



sCOOL-IT

Web Adventure Development Toolkit

Project:
Innovative ICT-based training approach to
reshape school education and training
Intellectual Output 3



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Section A: Introduction to The Web Adventure Development Toolkit

A.1 The Web Adventure Development Toolkit

About the Toolkit

The Web Adventure development toolkit has been developed to achieve these key aims:

- ✦ **Support and equip secondary school teachers** with innovative ICT challenge-based training materials to enrich their pedagogic approach
- ✦ **Create prerequisites for educators** to create own innovative challenge-based teaching resources through the use of ICT
- ✦ **Provide ideas and inspiration** for how teachers can develop and apply WebQuests in their lessons

Who is the Web Adventure development toolkit for?

This toolkit has a special relevance for teachers' work in classroom regarding active methodologies and students' success. But it is developed for everyone who has interest about school active methodologies, classroom management and students' assessment.

What can you find in the Web Adventure development toolkit?

The toolkit is organised in sections where you can find an innovative ICT training approach to face classroom and education in a different way regarding students and teachers' roles throughout WebQuests methodology and pedagogical usage. So, here you can find:

Section A where you can find useful information on what's drawn in the toolkit and how one can use the toolkit.

Section B Methodological fundamentals of WebQuests.

Section C with WebQuests' taxonomy.

Section D providing WebQuests' evaluation.

Section E with WebQuests' designing.

Section F where WebQuests' tails are narrated.

Sections G and H where conclusions and references are presented.

A.2 What you need to know

What is the challenge?

Teachers' work in XXI century is a huge and permanent challenge, since it's important to motivate and challenge students permanently. WebQuests usage is a mean of giving classroom dynamics a new improvement. It also allows students' creativity and classroom innovation both for teachers and students.

What questions do you need to ask?

As a teacher you should be sure that:

- ✓ You know the group of students you are going to work with;
- ✓ You are sure about the contexts of each student, the difficulties your students may have;
- ✓ You make the right choices regarding the curriculum development and approach.
- ✓ You have a clear view of what is expected the students to accomplish;
- ✓ Define a clear WebQuest structure.

How can WebQuests support the Didactics?

A classroom, even though each teacher may have a different definition for this reality, must be a place of innovation; learning, self-discovery; investigation, search, collaborative work; critical thinking; students' active engagement and participation. Also, WebQuests are ruled under those principles since they are important tools to produce contents and results through means of active pedagogy and students' involvement and learning by discovery.

What are the barriers you may have to face accepting this challenge?

Considering teachers' point of view there is the fear of changing classroom discourse and focus. Teachers are also afraid of not being able to give

students the main contents and of not achieving the results they were supposed to achieve.

Regarding students' work there is always the possibility of students not adhering to the proposed tasks mainly because they are not used to new methodologies, and they prefer being taught in a traditional classroom way.

How do we face these barriers?

One should always remain positive and optimistic so those barriers must be seen as very good opportunities of improving and developing new paths of learning/teaching and assessment.

A.3 How can the Web Adventure development toolkit be used?

The Web Adventure Portal toolkit can be used to:

- ✓ Challenge students to work differently in the classroom;
- ✓ Challenge teachers to face classroom from a different point of view;
- ✓ Develop students' skills such as autonomy, critical thinking, analytical thinking, argumentation, teamwork, presentation skills, research skills, debate skills and problem solving among others;
- ✓ Transform classroom management;

- ✓ Practice different ways of assessing and evaluating students' work throughout qualitative feedback;
- ✓ Bring female students to areas related to science, maths, engineering and technology.

Section B: Methodological fundamentals of WebQuests

“

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

Involve me and I learn.

Benjamin Franklin

”

B.1 Introduction

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.

WebQuests give particular importance to the learning process and group dynamics. On one hand, they promote learning and development based on synthesis, comprehension, information transformation and problem solving. On the other hand, WebQuests promote cooperative and collaborative learning, encouraging students to take on different roles. WebQuests can also encourage individual as well as collective work in order to promote learning. They are especially useful as an instrument for active teaching and learning approaches.

A 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 has to involve problem solving, self-judgment, analysis of information and ability to synthesis. The different tasks have to 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 much as possible) a scaled down version of what adults do on the job.

This Kit provides teachers with educational framework. They 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.

B.2 Web-Quests within the collaborative learning approach

WebQuest are linked to the collaborative learning approach to teaching and learning, because the basic idea is that the students gather in groups to jointly solve a “tricky” situation. This is based on the idea that teaching is a natural social act, during which the participants talk to each other.

In all situations of real life, when people have to work in a team, it suggests some relationship and interaction between people that identify human abilities, qualities, the contribution of each to the common cause, etc.

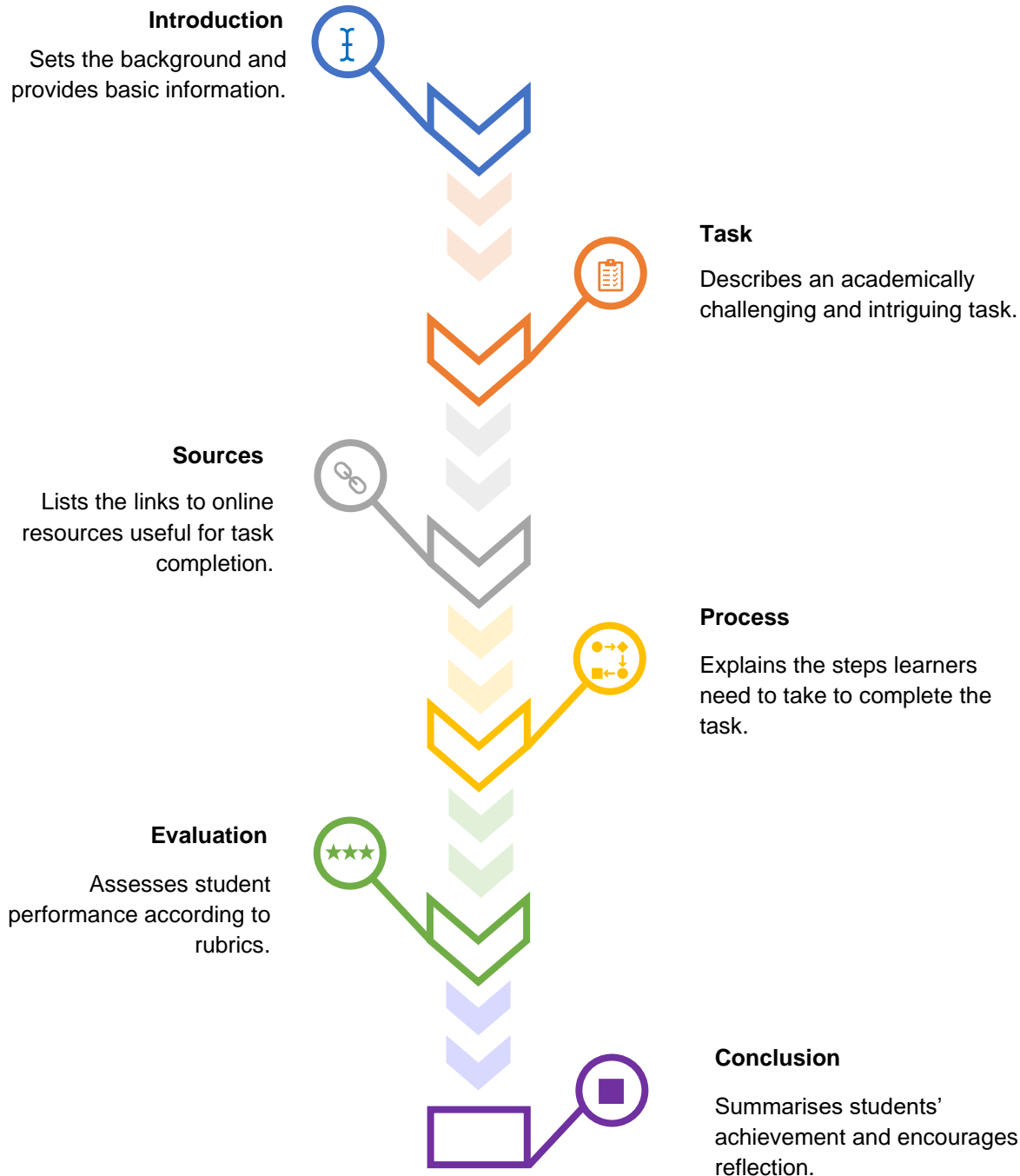
In an atmosphere of collaborative learning, students, in order to perform the WebQuests, have the opportunity to talk to each other, express ideas, argue, share different beliefs, ask about other than their own point of view. That allows the shift from a “teacher-centred” learning to a “pupil-oriented” training.

Thus, the WebQuests can solve the following methodological problems:

- Improving the efficiency of learning. The student learns better if she/he is able to speak, declare, interact with other members of the team;
- Improving literacy of speech and logical communication, developing a joint cognitive activity.

At the basis of the sCOOL-IT WebQuests approach there is the assumption that learning together is not only easier and more interesting but is also much more efficient. And it is important to point out that this efficiency does not only refer to the academic success of students. It also refers to their intellectual development and to their moral development. The learning and discovery process helps others to investigate and solve something together, share the joy of doing a shared educational path.

The structure of the sCOOL-IT WebQuests reproduces the following process:



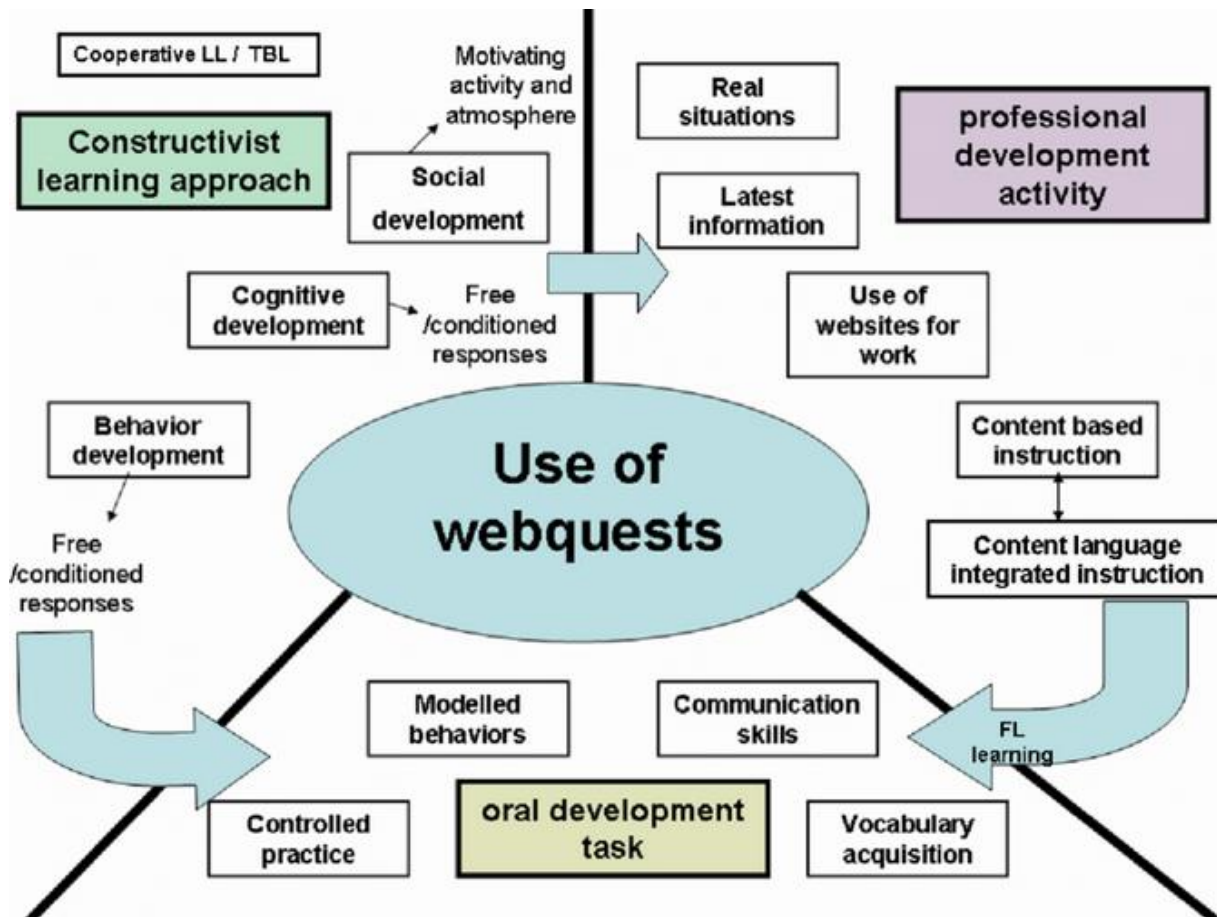
B.3 Pedagogical implications of the sCOOL-IT WebQuests

The underlying reason to use WebQuests is not simply the popularity of the Internet or the Web but rather the pedagogical implications that its use promises to the innovative teacher. WebQuests present a unique opportunity to combine a wide range of effective instructional practices in one activity, integrating technology, scaffolding, collaborative learning, critical thinking, authentic assessment and constructivism all in one seamless bundle.

The three main contributions that WebQuests have on students' learning are:

- [1] Increasing students' motivation to learn through the challenge of confronting authentic tasks, which requires them to solve a problem, to make a comparison, or to construct a hypothesis in relation to a real-life situation using real sources. Students are motivated because the effort that they must put into the given task goes beyond the walls of the classroom. The WebQuest tasks require the students to reflect on their own perspectives, thereby strengthening the link between themselves and the task.
- [2] Developing critical thinking skills again through the use of a real-life situation which requires the students to construct an appropriate solution to a problem. The elements of cognitive psychology and constructivism are embedded into the WebQuest task as the students are not only required to comprehend the collected information but also analyze, synthesize and transform it into something new by adding their own perspectives which becomes evident in the completion of the given task. Scaffolding is another important contribution as students are guided towards the main task step by step, completing one stage at a time. Together these help students develop an in-depth understanding of the main issues they are confronted with through the consolidation of their prior knowledge with the new information they discover. This provides them with coping strategies to use when they encounter a similar issue again in a different context by activating their schemata.
- [3] Creating an opportunity for collaboration as students need to work together to complete the given task, a vital element of the learner-centred approach. Collaborative tasks diminish the feeling of isolation students may have when encountering problems for the first time, as there will be peer support provided through group work. This will also help maintain motivation at a higher level as they must continue to work together toward achieving a common goal.

What follows below is a theoretical diagram of the use of the sCOOL-IT WebQuests:



B.4 The sCOOL-IT WebQuests for fostering group working and critical thinking

The sCOOL-IT model WebQuest can be considered an effective training tool that is characterized by deep assimilation of new knowledge through critical thinking. The idea behind is that the sCOOL-IT WebQuests are supported by four main structures: critical thinking, application of knowledge, social skills and scaffolded learning.

In completing a WebQuest, students need to collaborate and interact with one another to solve a problem through group discussions, thereby

promoting dialogical development. In the group process created by a WebQuest, learners also engage in a dynamic exchange of ideas and the co-construction of meaning and knowledge while making a joint effort to achieve success

Teaching critical thinking skills and application of knowledge must be in a constructivist learning environment that should "engage students and require them to solve problems and build skills that are most meaningful to them".

Theoretically, the sCOOL-IT WebQuests are produced to go beyond the traditional theoretical basis of WebQuests and to think about other aspects of WebQuests as a learning tool. That is, instead of focusing on the components of critical thinking skills and application of knowledge, emphasis is also placed on constructivist learning, which includes critical thinking and knowledge application.

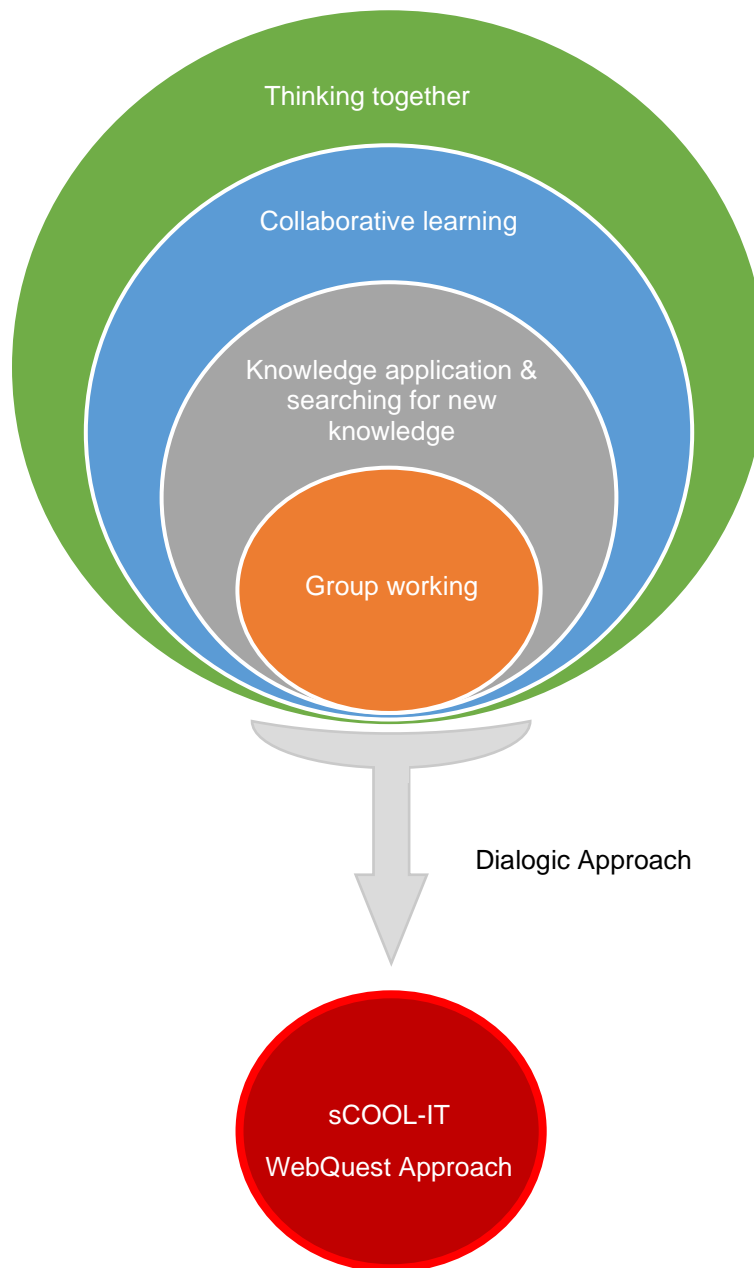
In practice, the sCOOL-IT design of WebQuests has been a complex process that involved careful planning by putting in perspective all the variables that can affect student's learning, including social, psychological, cognitive, developmental aspects.

Furthermore, to assist students in opening a dialogic space and in fostering critical thinking, all the WebQuests pose ill-defined problems to explore. Moreover, they assign students a range of websites

containing multiple perspectives on a given topic to force students to consider alternative perspectives, thereby further broadening the dialogic space and critical thinking in the classroom.

It is worth noting that all (from the work process to the scoring criteria) is analysed from the students' point of view. We can say that we have created student-centred and inquiry based WebQuests, built around a scenario of interest to students, who work in small groups, following the instructions in the WebQuest model. Students collectively contribute to the understanding of issues of considerable widely and deeply. Finally, the formative assessments aim to help students grow, not to notice their mistakes.

Summing up, the sCOOL-IT approach can be summarized as follows:



B.5 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 them enrich their pedagogic approach: promoting better students' performance in general school subjects and developing 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 with the aim 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.

B.6 The role of the teacher and advantage in using the WebQuests

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".

B.7 The role of the student and advantage in using the WebQuests

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 their part in achieving the goal and sharing the knowledge that they have acquired. A WebQuest is effective when it forces students to depend on one another. WebQuests 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.

Last but not least, WebQuests also favour the “learning to learn” competence.

Section C: WebQuests taxonomy

C.1 Introduction

The goal of the introduction of a WebQuest is to make the activity desirable and fun for students. When the activity that is given relates to students' interests, ideas, past experiences, or future goals, then it is inherently more interesting. Therefore, it is necessary to build a motivational introduction that will engage and excite students at the beginning of each WebQuest.

As a teacher, you should keep in mind that the introduction of a WebQuest establishes the connection between the task that follows and your student. If it is catchy and grabs their interest, chances are that students will immerse in the adventure with enthusiasm. If not, they might lose interest and invest less effort in completing the activity. Below are some tips on how to build a catchy and engaging introduction for your WebQuests:

- ✦ Remember your audience: try to make your text learner-centred by writing to the students. Adjust your writing style accordingly and address the students directly.
- ✦ Provide background information and motivational scenarios like giving students roles to play. For example, in the sCOOL-IT WebQuest [Present Implications Of Phillipa Foot's "Trolley Problem"/ Self-Driving Cars – Yes Or No?](#) students are assigned the roles of engineers in one of the world's leading technology companies Tesla, Inc. Thus, from the very beginning of this experience students immerse into a very life-like adventure taking up a specific occupation in a trendy company. These aspects will most likely boost students' motivation to carry out the task that is given.
- ✦ Add real-world components to online investigations for full engagement of the students. Link your topic to something that reflect theirs everyday life or align with their interests or goals. For example, the sCOOL-IT WebQuest [The influence of Twitter on modern society](#) focuses on Twitter as a social media close to the young people of today and uses it as a tool to pose some important questions that they should reflect on.

C.2 Process – types of processes that may be integrated in WebQuest depending on learning objectives

How to construct the process of a WebQuest to ensure that different learning styles are addressed properly? The Institute for Learning Styles Research defines the following types of learners (<https://www.learningstyles.org/styles/index.html>):

Print-oriented learner

Main characteristics:

- Often takes notes
- May like to write on the blackboard
- Remembers quickly and easily what is read
- Learns better after seeing or writing something

This type of learner prefers to have the full text in written form. The advantage for this type of learner is that he/she can go through the WebQuest in the desired pace. Moreover, the learner can go back (or forward) to focus on a

certain part of the text and make sure this part is well understood. For this type of learner, it might be better to have each WebQuest fully printed. On the other hand: online WebQuests are suitable for forward and backward scrolling and reading in one's own pace as well.

Aural learner

Main characteristics:

- Tends to remember and repeat ideas that are verbally presented
- Learns well through lectures
- Is an excellent listener
- Can reproduce symbols, letters or words by hearing them

This type of learner prefers to listen to a text. If a teacher is aware that this type of learner is represented in the class to which a WebQuest is presented, he/she might record the text of the WebQuest in a sound file that can be played on a smartphone, so the learner can use the spoken text next to the written, online version. Note that illustrations cannot be turned into spoken text, so some visual effort of the learner is still required. The recording also has the advantage that it can be repeated as often as the learner likes.

Haptic learner

Main characteristics:

- Likes a "hands-on" approach to learning
- Involves the sense of touch in learning
- Likes to do artwork
- Likes to piece things together

This learner type likes to touch things and for that reason we may also call it 'tactile learning'. It is not so hard to imagine a version of the WebQuests that is suitable for tactile learning: the pupil might benefit from having physical objects to look at and work with. Also, the designer of the WebQuest (teacher) could be keen on constructing assignments that invite the learner to use their hands: experiments in physics, working with real plants and animals in biology. Also inviting experts to introduce and explain a subject (History, Geography) may help to bring the living world into the classroom.

And for all subjects covered, pupils can be sent to the library or to expositions to get information or to even touch the things they see.

Interactive learner

Main characteristics:

- Learns best through verbalization
- Often hums or talks to self or others
- Usually is not quiet for great lengths of time
- Often talks at length...just to hear him/herself talk!

This type of learner prefers to verbalise the contents and discuss it with other learners: he/she tends to be talkative and even makes noises when not communicating (like humming). Most WebQuests deliberately lead the pupils to phrase their findings and thoughts about a subject: the whole process of searching information and rephrasing it in their own words and discussing the contents in a small group or making a presentation of it (which happens in

most WebQuests) is very well suitable for this learner type. Of course, when doing individual work, the pupils may hum or tap their fingers as much as they like.

Kinaesthetic learner

Main characteristics:

- Learns by doing, direct involvement
- Is not very attentive to visual or auditory presentations
- Wants to be “doing” something
- Tries things out and likes to manipulate objects

The typical kinaesthetic learner moves a lot, is a poor listener and will not be very attentive to visual stimuli (presentations) or written information: this pupil needs to be active (tapping on the table or moving around in the classroom) and they are best challenged with assignments that causes them to act physically. For the WebQuests this may call for some adaptations that aim to make these pupils move around and find out by experimenting rather than reading, as far as that is possible. Probably roleplays would fit well with their learning style.

Visual learner

Main characteristics:

- Learns by seeing and by watching demonstrations
- Likes visual stimuli such as pictures, slides, graphs, demonstrations, etc.
- Conjures up the image of a form by seeing it in the “mind’s eye”
- Often has a vivid imagination

This type of learner almost seems the direct opposite of the kinaesthetic learner: this pupil benefits from looking at things (texts, presentations, artwork) and tends to visualise what is being told or written, helped by a vivid imagination. Most WebQuests produced in the sCOOL-IT project will please this type of learner and the basic prerequisite of being an active researcher on the internet, fits this profile perfectly.

Olfactory learner (learns by smelling and tasting)

Main characteristics:

- Learns best through the sense of smell and taste
- Smells have a special significance
- Associates a particular smell with specific memories
- Is frequently able to identify smells
- Finds that smells add to learning

It will be hard to accommodate or even satisfy pupils with this specific learning style in any education format that we know. Again, physical and biological experiments in the classroom in addition to the assignments given in the WebQuests could be helpful. However, if we want to please learners by making them smell or taste things, we may find it difficult to incorporate this in a WebQuest or in any kind of lesson for that matter. Apart from vocational training programmes for future cooks and sommeliers (and similar programs), not much smelling and tasting is involved in secondary education.

C.3 Types of Tasks for a WebQuest depending on what is supposed to be achieved

When you are designing your WebQuest you need to consider its underlying task and what you want to achieve with it. Dodge has identified several tasks, which can be used for a WebQuest. Below you will find a short guide for the different type of tasks for your WebQuests as suggested by Dodge along with some tips and examples based on the sCOOL-IT project experience.

Retelling task

Aim: to make students demonstrate what they have understood from certain information they have absorbed by producing a document, presentation or summary.

When to use it: at the beginning of your WebQuest journey with students. Retelling tasks are close to traditional learning and will make a bridge to the different approach employed by the WebQuest teaching methodology. A retelling task could be used as an interim step to develop background understanding of a topic. A WebQuest based on a retelling task could be combined with other tasks. In the sCOOL-IT project retelling tasks were combined with elements from other tasks to create WebQuests whose first step is to make students gain knowledge on a certain topic and later on build on it. For example, the WebQuest [Do you like Street Art?](#) first introduces the topic of street art asking students to search for information and answer questions related to this contemporary form of art. The WebQuest then unfolds adding elements of persuasion tasks and self-knowledge task to make a more complex WebQuest experience.

Skills a retelling task seeks to develop: summarizing, distilling, and elaborating

Students are expected to produce: PowerPoint or other multimedia presentations, posters, short reports

Tips when designing your WebQuest based on a retelling task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Consider the degree of information transformation required of the students. ✓ Make sure the students understand that their presentations/reports should not be simple copy-paste information from the sources. ✓ Make sure the students are given latitude about what to report and how to organize their findings. 	<ul style="list-style-type: none"> ✗ Avoid setting tasks that require looking for simple, sure answers to pre-determined questions. ✗ Avoid using retelling tasks for knowledge students are already supposed to have and for topics they are familiar with.

Compilation task

Aim: to make students gather information from various sources and put it into a common format

When to use it: when you want your student to familiarize themselves with a body of content from various sources while at the same time making choices about the selection of information and its organization. A WebQuest based on a compilation task would be suitable when you introduce a new topic and would like your students to elaborate on it. A number of WebQuests in the sCOOL-IT project are based on compilation tasks although they are all

combined with other tasks for multi-dimensional experience. For example, the WebQuest **Nuclear Energy And Nuclear Power** starts with a compilation task asking students to compile information regarding nuclear energy power plants from various resources (videos, articles, scientific journals) as a first step leading to a deeper analysis on the pros and cons of nuclear power and the possible implications of using nuclear energy.

Skills a compilation task seeks to develop: skills for organization, selection and exposition of information

Students are expected to produce: a compilation into a unique format, for example a map, an exhibition, a time capsule, etc.

Tips when designing your WebQuest based on a compilation task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Require students to transform the information into a unique format. ✓ Include resources in different formats: scientific texts, videos, poems, journalistic articles, social media posts, images, etc. ✓ Set standards for the organization of the compilation. ✓ Require students to come up with their own criteria for selecting the items they put together and to articulate their criteria. 	<ul style="list-style-type: none"> ✗ Avoid setting a task that would be doable by a simple copy paste of information. ✗ Don't make all the organization and formatting decisions for the students.

Mystery task

Aim: to make students find an answer to a topic by investigating information from a number of sources

When to use it: when you want to evoke interest in a topic that is otherwise unattractive or unpopular with your students. A WebQuest based on a mystery task would be suitable for students of all ages as it relies on stirring their curiosity. This type of WebQuest would also be of use when you have introduced a certain topic and would like to encourage your students to dig deeper and find details not taught in your lessons. There is one WebQuest in the sCOOL-IT project that combines elements of a mystery task with elements of an analytical task. **Genes and Eyes' Colour** challenges students to turn into detectives for a while by investigating the eye colour of the children of famous persons. The key for solving the mystery lies in the application of a Punnett square that will help them define the possible eye colour combinations. WebQuests based on a mystery task would be suitable to use in subjects such as "Biology" or "Physics" where you can provide clues based on scientific knowledge.

Skills a mystery task seeks to develop: skills for gathering and processing information from multiple sources; skills for putting information together by making inferences or generalizations across several information sources; skills for critical thinking; close examination and attention to detail.

Students are expected to produce: an answer to a puzzle/mystery

Tips when designing your WebQuest based on a mystery task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Design a complex mystery that requires investigation of multiple sources. ✓ Create a trail of clues that need to be put together to provide the answer. ✓ Put some false trails to challenge students' critical thinking. 	<ul style="list-style-type: none"> ✗ Don't create a puzzle that can be solved by just finding the specific answer on a given webpage/article/video, etc.

Journalistic task

Aim: to make students gather facts and organize them into a journalistic piece

When to use it: when you want to develop understanding of potential biases in reporting. WebQuests based on a journalistic task are especially suitable for subjects like “History” but could also be applied for other subjects if combined with other tasks. For example, the sCOOL-IT project has one WebQuest in the thematic field “Biological sciences” that employs this method. The WebQuest [Pandemics and COVID 19: past, present and future](#) is based on a combination of a journalistic and a compilation task. The first task for the students is to investigate a number of diseases and gather factual information about them. Once they have established the necessary knowledge background, they are challenged to write a scientific article about the selected diseases, imagining that the article will be published in a scientific newspaper/journal.

Skills a journalistic task seeks to develop: critical thinking, accuracy, critical evaluation of information and ability to distinguish facts, developing awareness for potential bias in reporting

Students are expected to produce: a journalistic article

Tips when designing your WebQuest based on a journalistic task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Make sure your students understand that accuracy is most important in this task. ✓ Provide the right resources, including some that are factual and others that are biased. ✓ Stress the importance of reflecting on your own biases, recognizing them and minimizing their impact in the writing. 	<ul style="list-style-type: none"> ✗ Don't leave too much room for creativity that could affect accuracy

Design task

Aim: to make students create a product or plan of action that accomplishes a pre-determined goal and works within specified constraints

When to use it: when you want to develop practical real-life skills for dealing with challenges in the respective thematic field. These types of WebQuests are suitable for subjects like “Physics”, “Biology” and “Math” although they could also be applied for other subjects as well, especially if combined with other types of tasks. For example, the sCOOL-IT project offers a WebQuest in Geography that is based on a design task. In [How to plan a city](#)

from the future there is a combination of a design task and an analytical task challenging students to develop a city plan that will represent a modern place where everyone can have a better life with minimized environmental impacts. Before doing so students are encouraged to investigate the modern cities’ problems and analyze their implications on people’s lives and on the environment.

Skills a design task seeks to develop: skills for working within pre-established constraints

Students are expected to produce: a product or plan of action

Tips when designing your WebQuest based on a design task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Deliver authentic constraints, close to real life. ✓ Require students to deliver a product that is genuinely needed somewhere by someone. ✓ Set constraints that a person can meet in real life, for example a tight budget, legal restrictions, design criteria, etc. ✓ Make sure that you still leave room for creativity within the restrictions you have established. 	<ul style="list-style-type: none"> ✗ Do not require students to design an ideal product while working within restrictions such as budget or regulations.

Creative product task

Aim: to make students create something within a given format

When to use it: when you want to engage your students into a creative process but still establish certain constraints. A WebQuest based on a creative product task would be suitable when students have already acquired the background knowledge on a certain topic, and you would like to encourage them to express their learning through a creative process at the same time building on what has already been taught. This type of WebQuests is suitable for humanitarian disciplines as they rely on creativity rather than accuracy. The sCOOL-IT WebQuest ***What is it like to live in the Stone Age?*** from the thematic field “History & Cultural Heritage” presents a symbiosis of a retelling task, a compilation task and a creative product task. Students are guided through several steps that start with conducting deeper research into the Stone Age to result in delivering an essay about their experience as a human living during the Stone Age. in this case they have to follow the constraints of the genre of essay writing while at the same time entwining their creativity with the knowledge they have gained in the specifics of the Stone Age period.

Skills a creative product task seeks to develop: creativity and self-expression; skills to deliver a product within a particular format

Students are expected to produce: a product within a given format: painting, play, poster, game, simulated diary, song, etc.

Tips when designing your WebQuest based on a creative product task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Emphasize creativity and self-expression, as well as criteria specific to the chosen genre. ✓ Emphasize the importance of the constraints: adherence to a particular artistic style; use of the conventions of a particular format; internal consistency; limitations on length, size, or scope. ✓ Balance creativity and constraints. 	<ul style="list-style-type: none"> ✗ Don't set too many constraints that would limit creativity.

Consensus building task

Aim: to make students consider and, if possible, accommodate different points of view around a disputed fact

When to use it: when you want your students to consider different perspectives and to develop awareness on the existence of differences in people's value systems. This type of WebQuests is suitable for disciplines like "History". You could apply them when you have already introduced knowledge on a certain topic and would like your students to look at the same events from different perspectives. The sCOOL-IT WebQuest *I can measure my things all over the world! (weights and measures)* falls in the thematic field of "Physics" although there are many historical references. The WebQuests engages students in roles represents Nobility, Clergy and Third Estate and will have to convince the other members of the States-General about the adoption of a particular unit of measurement rather than another.

Skills a consensus building task seeks to develop: practical skills for resolving differences

Students are expected to produce: a common report that has a specific audience (real or simulated) and is created in a format that is analogous to one used in the world outside classroom walls (e.g., a policy white paper, a recommendation to some government body, a memorandum of understanding)

Tips when designing your WebQuest based on a consensus building task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Provide different sets of resources to encourage students to study different perspectives. ✓ Make sure to base your task on authentic differences of opinions. ✓ Make sure to base your task on matters of opinion and fact, not just fact. 	<ul style="list-style-type: none"> ✗ Don't base your task on fiction.

Persuasion task

Aim: to make the students defend a point of view in front of an audience, which should be hostile to the topic to be defended.

When to use it: when you have already introduced the background knowledge of a certain topic and would like your students to go beyond the simple memorizing of the information. This type of WebQuests is suitable for a wide range of disciplines and could be combined with other tasks. In the sCOOL-IT project the WebQuest *Time zones, DST and the Flat Earthers* offers a combination of an analytical task, compilation task and a

persuasion task. At first students are asked to search for and summarize information on the different time zones, daylight saving time policies around the world and the growing popularity of the so-called “flat earth society”. After an analysis of the implications of their finding they are engaged in 2 debates with the task to persuade their peers in the necessity/futility of daylight-saving time as well as in the validity/absurdity of the arguments of flat earthers.

Skills a persuasion task seeks to develop: skills for argumentation skills for developing strategies for persuasion

Students are expected to produce: a convincing case based on their knowledge

Tips when designing your WebQuest based on a persuasion task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Make sure to identify an audience whose opinion on the defended topic is different (either hostile or neutral). ✓ Make sure that the students have the necessary background knowledge to build and defend their case. If necessary, introduce additional resources. 	<ul style="list-style-type: none"> ✗ Avoid making the task a simple retelling of the information your students have absorbed.

Self-knowledge task

Aim: to make students develop a greater understanding of themselves

When to use it: when you want your students to look deeper inside themselves as part of their growing process. This type of WebQuests is suitable for disciplines like Philosophy, Literature and Art. Through this type of tasks, you can encourage your students to set long-term goals and contemplate on their ethics, moral considerations, self-betterment, art appreciation, personal tastes in literature, etc. The sCOOL-IT project has combined self-knowledge tasks with other tasks mainly in the thematic field “Philosophy”. Six out of the seven WebQuests developed in this discipline step on self-knowledge. For example, *Do you like Street Art?* Introduces information about street art making students ask themselves whether this type of art appeals to them. *The ethics of ethical hacking and hactivism* elaborates on ethical hacking. Through the analysis of the implications of the actions of white hackers students come to contemplate on moral issues relevant to today’s society. *Present Implications Of Phillipa Foot’s “Trolley Problem”/ Self-Driving Cars – Yes Or No?* directly poses a difficult question whose answer requires better self-knowledge.

Skills a self-knowledge task seeks to develop: self-improvement; setting long-term goals

Students are expected to produce: rather than a product students are expected to find answers about themselves

Tips when designing your WebQuest based on a self-knowledge task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Make sure the questions the students will ask themselves are complex and have no easy answers. ✓ Try to cover topics that are relevant to today's world. 	<ul style="list-style-type: none"> ✗ Don't ask questions that are too simple and that would elicit short answers.

Analytical task

Aim: to make students find relations like cause and effect and figure out their implications

When to use it: when you have introduced a certain topic and would like your students to pay attention to several issues, identify similarities and differences and understand the implications of both. This task makes the students understand cause and effect relationships. This type of WebQuests is suitable for a wide range of disciplines as you can ask the students to make thorough comparisons between phenomena, models, theories, authors, etc. Most of the WebQuests in the sCOOL-IT project include analytical tasks as they are suitable for all disciplines and allow many combinations with other types of tasks. For example, [From Slavery to Black Lives Matter](#) combines a retelling task on the origins of slavery with an analysis on the implications on today's society. [Climate Change and the mega-glaciers](#) from the thematic field "Geography" offers a combination of a retelling task, a compilation task and an analytical task. It challenges students to find information about the glaciers on Greenland and then analyse the consequences of the melting ice and global warming.

Skills an analytical task seeks to develop: analytical thinking

Students are expected to produce: a product including analysis

Tips when designing your WebQuest based on an analytical task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Make sure your task includes requirements for speculating about possible implications. 	<ul style="list-style-type: none"> ✗ Avoid making students develop a simple analysis.

Judgement task

Aim: to make students evaluate information and take informed decisions

When to use it: when you want your students to exercise critical judgement. There only few WebQuests in the sCOOL-IT project that involve elements of a judgement task. For example, the WebQuest [Deforestation](#) from the thematic field "Geography" is one of the most complex ones developed within the project. It combines elements from a compilation, analytical, consensus building and judgement tasks. As a final step in its implementation the WebQuests envisages a mock trial in which students take on certain roles in a court trial against persons held accountable for the deforestation taking place and its' negative consequences.

Skills a judgement task seeks to develop: evaluation skills

Students are expected to produce: evaluation

Tips when designing your WebQuest based on a judgement task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Make sure to present information to be evaluated. ✓ Make sure to provide plenty of information on the topic from various sources so that your students can take informed decisions. 	<ul style="list-style-type: none"> ✗ Don't involve students in judgement tasks if you have not provided them with enough background information to perform their complex evaluation.

Scientific task

Aim: to make your students practice at doing real science

When to use it: when you want your students to discover their inner scientist by gathering, testing and describing some real data. These types of WebQuests are suitable for disciplines like Biology and Physics but could also be applied in other disciplines if combined with other tasks. The task requires comparison of data obtained from a variety of sources and students need to decide, which to support by describing their results and implications in a scientific report. The WebQuests *What forces are you applying?* (from the thematic field “Physics”) and *Ecosystem On Mars* (“Biological sciences”) are based on scientific tasks challenging the students to discover their inner scientist.

Skills a scientific task seeks to develop: research skills

Students are expected to produce: a scientific report

Tips when designing your WebQuest based on a scientific task:

DOs	DON'Ts
<ul style="list-style-type: none"> ✓ Make sure your task is as realistic as possible. ✓ Encourage your students to make hypotheses based on an understanding of background information that is available in various resources. ✓ Encourage the students to test their hypotheses. 	<ul style="list-style-type: none"> ✗ Do not base your task on data that is too well known.

The table that follows provides an overview of all WebQuests developed within the sCOOL-IT project and the type of tasks they are based on. For further reference, please visit our Web Adventure platform: <https://scool-it.eu/webquests/>

Name of the WebQuest	Retelling Tasks	Compilation Tasks	Mystery Tasks	Journalistic Tasks	Design Tasks	Creative Product Tasks	Consensus Building Tasks	Persuasion Tasks	Analytical Tasks	Judgment Tasks	Scientific Tasks	Self-knowledge task
Mathematics & Logic												
Math helps the Good neighbourhood					<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>			
Rational inequalities - The inequalities of the second degree		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>							
Trigonometric functions of an acute angle		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>							
Quadratic functions		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>							
Pythagoras still exists!!! Application of his Theorem in my life	<input checked="" type="checkbox"/>											
First-Degree Equations		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>							
History & Cultural heritage												
Religion, Diversity and Tolerance	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>			
National history – just a modern invention?		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
From Slavery to Black Lives Matter	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>			
Industrial Revolution and technological unemployment.		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			

Name of the WebQuest	Retelling Tasks	Compilation Tasks	Mystery Tasks	Journalistic Tasks	Design Tasks	Creative Product Tasks	Consensus Building Tasks	Persuasion Tasks	Analytical Tasks	Judgment Tasks	Scientific Tasks	Self-knowledge task
Are robots going to take our jobs one day?												
Living in the Ancient Rome		<input checked="" type="checkbox"/>										
What is it like to live in the Stone Age?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>						
What problems did democracies face in the 1930s XX.?		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
Biological Sciences												
Ecosystem On Mars					<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>	
Pandemics and COVID 19: past, present and future		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>								
Fractals – Geometry Within Us		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
The human body	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
Why do muscles hurt when you run too fast?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
Genes and Eyes' Colour			<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			
Physics												
What forces are you applying?		<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>	

Name of the WebQuest	Retelling Tasks	Compilation Tasks	Mystery Tasks	Journalistic Tasks	Design Tasks	Creative Product Tasks	Consensus Building Tasks	Persuasion Tasks	Analytical Tasks	Judgment Tasks	Scientific Tasks	Self-knowledge task
How does a LED Flashlight Work?		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>	
I can measure my things all over the world! (weights and measures)		<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
History of the atom		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
Nuclear Energy And Nuclear Power		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
The Depths Of The Universe		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
Geography												
A Mission for the International Geographical Union (IGU)		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
And the winner is...		<input checked="" type="checkbox"/>										
Time zones, DST and the Flat Earthers		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Climate Change and the mega-glaciers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			
Deforestation		<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
How to plan a city from the future					<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>			

Name of the WebQuest	Retelling Tasks	Compilation Tasks	Mystery Tasks	Journalistic Tasks	Design Tasks	Creative Product Tasks	Consensus Building Tasks	Persuasion Tasks	Analytical Tasks	Judgment Tasks	Scientific Tasks	Self-knowledge task
Philosophy												
Do you like Street Art?	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
Cyber-bullying: the damage to youngsters	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
The ethics of ethical hacking and hacktivism								<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
The influence of Twitter on modern society		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
Present Implications Of Phillipa Foot's "Trolley Problem"/ Self-Driving Cars – Yes Or No?									<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
What should I do? Let's think critically and reflectively about right and wrong, good and bad.		<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>
EPIC narration: what an awful adventure!		<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>			

C.4 Resources: Criteria for choosing reliable web-based resources for the WebQuest

Why the selection of the web resources is important in the definition of a WebQuest

The heart of the WebQuest is the resources. Thus, educators developing WebQuests must locate excellent resources from reliable sources which have a high potential to remain online over time.

Good and well-structured WebQuests facilitate meaningful use of the Web for educational ends. Students have to take advantage of Internet resources that are interactive, media-rich, contemporary, contextualized, or of varied perspectives.

As WebQuest resources are selected in advance, students will spend most of their time working with information rather than looking for it. There are several advantages to using pre-selected resources:

- No time is wasted on hit-and-miss Google searching
- Guarantees that students will use only high-quality information
- Use of Internet resources is more focused, as learners are less distracted by irrelevant websites
- Encourages students to look at several sources of information on a topic, not just the first site they find
- Builds learners' confidence in conducting successful online research
- Select resources that deal with the topic from a variety of viewpoints, offering a mix of fact and opinion.
- Encourage students to look at several sources around a topic.

Through the WebQuest resources, learners will become aware that the Internet is not the 'font of all knowledge', and gain experience of synthesizing information from a variety of sources – as problem-solvers must do in the real world.

Of course, sources may include websites, online databases, books, newspapers. But finding useful websites, pitched at the right level for the targeted students, can be a challenge. It's very important to choose and focus on reliable sources of information, produced or managed by trusted organisations and/or websites and databases.

Furthermore, news sources are particularly useful, where a topic is subject to frequent change or attracts a great deal of media attention.

We present here below some general conditions that a qualitative WebQuest project should accomplish:

General pedagogical conditions:

- A well-designed WebQuest offers learner content and resources in a contextual way. It lets students learn about a topic as part of a larger context. In some cases, it's important to find resources that let students explore a topic as interdisciplinary problem to be solved
- Good Resources for a WebQuest have a "hook" that means a motivating starting point or a desirable ending point which ought to be interesting for the student. This can be a resource that captures the student's interest (an on-line game, news, an info-graphic...)
- Good WebQuest' resources also rely on materials that are age and ability appropriate. The web contains everything from nursery rhymes to postdoctoral papers, and finding suitable resources is a demanding task for a teacher. With a successful collection of links a WebQuest can offer suitable demands to students with varying skills and it can be a tool to differentiate the instruction



Finally, it has to be pointed out that the web-based resources are a fundamental element for fostering the critical thinking skills of the students while they use the WebQuest approach. Indeed, critical thinking has been widely acclaimed as an essential educational outcome for students at all levels and in all disciplines (Horvath & Forte, 2011; Reed & Kromrey, 2001) since it helps students gain a deeper understanding of the presented information (Dwyer, Hogan, & Stewart, 2012), develops their decision-making and problem-solving skills (Gambrill, 2006; Ku, 2009), increases their motivation to learn and improve their ability of thinking and analyzing critically about their own learning (Phan, 2010). Hence, numerous studies have focused on different instructional interventions designed and implemented to promote critical thinking development of students.

Choosing reliable web-based resources requires students to evaluate Internet information and consider a multitude of viewpoints and ideologies, thereby potentially fostering critical thinking. In a similar vein, some researchers point out that a dialogic perspective on the Internet posits that it 'is not so much a "tool of tools" [as] a cacophony of voices offering countless opportunities for dialogic engagement with multiple perspectives on every topic, which suggests that teachers should expose students to a variety of online resources to stimulate thinking about varying perspectives.

One way of broadening the dialogic space in the classroom is to select, in each WebQuest, a range of resources so to engage the students with multiple perspectives. This way, the WebQuests constitute a powerful and effective tool for fostering and cultivating critical-thinking skills.

General methodological conditions and cognitive features when choosing reliable web-resources for a good WebQuest

Some general methodological conditions that need to be taken into consideration when choosing web-based information sources can be defined as the following:

- A web resource can be used at best when it relates also to the curricular continuum.
- Some of the selected web resources have to foresee teamwork rather than individual work.
- Well-chosen web resources have to be highly visual. The web is a visual medium, and with proper use visual elements one can build context for learning, visual elements may also influence to students' interest on the issue.
- Good web resources have also to be easy to use. Students should be able easily to understand the contents of the resources in order to accomplish the WebQuest tasks.

In synthesis, the web resources should:

- Match and give a wider explanation for the task realization
- Be strictly necessary for getting the task done
- Be sufficient and grouped by logic criteria
- Be intuitive and Integrated one another
- Offer guidance for the activities that involve cooperation of students or groups
- Address specific needs and interests

Furthermore, some cognitive features when choosing reliable web-resources for a good WebQuest are to be considered:

1. **Logical meaning.** The WebQuest can constitute in itself an "epitome" or pre-organizer of content knowledge and investigation activity. In a WebQuest the teacher can structure the contents in a

comprehensible way for the students, provided with a logical sense that it is conceivable to students. With use of different kind of web-based resources it's possible to model the knowledge structure of the discipline.

2. **Psychological meaning.** With suitable selection of resources a WebQuest allows to construct a learning activity that is adapted at the student's psycho-evolutive level. For further development of knowledge and skills the task should require group investigation that leads to what Vygotsky calls "Zone of Proximal Development" (to the level in which a student performs better with the aid of more capable peer than by himself/herself)
3. **Self-directed learning.** In the WebQuest the student's fundamental work is autonomous: he/she is the one who selects the information that considers relevant; and also the one who structures knowledge, building his/her own cognitive schemes. For this reason, the web resources should be chosen in a way that they can support the student to synthesize, summarize, analyse and compare different sources and means of information
4. **High "social functionality" of the learning.** The ecological-contextual paradigm of learning proposes the necessity to consider in the educational process the point of view of the utility of certain knowledge for the student, considered from the "social ecosystem" in which the student is included. In this sense the use of the Internet as a learning tool is of great relevance to students. It may lead to learning processes that are applicable to other non-academic scopes: way of leisure, autonomy when solving school tasks, etc. This could also lead to high level of learning motivation.
5. **Metacognition.** With WebQuests one should create complex learning situations where students are expected to autonomously conduct their learning based on discovery and effective use of ICT. In this sense through the well selected web resources students can gain comprehensive self-knowledge regarding their own learning.

Some tips for an effective Internet searching

Information available on the web can seem endless and it is easy to get lost online, which can easily get off track and waste valuable time. There are many useful techniques that can help in finding good on-line resources. Below are presented some tips about finding, evaluating and managing the web resources:

- ✦ Take clues about the origin of information from the url, or web address, of the sites you find
- ✦ Make sure the website is kept up to date and that all the links from the page are still active. Well-maintained websites will show a revision date on the homepage
- ✦ Try to judge whether the information is accurate. Anyone can publish information online and it is sometimes difficult to know what's junk and what's worthwhile. The following scheme can give an overview for evaluation any on-line resource:

Name of Site: _____

URL: _____

Critical Questions	Notes
<p>Who wrote/published the information on the site?</p> <ul style="list-style-type: none"> ✦ Who is the author/publisher? ✦ Does the author provide contact information? ✦ What are the author's credentials? ✦ Is the site created or sponsored by a reputable organization? 	
<p>What information and resources does the site provide?</p> <p>Content</p> <ul style="list-style-type: none"> ✦ What is the site's purpose: to persuade, inform, or entertain? ✦ Is the information on the site objective or biased? ✦ Does the site provide thorough coverage of the topic? ✦ Is the information on the site well written? Are there misspellings or grammatical errors? ✦ Does the site provide a works cited page? ✦ Does the site include multimedia elements that help explain the topic? <p>Navigation</p> <ul style="list-style-type: none"> ✦ Is the site organized and easy to navigate? ✦ Does the design suit the purpose? ✦ Are there ads that might distract me? ✦ Does the site take a long time to load? 	
<p>When was the site created/last updated?</p> <ul style="list-style-type: none"> ✦ Does the site indicate when it was first created and last updated? ✦ Do the links work, or do they lead to error messages, such as "Page Not Found"? 	

Why should I use this site?

- ✦ Do the resources on this site meet all my needs?
- ✦ Is the information verifiable, in-depth, and up to date?
- ✦ Why is this Web site a better research source than some of the other sites I've already visited?

Conclusion of a WebQuest

The conclusion of a WebQuest is the part in which students and teachers may reflect upon the experience they had and comment what they liked, what they disliked, what they learned and what they would change in the WebQuest. There are several ways to build a meaningful conclusion:

- ✦ Ask questions for reflection/self-reflection: a good way to finalize the WebQuest experience is through asking the students some questions. It is not necessary that they provide the answers straightaway. For example, the sCOOL-IT WebQuest [From Slavery to Black Lives Matter](#) offers a conclusion that asks a number of questions. They offer students the opportunity to self-reflect on the experience and draw their own conclusions about the lessons learnt.
- ✦ Concluding remarks on the expected learning outcomes: another way to build your conclusion is to summarize the learning path while outlining the knowledge, skills and competences students should have developed along the way. For example, the sCOOL-IT WebQuest [Time zones, DST and the Flat Earthers](#) provides a concluding paragraph that summarizes the learning experience and lists the skills this WebQuest was expected to develop. Similar conclusions were developed for the WebQuests [Genes and Eyes' Colour](#), [National history – just a modern invention?](#) and [Math helps the Good neighbourhood](#) developed within the sCOOL-IT project.
- ✦ It is also possible to conclude the WebQuest by further elaborating on the topic and offering the students paths for additional research if they are up to it. For example, the sCOOL-IT WebQuest [Ecosystem On Mars](#) provides a conclusion that gives additional food for thought on the subject of colonizing other planets. There are also links to websites that would encourage students to dig deeper into the topic and endeavour on their own quest for further knowledge.

Whatever type of conclusion you may choose for your WebQuest just make sure that it is meaningful for the students and offers room for reflection on their web adventure.

Section D: WebQuests evaluation

Regarding this subject of WebQuests evaluation we have to distinguish between students' assessment on the expected learning outcomes/objectives and the assessment of the WebQuest itself. But it is also important to bear in mind how students can or cannot understand the outcomes they achieve.

This work also emphasizes the WebQuests' assessment to know, to understand how they worked for students and teachers, their value. All in all, the given proposals already outlined in the sCOOL-IT Comprehensive Training Programme should be respected and should be considered when preparing evaluation activities.

When you are thinking about WebQuests evaluation you need to consider WebQuests learning process and rubrics role concerning evaluation. In this section you will find a short guide for the different tasks for your WebQuests evaluation along with some tips based on the sCOOL-IT project experience.

D.1 Framework

The testing process could be processed both ways: blended and face to face depending on Corona Virus conditions at schools. Bearing in mind all the challenges you may have to face you can spread the testing over 4 weeks. Each teacher can include students from high school, aged between 13-15 years old. Including two teachers to make the evaluation could be useful for the success of this task. All the teachers involved could be personally informed over the project. This will ensure that the roles are shared throughout the quest. The only issue which one must deal with is the privacy law in each country.

Also, it will be a desirable key point to reach if each responsible teacher could consider drawing a common work plan to be spread over the students and teachers involved and to be accomplished accordingly.

D.2 The terms and conditions of testing

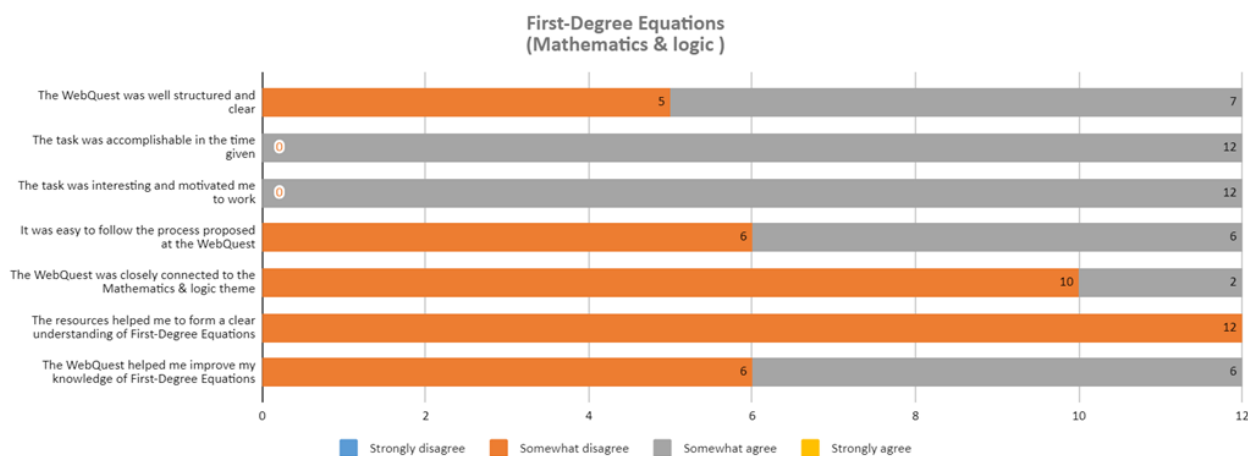
Keep in mind that you can include different age groups and that, pupils could approach WebQuest as you wish, i.e., prepare to test it out. The WebQuests could be tested in more than one classroom, online, and via a video link. Teachers could be present during the testing phase. With each WebQuest the terminology (vocabulary) could really be a big challenge for a pupil at these cognitive levels. By participating actively (the teachers) are also able to adapt the level of terminology (vocabulary) to that of the participating pupil. You should be aware that if it is necessary, you might adapt all the WebQuests.

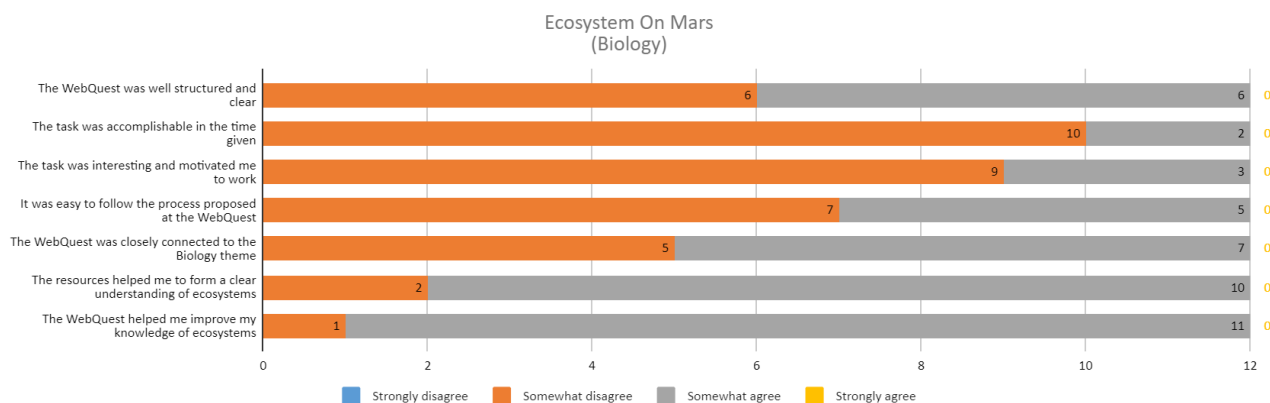
It's also important to be attentive to pupils' reactions to the WebQuest since it is a different form of teaching. The pupils are familiar with a lesson that offers structure, guidance, and specific objectives within a short timetable. The didactics are similar, the class management is different. The pupils could face the WebQuest as a sort of playground, there is lots of noise, lots of pretending to work and dividing themselves into active roles in the group, which poses an enormous challenge. When you think about one of our schools' example our pupils were distracted too easily by the links/films. They found surfing through all the links much more fascinating than completing their part of their task. The terminology caused a lot of problems for the pupils, they did not or could not relate to the word/sentence. Which caused a lot of frustration, which led to a less proactive approach. Once the pupils became bored with asking for help, they quickly filled in an answer (social correct) as to finish off the WebQuest. Some of the pupils found the topics interesting, especially when we adapted them to their level of thinking.

So, it's important to understand those weak points you may also have to face, to be prepared to avoid them before the evaluation work done by the students. In fact, rubrics and WebQuests required a different methodology and approach inside the classroom.

	Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
The WebQuest was well structured and clear				
The task was accomplishable in the time given				
The task was interesting and motivated me to work				
It was easy to follow the proposed at the WebQuest				
The WebQuest was closely connected to the thematic of the given lesson				
The resources helped me to form a clear understanding of the thematic of the given lesson				
The WebQuest helped me improve my knowledge of the lesson subject				

Below you can find some results and the way the students express and analyse the WebQuest. This work was done in one of the schools of the sCOOL-IT Project hoping that they will help you to design your own work successfully:





D.3 The evaluation results

Regarding the WebQuests analyses and work with students, teachers have an important role to give students the best tools, orientation, quality feedback. For this each teacher must possess knowledge about each classroom development, each student’s context, and each one’s level of knowledge on the curriculum. Some of the given WebQuests have plenty of links to explanations and work. However, teachers should manage these resources in order to have a good classroom management and it’s important not to forget that students should select the links they want and should do more in-depth work. In what terminology is concerned it could be a big challenge for some of the students and their ages, this is why teachers’ orientation and guidance are essential.

Section E: Designing a WebQuest

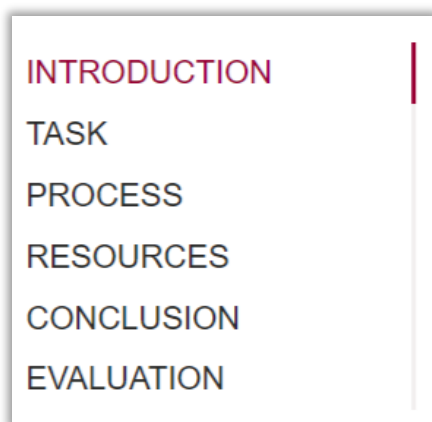
Below we describe the formula for creating a comprehensive and successful online WebQuest.

E.1 Useful tips to Design a WebQuest

Navigation within a WebQuest

Create a navigation block for an easy navigation among the various steps of the WebQuest. The navigation block can be horizontal or vertical and only one step should be visible at the same time.

For example, on the sCOOL-IT Web Adventure Portal a vertical navigation block is used.



It is important to make it clear to users which step they are in, by differentiating the active step from the others. This can be done, for example, by giving the active step a different colour from the rest.

Use a combination of images and text

To make the execution of a WebQuest enjoyable and understandable. The images should always have a caption below or above, explaining to the user what the image shows and what the images' source is.

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There are many websites that provide free access and use to the public a large variety of photos, graphics and icons. Some of them are:

- pixabay.com
- pexels.com
- unsplash.com
- free-images.com
- freepik.com
- flaticon.com
- icons8.com

Split your text in sub-steps

Although you may have the navigation block, it is possible that some of the steps, e.g. the PROCESS step, may contain extended text that may or may not consist of additional sub-steps. In any case it is good to give a structured visualization to the users, so you can create sub-sections or sub-steps within a step.

To achieve this, you can use internally in a step (e.g. in the PROCESS step) a sequence of sub-modules/sub-steps in another navigation block format. Some good solutions are to create tabs or accordion or toggle section.

▲ 1. What is slavery, when did it start and how?

This task may sound simple and easy, but you will have to study the oldest and partly unknown periods in human history, crossing through dozens of centuries. You may have to divide tasks within the group to discover the wide historical context that determined the origins of slavery.

We start with a preparatory assignment, as we need to know what we are talking about:

- a. Define the term 'slave': what is the **essential feature** of a person who is a **slave**?

Your next task is to search for the cultures or civilisations where slavery originated:

- b. In what culture can you find the oldest forms of slavery on earth? When did it happen? Who was allowed or entitled to have slaves? Was slavery common in that society or culture?
- c. One could argue that we owe great achievements to slavery, like the pyramids that people started to build in the early days of Egypt's ancient civilisation. Who was responsible for building the pyramids, the Great Sphinx and other giant monuments? Why did they build them, given that it was such a huge effort?
- d. Religious texts like the Bible and the Koran also mention slavery. There's a famous episode in the Old Testament in which slaves miraculously escape their captivity in Egypt. Tell that story in your own words and explain why these people were slaves. Does the Bible express a judgement on slavery? Is it considered okay, is it condemned, or none of these? Try to find out also what position the Koran takes in this issue.

▶ 2. Reasons for slavery

▶ 3. The consequences or effects of slavery that are still visible or felt today.

For example, on the sCOOL-IT Web Adventure Portal a toggle section is used, which has only one sub-step active and visible each time.

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Resources and other links.

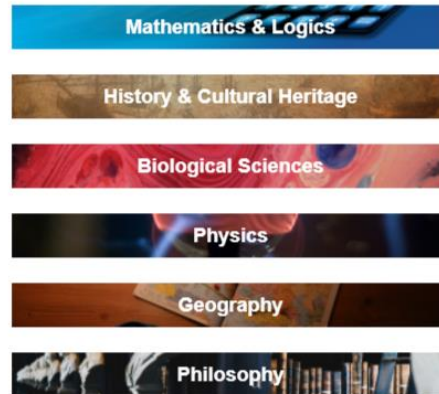
Every link you may use in your WebQuest, either it is part of the Resources step or not, should open in a new browser tab, so the users do not lose their progress. Just use a new tab link for every video, article, paper or online website.

Navigation withing various WebQuests' categories.

It is important for the users to be able to find and navigate to other WebQuests within the same category or other categories at every online page relevant to the WebQuests.

For example, on the sCOOL-IT Web Adventure Portal there is an image on the right of every WebQuest that redirects the users to a specific school subject.

WebQuest Categories



Moreover, at a specific category/subject page the users can be redirected to the other categories/subjects via a list at the bottom of the page.



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E.2 Online Resources and Tools

What you need to create an online WebQuest repository for your students is a website.

There are plenty Content Management Systems that can be used for a website development. The most known are:

- drupal.org
- joomla.org
- wordpress.com

Other useful resources:

- [How to Create a WebQuest with WordPress](#)

Section F: The sCOOL-IT WebQuest tails

In this Section you'll find several testimonials based on the sCOOL-IT pilot experience. The sCOOL-IT partners have tested all WebQuests and have given their feedback in them. Make sure you can prepare your work with your students having in mind some of the given practices below that we highlight.

Subject: Mathematics & Logic

First Degree Equations (Testimonial nr.1)

Description

It was given a labyrinth to the students, who were separated in groups of four. To travel along the labyrinth the students had to solve problems involving 1st degree equations.

Step by Step

Target Group duration and classroom environment

This activity was applied to 14/15 years old students; the duration of the activity was 90 minutes. The group understood the instructions of the WebQuest and started working immediately. The students were very enthusiastic and even the those with more difficulties in the subject wanted to understand and participate.

The Teacher's Role

Some groups couldn't formalize some equations to solve the problems and the teacher provided support to the working groups, to accomplish the goal of the task. The fact the WebQuest presented solutions, and in the form of labyrinth, with an ending, resulted in students not being discouraged when they could not accomplish the task straightaway. On the contrary, it encouraged students to want to understand how an equation could be applied.

The Student's Role

The students showed commitment during the activity. Some groups couldn't formalize the equations and tested the solutions given to find the right one; even though, after finding the right solution they wanted to understand what was the equation needed to solve the problem.

The students remained committed throughout the activity and wanted to take the statements home to check for pending situations.

Evaluation and Feedback for students

All the students liked it and asked to repeat; they complained about the little time they had. They considered the activity fruitful and useful.

Learning Outcomes

Knowledge

Problem solving involving 1st degree equations, solving equations; reading and interpretation of utterances.



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Skills

Group work, critical spirit, develop persistence ability.

Advantages and Testimonials

Activity different from what they have and that encouraged them to apply knowledge.

Working in groups means that students with more difficulties can participate by giving useful suggestions as the context of the problems was related to their daily lives.

First Degree Equations (Testimonial nr.2)

Description

Equations are useful to solve various daily life problems, especially the 1st degree equations which apply to everything, from your supermarket shopping to your future salary! This WebQuest will help the learners to solve simple one and two step 1st degree equations, with many mathematical operations.

Step by Step

Target Group duration and classroom environment

The testing process was performed in the physical presence of students and teachers at the facilities of a training school, Cybernet Zenon, (a certified private institute by the Cyprus Ministry of Education, Culture, Youth and Sports) in Larnaca. This WebQuest's pilot testing lasted 4 hours (half day). The participant students were high-school students, aged between 13-15 years old, and they were also Cybernet students in computer science. The two participant teachers were associate trainers in the training centre.

The Teacher's Role

The teachers belonged one to the theoretical and the other to the technical sector, so they could deliver the WebQuests properly. The teachers were informed about the WebQuest, and the pilot testing process was presented and explained to them, so they were ready to transfer the necessary knowledge to the students. They presented and delivered the WebQuest to the students in Greek language. For this specific WebQuest, the teachers had a more supportive role and a coordination role at the end, when the students presented their results.

The Student's Role

All students were informed about the concept of WebQuests to understand how they would work during the testing. The students conducted extensive research on the First-Degree Equations, solved 14 math exercises in groups of two and of course coloured their maze path.

Evaluation and Feedback for students

The WebQuest evaluation from the students is the following:

The WebQuest was well structured and clear, it was accomplishable in the time given and interesting. It was easy to follow the process proposed, the resources were quite helpful and improved their knowledge of First-Degree Equations.

Learning Outcomes



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Knowledge

- understanding of the meaning of the first-degree equations
- how to solve a First-Degree Equation

Skills

- mathematical & logic skills
- research
- teamwork

Advantages and Testimonials

Student: First-Degree Equations are part of our everyday life. We use them all the time even without knowing that we do that.

Subject: Biological Sciences

Ecosystems on Mars (Testimonial nr.1)

Description

The goal of this WebQuest is to allow students to work collaboratively, use creativity and the internet as a resource, to study the principles and characteristics of terrestrial ecosystems and apply their knowledge, creating a project for a self-sustaining ecosystem that could be taken during a space trip to the planet Mars. To this effect, they must understand the energy flow through ecosystems (energy pyramid, food chains and basic niches (producers, consumers, decomposers). The students were divided into teams, some of which were responsible for studying the conditions on Mars to create an artificial ecosystem, while other teams created an artificial ecosystem that would allow them to survive while traveling on the spacecraft.

Step by Step

Target Group duration and classroom environment:

This WebQuest was applied to students of the 10th year of schooling (secondary school) with an average age of 15 years, during 4 lessons of 45 minute each. The students worked in groups, with great commitment and interest.

The Teacher's Role

Supervisor of the activities.

The Student's Role

The whole activity was centered on the work of the students, who defined the distribution of tasks within the group, respecting the learning rhythms, overcoming the difficulties through inter-help spirit between peers, building knowledge step by step.

Evaluation and Feedback for students

A positive evaluation of the activities carried out and the work carried out by the students is made. Students could have further studied the geological and atmospheric conditions of Mars, but it is not part of the essential learnings



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of the discipline to study the planets, and therefore served only as a motivation for the study of ecosystems, through a case study of the planet Mars.

Learning Outcomes

Knowledge

Acquisition and deepening of knowledge about ecosystems, allowing the study at the level of biological diversity with anthropic interventions that can interfere in the dynamics of ecosystems, systematizing knowledge about biological hierarchy and ecosystem structure.

Skills

Skills were developed in the level of the interpretation of texts, data, experiences, schematics, graphs, research and systematization of information, integrating previous knowledge, to build new knowledge, formulation and communication of critical opinions, scientifically based and related to Science, Technology, Society and Environment (CTSA), the knowledge of different disciplines to deepen biology topics. Working in groups allowed the acquisition of socialization rules.

Tips and Suggestions

There should be a version for the Teacher with some correction suggestions and more specific links. The links should be in charge of each teacher in each country, as there may be some difficulty at the level of the language barrier, or some site is no longer available. WebQuests should be more directed to specific topics of each discipline, because it can be the case (as in this WebQuest) that the themes are not uniformly taught in all countries at the same levels of schooling, in order to allow the crossing of knowledge in an interdisciplinary way.

Advantages and Testimonials

While the WebQuest is available online, it facilitates the teacher's work, easily accessible and motivates students to perform research and group work. Using a script to guide students' work, whether individual or group, is not new. The scripts, starting from a Problem Question, are great tools for the study in Science, guiding the student in his work, which learns step by step, following his learning rhythm, building knowledge centred on the student's own work, which allows them to develop autonomy, making them more responsible in the acquisition of knowledge and allowing better development of skills, being the teacher only a counsellor. The WebQuest being available online, also allow teachers to exchange didactic-pedagogical experiences.

Ecosystems on Mars (Testimonial nr.2)

Description

In this WebQuest the students understood ecosystems in terms of their functioning as self-sustaining communities as part of a secret NASA project that has to design a future mission to Mars.

Step by Step

Target Group duration and classroom environment:

The testing process was performed in the physical presence of students and teachers at the facilities of a training school, Cybernet Zenon, (a certified private institute by the Cyprus Ministry of Education, Culture, Youth and Sports) in Larnaca. This WebQuest's pilot testing lasted 4 hours (half day). The participant students were high-



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school students, aged between 13-15 years old, and they were also Cybernet students in computer science. The two participant teachers were associate trainers in the training centre.

The Teacher's Role

The teachers belonged one to the theoretical and the other to the technical sector, so they could deliver the WebQuests properly. The teachers were informed about the WebQuest, and the pilot testing process was presented and explained to them, so they were ready to transfer the necessary knowledge to the students. They presented and delivered the WebQuest to the students in Greek language. For this specific WebQuest, the **teachers had a supportive role and also they acted as assistants when the students created their presentation.**

The Student's Role

All students were informed about the concept of WebQuests to understand how they would work during the testing. The students conducted extensive research on the concept of the ecosystem, space and space conditions and how an ecosystem can be created. As part of a secret NASA project that has to design a future mission to Mars, the students had to design two sustainable ecosystems – one adapted for the spaceship and the other developed regarding the specific Martian conditions – and then present their ideas to the other students.

Evaluation and Feedback for students

The WebQuest evaluation from the students is the following:

The WebQuest was well structured and clear, it was accomplishable in the time given and interesting. It was quite easy to follow the process proposed, the resources were quite helpful and improved their knowledge of the Enlightenment and the concept of nations.

Learning Outcomes

Knowledge	Skills
- Space	- Research
- Ecosystems	- teamwork
- Planet Mars	- Design of an ecosystem
- Sustainable life	- Presentation skills
	- Critical thinking
	- Communication

Subject: Philosophy

The ethics of ethical hacking and hacktivism (Testimonial nr.1)

Description

The starting point is the hacking of the Twitter account of the President of the United States without malicious purposes. Organized in teams of students, research is carried out on the subject on the internet in the resources made available. The ultimate goal is to hold a debate in which teams of students take reasoned positions, for and against, the practice of ethical hacking.

Step by Step**Target Group duration and classroom environment**

This WebQuest was applied to students of the 10th year of schooling, with an average age of 15 years, during 2 lessons of 45 minute each. The students worked in groups, with great commitment and interest.

The Teacher's Role

Introduction to the WebQuest, teamwork supervisor and debate moderator.

The Student's Role

The whole activity is centered on the work of the students, who define the distribution of tasks within the group, respecting the learning rhythms, relying on overcoming difficulties, building knowledge progressively. Skills and knowledge are put into action in the debate.

Evaluation and Feedback for students

Upon completing this WebQuest students will become aware of the infinite number of morally controversial actions we face on a daily basis. They should be able to make their own opinion on topical issues such as the endeavors for justice of the Anonymous and other related hacktivist formations. By exploring in detail the motives behind such actions and the consequences they lead to, students will develop their critical and analytical thinking. In addition to that, students will become aware of various moral theories and will be able to analyze actions and events from their perspective.

Learning Outcomes

Knowledge	Argumentation
Ethics and moral philosophy	Teamwork
Skills	Presentation skills
Critical thinking	Research skills
Analytical thinking	Debate skills

Tips and Suggestions

There is one aspect that needs improvement: the starting point, the Victor Gevers case and Donald Trump's Twitter account, shouldn't be just that. Because students are left with the perception of being dated. The discussion in the debate should be more comprehensive of the ethical consequences of hacking.

Another suggestion shared was that there should be an orientation of the time of each moment of the activity.

Advantages and Testimonials

“What I like most about WebQuest is starting from a topic that can be close to students, like hacking. It allows exploring, in a contextualized way, programmatic contents of moral philosophy and ethics. Another relevant aspect is appearing in the form of a challenge and then of a debate in which students take opposing positions.”

“The activity was challenging and stimulating. It seems to be a very interesting way to develop skills and knowledge. The impact appears to be very positive.”



“This WebQuest is in line with our school’s priorities. The educational project of the AEJE foresees and well the valorization of new methodologies, executed with technological base, facilitators of the effective digital transition of the practices of the school, therefore, tools like the WebQuest have the potential to captivate the students to learn to learn. Knowing how to be with others and understanding their points of view is an essential skill. We will continue to build bridges to critical thinking.”

The ethics of ethical hacking and hacktivism (Testimonial nr.2)

Description

In this WebQuest the students had to understand what the hacktivism is and make a clear statement of what they believe regarding this. As members of teams, they presented their positions. took part in a debate on ethical hacking and made their views as clear as possible using arguments. For this WebQuest’s purposes, a real fact relevant to the US Presidential elections on 3rd November 2020 is presented.

Step by Step

Target Group duration and classroom environment

The testing process was performed in the physical presence of students and teachers at the facilities of a training school, Cybernet Zenon, (a certified private institute by the Cyprus Ministry of Education, Culture, Youth and Sports) in Larnaca. This WebQuest’s pilot testing lasted 4 hours (half day). The participant students were high-school students, aged between 13-15 years old, and they were also Cybernet students in computer science. The two participant teachers were associate trainers in the training centre.

The Teacher’s Role

The teachers belonged one to the theoretical and the other to the technical sector, so they could deliver the WebQuests properly. The teachers were informed about the WebQuest, and the pilot testing process was presented and explained to them, so they were ready to transfer the necessary knowledge to the students. They presented and delivered the WebQuest to the students in Greek language. For this specific WebQuest, the teachers had a supportive role and also had the role of referee and coordinator in the debate conducted by the students.

The Student’s Role

All students were informed about the concept of WebQuests to understand how they would work during the testing. The students searched information on the different types of hacking, the known different moral theories and the group Anonymous. In order to explore the various aspects of hacktivism, the students were part of either President Trump’s team or Victor Gevers’ (hacktivist) team.

Evaluation and Feedback for students

The WebQuest evaluation from the students is the following:

The WebQuest was well structured and clear, it was accomplishable in the time given and interesting. It was easy to follow the process proposed, the resources were quite helpful and improved their knowledge of the hacktivism and moral theories.

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Learning Outcomes

Knowledge

- hacktivism

Skills

- Research
- Presentation skills
- Critical thinking
- Argumentation
- Teamwork
- Debate skills

Subject: History & Cultural heritage

National history – just a modern invention?

Description

In this WebQuest students explored the concept of “nation” and its roots in the ideas of Enlightenment and discovered its historical origins.

Step by Step

Target Group duration and classroom environment

The testing process was performed in the physical presence of students and teachers at the facilities of a training school, Cybernet Zenon, (a certified private institute by the Cyprus Ministry of Education, Culture, Youth and Sports) in Larnaca. This WebQuest’s pilot testing lasted 4 hours (half day). The participant students were high-school students, aged between 13-15 years old, and they were also Cybernet students in computer science. The two participant teachers were associate trainers in the training centre.

The Teacher’s Role

The teachers belonged one to the theoretical and the other to the technical sector, so they could deliver the WebQuests properly. The teachers were informed about the WebQuest, and the pilot testing process was presented and explained to them, so they were ready to transfer the necessary knowledge to the students. They presented and delivered the WebQuest to the students in Greek. For this specific WebQuest, the teachers had a supportive role and also they acted as assistants when the students created their presentation.

The Student’s Role

All students were informed about the concept of WebQuests to understand how they would work during the testing. The students conducted extensive research on the Enlightenment, Enlightenment Thinkers, and nation’s origins. They discussed, explored Thinkers’ personalities and ideas and revived/impersonated one of the Enlightenment thinkers.

Evaluation and Feedback for students

The WebQuest evaluation from the students is the following:



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The WebQuest was well structured and clear, it was accomplishable in the time given and interesting. It was easy to follow the process proposed, the resources were quite helpful and improved their knowledge of the Enlightenment and the concept of nations.

Learning Outcomes

Knowledge

- Enlightenment
- Enlightenment Thinkers
- nations' historical origins

Skills

- Research
- teamwork
- Presentation skills
- Critical thinking
- Communication

Subject: Physics

What forces are you applying?

Description

In this WebQuest the students learned about forces, the seven types of forces and how to use them to solve everyday problems.

Step by Step

Target Group duration and classroom environment

The testing process was performed in the physical presence of students and teachers at the facilities of a training school, Cybernet Zenon, (a certified private institute by the Cyprus Ministry of Education, Culture, Youth and Sports) in Larnaca. This WebQuest's pilot testing lasted 4 hours (half day). The participant students were high-school students, aged between 13-15 years old, and they were also Cybernet students in computer science. The two participant teachers were associate trainers in the training centre.

The Teacher's Role

The teachers belonged one to the theoretical and the other to the technical sector, so they could deliver the WebQuests properly. The teachers were informed about the WebQuest, and the pilot testing process was presented and explained to them, so they were ready to transfer the necessary knowledge to the students. They presented and delivered the WebQuest to the students in Greek language. For this specific WebQuest, the teachers had a more supportive role.

The Student's Role

All students were informed about the concept of WebQuests to understand how they would work during the testing. The students searched information about the types of forces and how they are connected with the everyday life. Their main role was to observe states and experiments they use every day and make the connection with the forces.

Evaluation and Feedback for students

The WebQuest evaluation from the students is the following:



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The WebQuest was well structured and clear, it was accomplishable in the time given and interesting. It was quite easy to follow the process proposed, the resources were quite helpful and improved their knowledge of the Forces and Newton's second law.

Learning Outcomes

Knowledge

- understanding forces in physics and its seven types
- application of forces to solve everyday problems
- understanding of Newton's laws of motion

Skills

- Research
- Presentation skills
- Critical thinking

Tips and Suggestions

For the teachers: Since the research guidance of this WebQuest is flexible and is depending on the students, teachers should help them on their online or book research.

Advantages and Testimonials

Student: "Not quite sure about the type of force on every single state I observe, but it is nice that now I can observe things in a different way and understand nature's basics."



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Subject: Geography**Time zones, DST and the Flat Earthers****Description**

In this WebQuest the students investigated the concept of time zones and explored some of the consequences of living on a round planet that tends to rotate around the Sun and around its own axis.

Step by Step**Target Group duration and classroom environment**

The testing process was performed in the physical presence of students and teachers at the facilities of a training school, Cybernet Zenon, (a certified private institute by the Cyprus Ministry of Education, Culture, Youth and Sports) in Larnaca. This WebQuest's pilot testing lasted 4 hours (half day). The participant students were high-school students, aged between 13-15 years old, and they were also Cybernet students in computer science. The two participant teachers were associate trainers in the training centre.

The Teacher's Role

The teachers belonged one to the theoretical and the other to the technical sector, so they could deliver the WebQuests properly. The teachers were informed about the WebQuest, and the pilot testing process was presented and explained to them, so they were ready to transfer the necessary knowledge to the students. They presented and delivered the WebQuest to the students in Greek language. For this specific WebQuest, the teachers had a supportive role and also had the role of referee and coordinator in the debate conducted by the students.

The Student's Role

All students were informed about the concept of WebQuests to understand how they would work during the testing. The students searched information on time zones, daylight saving time and the theory that the Earth is flat. As part of groups, all the students had to be able to know the time in specific areas on Earth and at the same time understand and be able to explain how they know it.



Evaluation and Feedback for students

The WebQuest evaluation from the students is the following:

The WebQuest was well structured and clear, it was accomplishable in the time given and interesting. It was quite easy to follow the process proposed, the resources were quite helpful and improved their knowledge of the time zones and the Earth's position around Sun.

Learning Outcomes

Knowledge

- understanding time zones
- Earth's motions
- daylight saving time

Skills

- Research
- Presentation skills
- Critical thinking
- Argumentation
- Teamwork
- Debate skills

Tips and Suggestions

For the teachers: Your help in explaining to students the behaviours and views about the theory that the Earth is flat is important. Your impartial and coordinating participation in the debate is also important.

Advantages and Testimonials

Student: "I really liked my participation in the debate. I had to be very careful what the others had to say and in that way I learned a lot!"



Section G: Conclusion and final remarks

Digital transition is speeding all around Europe, in fact, we are witnessing a moment of digital transformation. Digitalization is driving consumers, companies, and governments in search of efficiency, quality, security, and comfort.

Schools are an important part of the communities in which they are inserted. Schools must be aware of all world changes and must accompany them. That's why, although in different stages of maturity, schools are engaged in developing pedagogical strategies and in transforming classroom environments with new methodologies and approaches. After several schools' lockouts due to the pandemic situation of COVID 19 school organized themselves to provide students tools and hybrid approaches. In fact, innovation is one of the big key points in the sCOOL-IT project, and digitalization is closely linked to it. Regarding sCOOL-IT approach classrooms must be innovative environment where students can think together, can develop collaborative learning, where searching for new knowledge and knowledge applications, develop group working and lead students and teachers to WebQuest methodology. So, WebQuests are being used to make teaching and learning activities available for all. Despite WebQuest methodology "age" when we analyse given testimonials in this project, from the teachers' point of view we can conclude that *the teacher is the one who builds bridges between incidental and intended learning and makes teaching and learning efficient(...)*

- 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

From the students' point of view this project has a huge number of advantages and the WebQuests are highly efficient in:

- Promoting student motivation and authenticity
- Developing thinking skills, by transforming information
- Encouraging cooperative learning and teamwork
- Invoking an entertaining activity, which is enjoyable for students
- Enhancing computer and technological competencies
- Stimulating imagination, creativity and initiative effectively strategy
- Helping students apply, synthesize, analyse and evaluate what they are learning
- Encouraging curiosity, because a WebQuest can include interdisciplinary topics, allowing for a crossover to other departments and subject areas.

Project partners are aware that the developed WebQuests were standardized for all countries involved. However, the partnership is also aware that there are huge differences amongst partners' realities inside the classroom methodologies, curriculum, school year organization and others. Some of the teachers agreed that for some level of pupils, the WebQuests required even more structure and terminology which would be easier to understand. Nevertheless, the main conclusion drawn was that WebQuests methodology developed throughout the sCOOL-IT project is indeed a very good teaching and learning methodology, it develops critical thinking, collaborative work, teamwork amongst other important skills. The WebQuests could be taught in different didactical ways, there was diversity and world citizenship was found in most of the WebQuests. Incorporating a WebQuest into a pupil's curriculum could result in improving students' individual working ethics. Incorporating a WebQuest as a learning



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tool could improve the active role of a pupil, certainly if the pupils work individually on it. Furthermore, this toolkit's presents a powerful and empowering way of developing new learning approaches no matter the country, students' development, or knowledge. It is a big challenge to introduce innovation inside the classroom for all involved in the learning process. By introducing the WebQuest as something which passes into the lifestyle/social environment of a Generation Z pupil, it might be a positive incentive to broaden their way of learning, to increase their skills, improve their planning and boost their cognitive affluence.

Section H: References and acknowledgments

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The background work on the construction and the development of the teachers' toolkit on WebQuests which allow students and teachers to face a new challenge on classroom management, on curricula approach and at learning and teaching improvement were conducted with input from members of the Scool-it Project partnership, National Vocational Secondary School of Computer Technologies and Systems (NPG), FONDAZIONE HALLGARTEN-FRANCHETTI CENTRO STUDI VILLA MONTESCA (CSFVM), PCX COMPUTERS & INFORMATION SYSTEMS LTD (PCX), Agrupamento de Escolas José Estevão (AEJE), Vereniging Ons Middelbaar Onderwijs (Fioretti), EUROPEAN CENTER FOR QUALITY OOD (ECQ).

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