as stated in the curriculum.

2. **The learning achievements are visible in the output produced by the students:** it is physical evidence: reports, answers to questions asked in the WebQuest, presentations, performance during presentations (preferably recorded). The teacher completes an evaluation grid stating clearly what the learning outcomes for the student/pupil are. The categories in the grid can be modified by the teacher to cover more precisely the content of a WebQuest.

We advise teachers to use the grid to start a joint evaluation discussion, aiming at consensus or at least understanding between the teacher and the student/pupil about the learning outcomes: were they achieved (as planned in the curriculum and communicated before the WebQuest started) and to what extent? To communicate the learning goals clearly before any learning activity starts, is a transparency requirement that is widely acknowledged in the educational community. The history of making learning objectives explicit goes back to the evaluation 'Bible' by Bloom, Hastings and Madaus: 'Handbook on formative and summative evaluation of student learning' (1971), a standard work that also served as inspiration for the earlier mentioned Prof. De Groot.

The procedure also applies when students/pupils have worked together on a WebQuest. The teacher will ask questions about individual contributions: 'What did you find? What part did you write? How did you find the illustrations? Who made the final presentation?'

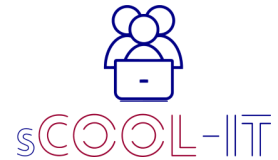
All the evidence (of learning efforts and outcomes plus joint evaluations) is preferably stored in the learning portfolio of the student, or in any other suitable storage system (folders with written or printed documents, online collection of files, etcetera).

Changes in personal points of view and feelings are harder to value and here the consensus between teacher and student/pupil about experiences during learning process provides essential insights.

The grid below gives an example of how the evaluation of the learning process and achievements can be shaped: what kind of reactions to the WebQuest does the teacher expect and how valuable are they? Is the teacher capable to explain the value or score allocated to answers or presentations given by pupils? Does the pupil/student understand the evaluation outcomes, and does he/she agree? If an agreement (consensus is not possible, it is still the teacher who decides how to value the student's work.

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Please note that the text in the grid addresses the pupil/student directly: this is important, and it is in fact a prerequisite for using such an evaluation grid: it is specifically meant to enable a discussion of learning results between teacher and student and not to communicate learning achievements of learners to others who had no direct role in the WebQuest.

Criteria \ Category	Insufficient	Sufficient	Good	Very good
Knowledge	<p>You present little knowledge with low relevance and not in a clear way. You applied very few concepts correctly.</p> <p>You selected information that was hardly relevant and from sources that were not clear. You failed to apply much of it to the subject or theme</p>	<p>You present some of the knowledge you acquired, but not as clearly as possible, and you applied at least some concepts correctly.</p> <p>I You selected information that showed sometimes little relevance from sources that were not all too clear, and you applied some of it to the theme /subject.</p>	<p>You present most of the knowledge you acquired quite clearly, and you applied many concepts correctly.</p> <p>You selected relevant information from some reliable sources and adapted most of it to the theme /subject.</p>	<p>You present all knowledge you acquired most clearly, and you applied all concepts systematically and correctly.</p> <p>You selected the most relevant information from various highly reliable sources and adapted all of it to the theme /subject.</p>
Research & work on assignments	<p>You used just too few resources on the internet or elsewhere; the information you gave was hardly relevant to the assignments or questions in this WebQuest.</p>	<p>You used some resources on the internet or elsewhere; the information you gave showed some variety and had some relevance to the assignments or questions in this WebQuest.</p>	<p>You used a good number of internet and other resources; the information you gave was adequate, showed good variety and your answers were relevant for the assignments and questions.</p>	<p>You used all internet-based and other resources you needed to provide highly accurate and complete information, showing a good variety in perspectives adding up to most relevant answers to all assignments and questions.</p>
Commitment & contributions	<p>You showed little interest and commitment to accomplish the tasks given, there is doubt that you really understood the assignments and that you were trying hard to find more and insightful information.</p>	<p>You showed interest in the subject and commitment to accomplish the tasks given. You understood the assignments and you tried to find additional and insightful information. It is really a good start, but you can improve.</p>	<p>You showed good interest in the subject and a clear commitment to accomplish all the tasks given. You worked well on the assignments and were able to find essential information. Improvement is hard, but possible!</p>	<p>You showed strong interest in the subject and were driven by motivation to accomplish the tasks in the best possible way. Your work came close to perfection and you presented information as clear as possible. Further improvement is hard to imagine!</p>

<p>Teamwork</p>	<p>You showed little responsibility and hardly any autonomy; you had trouble working with other group members and to respect points of view of others. Your interaction with others was not fruitful or productive.</p> <p>Also you did not respect deadlines as agreed in the group.</p>	<p>You showed responsibility and some degree of autonomy; you cooperated well with the group members and respected the points of view of others. You interacted quite well with others, but the results could have been better.</p> <p>You tried with some success to respect the deadlines as agreed in the group.</p>	<p>You clearly showed responsibility and autonomy; you cooperated very well with the group members and showed clear respect for the points of view of others. You interacted very well with others and the results were as expected.</p> <p>You respected deadlines of the group.</p>	<p>Besides being autonomous, you also encouraged cooperation between group members and explained your points of view to enlighten others. You interacted smoothly with all others and results were beyond expectations.</p> <p>You took to initiative to set the necessary deadlines for all groupwork.</p>
<p>Communication</p>	<p>Your communication is not effective, your statements and requests to others are not understood and you don't care much.</p> <p>Your way of expression is not well suited to the context, both in oral and written form.</p>	<p>Your communication is effective to some extent. However, your requests to others are often not well understood and you could have tried by rephrasing your statements.</p> <p>Sometimes your way of expression is not well suited to the context and therefore somehow unpleasant.</p>	<p>Your communication is quite effective. Your requests are well understood, and you use the answers of team members effectively.</p> <p>Your way of expression fits well in the context and is perceived by your team members as pleasant and correct.</p>	<p>Your communication is highly effective. Your remarks and requests are always well understood and therefor the answers by team members fit perfectly in the context.</p> <p>Your way of expression is completely fine: team members see you as pleasant and correct. You are an asset to your team!</p>

6. Conclusion

6.1. Final remarks



We must proceed, not on the basis of our own ideas
or on our own prejudices, not on preconceived
methods, but by observing the child

Maria Montessori (The 1946 London Lectures, p. 33)



This handbook applies a practical perspective: to help and support teachers and students in a daily application of the WebQuest methodology. Since its appearance, the WebQuest approach was designed for giving a contribution to a more motivating and (why not!) entertaining didactic activity in all topics and learning areas.

In the idea of its creator, Bernie Dodge, the WebQuest is a pedagogical structured and experimented tool, based on work with the computer or other devices. It may facilitate the process of transfer of information and learning by an atypical research activity.

This is the first point to consider: the WebQuest defines an activity, based on work on the web, but pedagogically speaking, work that requires and inspires by a methodological research approach.

For those who consider the use of web-based resources at school as no more than a “copy and paste” action, this Handbook may present useful ideas.

First: Research. This is the first key word of the WebQuest approach. The students are required to

search for information, to read the information and to select what can be considered as reliable and is also related to the area that the WebQuest requires students to investigate. At pedagogical level, this is very relevant, because the students may not be used to verifying what they read. The idea of analysing the source of information can help to develop these soft skills for life, together with the technical and specific knowledge.

Second: Integration of information. Once the students have selected information, they have to compile what they have collected. The activity of systematize information is very important and teaches the student to apply their own ordering principles. This mind-set is useful for their future professional and personal life.

Third: Presentation. Being able to create order in the information for a presentation that serves to introduce the concept that the students have learnt about to others, is very relevant, because the ability and the skills related to showing “what they know” as related to how they present and explain their knowledge, is an important skill.



All of this is related to constructivism, a quite complicated word that we use to say that in all the didactic activities we must make sure that the students are “in the centre of the activity”. WebQuests are applied to use the learner's time in the best way, to stimulate knowledge acquisition and the integration and extending of knowledge. When working with a WebQuest, learners must cope with a significant amount of information and make sense of it (Dodge, 1998). WebQuests help students to develop both critical-thinking and analysis skills. Based on ideas of inquiry and constructivism, WebQuests involve cooperative learning when students work in groups.

WebQuests may inspire students by stimulating creativity and by providing a supportive learning environment.

When we think about a WebQuest we want to be sure that:

- ✓ Knowledge is constructed by the learner. That means that it is built upon previous or other knowledge. The WebQuests facilitates that students take pieces of the information coming from different sources and put them in their own order and conceptual dimension.
- ✓ WebQuests encourage to learn how to learn, while learning. Learning involves constructing meaning and systems of meaning.
- ✓ WebQuests require an active process that involves sensory input to construct meaning. The students are invited to learn in an active way.
- ✓ WebQuests introduce and imply a social activity, where studying is directly associated to connections with other people.
- ✓ WebQuests define the Learning activity as contextual: no one and nothing can be considered as isolated.
- ✓ WebQuests imply also that the knowledge (at the end of the process) is personal. Being based on the learner's personal experience and beliefs.
- ✓ A motivated student learns more effectively and the WebQuest supports this process
- ✓ In this process we have forgotten the teacher! What can we ask a teacher and what can we give him/her when using the WebQuest methodology?
- ✓ The WebQuest challenge requires thorough preparations. The students must be monitored step by step. But doing so and witnessing they are motivated, can motivate the teachers as well. And the preparations and guidance play an important role in the achievement of learning excellence. Motivated teachers are more likely to motivate students to learn inside and outside the classroom. The WebQuest is an important stimulating tool for the teachers.
- ✓ Motivation can help the student to see that the acquisition of knowledge is not an end in itself, but it ensures the use of skills in the future of all those that are involved in this “awful adventure” that we call education.

6.2. Ten reasons for using the sCOOL-IT WebQuests

We conclude indicating 10 compelling reasons for using the sCOOL-IT Web Quests in the classroom:

1. Students learn to be independent thinkers, since most of the problems addressed in sCOOL-IT WebQuests are real-world problems.
2. The WebQuest in itself is a motivational technique to keep students involved in working on a task;
3. WebQuests are an easy way for teachers to incorporate the Internet into the classroom, both for the short and the long term. - No specialised technical knowledge is needed to produce or use WebQuests.
4. Very often, WebQuests involve group activities and stimulate communication and mutual sharing of knowledge. Furthermore, they encourage the use of prior knowledge in new learning activities.
5. WebQuests can be used for specific topics in the national curricula, but they can also be interdisciplinary, involving crossovers to other subject areas.
6. WebQuests encourage critical thinking skills, including comparing, classifying, inducing, deducing, analysing errors, constructing support, abstraction, analysing perspectives, etc. Learners do more than simply repeat the information they find they are guided towards a transformation of that information in order to achieve a given task.
7. WebQuests contain authentic tasks that are motivating They encourage learners to perceive their activities as 'real' or 'useful'. This leads to more effort, greater concentration and a real interest in task achievement.
8. The sCOOL-IT WebQuests are created in a way that allows learners to examine the problem through multiple lenses, stimulating the ability to challenge each other's point of view.
9. In the sCOOL-IT WebQuests learners can propose a solution based on more than one approach. They may solve the problem using more than one solution so the knowledge gained from one problem solving action can be transferred to another situation.
10. The essence of the sCOOL-IT WebQuests is using motivating topics, coupled with up-to-date web resources. WebQuests encourage scaffolded learning (transform what the learners read into some new form) and to achieve all six of Weinstein's key elements (2000): (a) skilful thinking; (b) responsible thinking; (c) non-routine thinking; (d) applying criteria; (e) self-correction; and (f) sensitivity.