



Guidelines and Recommendations for Further Implementations



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Pictures

iStockpicture, project partners

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1. Introduction

1.1 What is the CrowdSchool Project?

The process of mass digitization in the field of cultural heritage has made a large amount of digital content available online from European Galleries, Libraries, Archives and Museums (GLAMs). The CrowdSchool project brings together experts in the technical, educational and heritage fields. Between 2020 and 2023, Crowdschool will implement a work plan with the school partners of the project to achieve the main objective: to improve the learning experience of students while enhancing the databases of European Cultural Heritage.

1.2 Partners

The partnership is composed of heritage, education, and technical experts, that, from 2020 to 2023, have implemented strategies to enhance the learning experience of students, while promoting European cultural heritage databases.

The Project brings together 10 EU partners, in 6 countries:

Cultural and technical partners:

Dédale (administrative coordinator): Dédale is a European research and production agency based in Paris (**France**), dedicated to culture, technologies and innovation. Its field of activity covers artistic production, local development, events management, research, consulting for public authorities and European institutions. The team has developed an expertise in a wide range of topics including cultural policies, ICT and cultural heritage, European digital libraries, innovative and creative learning, Tourism 2.0, new uses, mobile technologies, and smart cities. Dédale is particularly interested in innovation and new uses in sectors such as urban planning, new media, artistic creation, cultural heritage, and education. In the *CrowdSchool* Project, Dédale plays the role of project coordinator and is also paired as 'cultural partner' to Moderato Montessori Barcelona school.

Michael Culture Association (pedagogical and organisational coordinator): Michael Culture Association (MCA) is a not-for-profit organisation, based in Brussels (Belgium), created in 2007 and the only European trans domain network for Cultural Heritage. It aims to promote European cultural heritage by its digitisation and enhancing the network of European professionals working on digital cultural heritage. MCA gathers members and experts from GLAMs and Research Communities from the EU. MCA manages MUSEU- Hub - Services for museums going digital and aggregating for Europeana. In the *CrowdSchool* Project, MCA offers its wide experience in cultural projects, playing the role of 'cultural' partner and is paired to École Élémentaire Polangis.

European Fashion Heritage Association (EFHA): The European Fashion Heritage Association (EFHA) is an international hub established in Florence (Italy) in 2014 to bring together and engage fashion institutions (both heritage organizations and creative industries) in the valorisation and exploitation of fashion heritage online. Counting more than 40 member institutions from 13 countries, EFHA has become a thriving network, in which fashion brands, cultural institutions, researchers and creatives share experiences and best practices regarding Digital Transformation. In the *CrowdSchool* Project, EFHA offers its wide experience in the culture of fashion and plays the role expert in the management of terminologies in the cultural sector.

National Technical University of Athens: The National Technical University of Athens (NTUA) is the oldest and a very prestigious educational institution of **Greece** in the field of technology. It has contributed unceasingly to the country's scientific, technical, and economic development since its foundation in 1836. The School of Electrical and Computer Engineering (ECE NTUA) is well known in Greece and abroad for the research achievements of its members, which is both of wide scope and high of standard. In the *CrowdSchool* Project, NTUA offers its wide technical experience, providing all the IT support for adapting the *CrowdHeritage* platform to the needs of the *CrowdSchool* Project.

STePS: STePS was established in 2013 and it operates in Bologna (**Italy**). STePS relies on the skills of a group of 6 experts with a thorough experience in the field of European programmes that cover education and training. STePS works nationally and internationally to promote educational research, reflection and rethinking of traditional learning approaches. The activities are centred on the joint development of innovative training resources aligned with the most pressing pedagogical concerns. In the *CrowdSchool* Project, MCA offers its wide experience in cultural projects, playing the role of 'cultural' partner and is paired to Liceo Artistico Arcangeli.

Stowarzyszenie Międzynarodowe Centrum Zarządzania Informacją: The International Center for Information Management Systems and Services (ICIMSS) is a scientific association based in Poland, which pursues interests in information, education, and culture. Its aim is also to promote intercultural communication and research. ICIMSS participates in various projects financed by the EU. ICIMSS creates and administers several portals like Pictures-bank.eu, with over 90,000 online photos with historical descriptions and metadata. In the *CrowdSchool* Project, (ICIMSS) offers its wide experience in cultural projects, playing the role of 'cultural' partner and is paired to Zespół Szkół Drogowo-Geodezyjnych i Licealnych (ZSDGiL).

Primary schools:

École Élémentaire Polangis is a primary school, has 17 classes and approx. 430 pupils aged 6-11. The school is located in Joinville-le-Pont, a neighbouring town to Paris (France). Each year, the school offers its students to discover the cultural places of the capital. The school is also engaged in the certification label "Générarion 2024", an interministerial label which aims to develop links between scholar and sport worlds.

Moderato Montessori Barcelona is the first bilingual school, French-Castilian (with optional Catalan and English), dedicated to Montessori pedagogy in Barcelona (Spain). Located in the Putxet district, it aims to welcome around 60 children divided into 3 different classes according to their age: Children's Community class for children from 15 months to 3 years old, Children's house class for children from 3 to 6 years old, Primary class for children from 6 to 12 years old.

Secondary schools:

Liceo artistico Francesco Arcangeli is a secondary school based in Bologna (**Italy**), specialized in plastic and visual arts. Its educational offer includes curricula in Architecture, Furniture Design, Painting, Sculpture and Decoration, Heritage Conservation, Ceramics Design, Graphic Design, Audiovisual Media Arts. The school originates from the merging of two ancient schools in Bologna: the School of Arts, founded in 1885, and previous Liceo artistico, founded in 1923 (previously a lower course of the Academy of Fine Arts).

Zespół Szkół Drogowo-Geodezyjnych i Licealnych (ZSDGiL): August Witkowski Complex of Schools of Road Building, Surveying and General Education in Jaroslaw (**Poland**) is a secondary school located in the south-east of Poland, attended by young open-minded people of many talents. The school has 800 students, aged 14-19. Students can choose to specialize in science and computer science, life sciences, languages, and humanities. The school also offers a unique specialization for students interested in a career in architecture.

1.3 Project's objectives

CrowdSchool Project relies on the results obtained by the previous CrowdHeritage project, which created the online tool (platform) named "CrowdHeritage" using the power of crowdsourcing to improve the quality of metadata. CrowdSchool aims to propose a new model for:

- Enhancing schools with new interactive methods for increasing the creative thinking skills
 of students, taking benefit of the potential present in the digital repositories of cultural
 institutions
- Creating an innovative tool for applying STEAM Education (Science, Technology, Engineering, Arts and Mathematics) as an access point for guiding students' inquiry, dialogue and critical thinking

1.4 Project's activities

The *CrowdSchool* Project aims at enhancing the learning experience of students using the repositories of digital cultural heritage. *CrowdSchool* builds on diverse digital repositories such as Europeana.

CrowdSchool works with partner schools from the basis of the Project, to guarantee the success of the educational objectives.

CrowdSchool provides educational partners with a unique opportunity to experiment, prototype, and share the results of new ideas based on creative collaborations with local and international cultural professionals. And most importantly, they are led to rediscover the creative, interactive, and fun aspects of the learning process. In this way, the project is expected to demonstrate how the cultural sector is a dynamic space for learning and exchanging knowledge.

1.5 How?

The training model proposed by the *CrowdSchool* Project consisted of the following steps:

- Each school was paired to a cultural partner
- Teachers selected some topics, according to their student's interests, class curriculum, and mission of their school, and passed the selected topics to the cultural partner they were paired to
- Cultural partners selected the digital images and created digital collections based on digital
 cultural heritage repositories (such as Europeana), according to the topics and interests
 suggested by teachers. As far as the secondary schools involved, the process of selecting the
 images was done by the cultural partners and teachers/students together, being secondary
 school students sufficiently digitally skilled (this task was on the contrary not suitable for
 primary school children)
- Jointly, the teams of teachers/cultural partners worked together identifying the terminology to be used for describing each collection (e.g. terminology for food, for animals, sports, architecture, etc.)

- Cultural partners worked to set up the Thesauruses needed for each collection. Thesauruses were based on Wikidata (see below for more details on this phase)
- Thesauruses were translated into the languages of the project partners
- Collections and Thesauri were uploaded onto the CrowdHeritage platform, set up by NTUA
- Students started the annotation campaigns, enriching the collections using the fields available in the CrowdHeritage platform (tagging, geotagging, and free-text fields)
- Annotations done by primary school students were revised by students of the other primary school involved in the Project (École Élémentaire Polangis students revised annotations made by Moderato Montessori Barcelona students and vice versa). Annotations done by high school students were revised by students of the other high school involved in the Project (Liceo Artistico Arcangeli students revised annotations made by Zespół Szkół Drogowo-Geodezyjnych i Licealnych (ZSDGiL) and vice versa). This process encouraged the development of critical thinking capacity in the revisers' group
- All process involving students were organised according to a gamification scheme
- Finally, to guarantee the sustainability of the system and pave the way to further annotation campaigns, the students became the mentors of their younger colleagues of the following school year, supporting them in the annotation and validation process on a different educational theme

1.6 Building up Thesauruses based on Wikidata

To enable students to annotate the images, a thesaurus had to be created for each campaign. In Library and Information Science (LIS), a **Thesaurus is a kind of controlled vocabulary**.

The cultural and technical partners provided support to the teachers to construct Thesauruses, which the students used to complete the 'tag' field of images of the various campaigns. A dedicated Thesaurus was built for each campaign, so that each campaign had a dedicated controlled vocabulary (e.g., a specific Thesaurus for the Olympic games and sports, for animals, for food, for the history of costume, for architecture, for Gaudi, etc.). The Thesauruses are all based on Wikidata because this tool offers the possibility of word lists being immediately available in many languages. The construction of the Thesauruses was done in this way:

- First the images of each campaign were analysed to identify which terms the students would need to describe the images
- The terms identified were entered into an excel file, and organised into hierarchies and groups
- It was then checked whether the words identified were present in Wikidata
- If a word was already present in Wikidata, it was verified that the description was complete
 and present in all partner languages. When necessary, descriptions were completed and
 translated into the missing languages
- If words were not present in Wilkdata, they were inserted and then translated into the various partner languages
- The Wikidata link of each word were inserted into the excel files
- Excel files containing the various Thesauruses were imported into the CrowdHeritage platform and associated with the relevant campaign

1.7 Results

The key outcomes obtained by the *CrowdSchool* Project are:

• Training teachers to use the CrowdSchool tools

- Customizing training materials to the purposes of targeted educational communities, using digital culture heritage to respond to their specific training objectives
- Acquiring Key Competences, through a creative and critical thinking approach, such as:
 - Learn how to read an image
 - Support students in expressing themselves orally and in writing to describe, explain and argue
 - o Enrich the lexicon and learn know how to use it appropriately
 - Acquire the ability to cooperate
 - o Acquire the ability to participate in a project
 - Develop the ability to use digital technologies to conduct research or produce content independently
 - Develop the ability to use digital technologies to carry out research or produce content independently (writing using a keyboard)
 - Promoting co-creation and collaboration of teachers/children with cultural heritage organisations
 - Increasing awareness of the European teachers' community on the relevance of creative and critical thinking capacity, using an interdisciplinary approach combining science and humanities

1.8 Specific benefits for 1st grade students

First graders have achieved remarkable learning outcomes because of this Project. In fact, the Project taught children how to cooperate (a fundamental skill that needs to be learned as early as possible in life). Teachers in the two elementary schools involved in the Project had the children work in pairs, asking them to discuss the pictures they saw, exchange ideas, explain why they agreed or disagreed with the other child's ideas, etc. Teachers also changed pairs so that children could experience group work with more children and compare different ways of reasoning.

1.9 Specific benefits for students with learning disabilities and attention deficit disorder

The Project proved very effective for students with learning disabilities and attention deficit disorder, who usually find it very difficult to deal with the use of language, especially written language, and traditional teaching tools.

Teachers verified that during the various stages of the campaign annotation process, students with learning disabilities and attention deficit disorder showed extraordinary interest, attention, and engagement.

The teachers believe that the increased interest and engagement and the excellent results and progress in language demonstrated by these students is because the *CrowdHeritage* digital platform has lowered the level of performance anxiety that these students normally have toward written language. In addition, the fact that images in the *CrowdHeritage* digital platform can be annotated through 'tags' made these students feel comfortable and at the same level as their classmates, without the fear of falling behind.

1.10 Discover the 12 CrowdSchool campaigns!

Partner schools from France, Italy, Spain, and Poland have worked to achieve the project's main goal: enhance the learning experience of students while promoting European cultural heritage digital repositories.

Each partner school, working with its twinned cultural organization, selected several images, grouped in thematic **campaigns**. According to each school's needs, campaigns have been divided into sub-groups called '**collections'**. The selected images were used to reach various educational goals, according to teachers' needs. The campaigns themselves functioned as pilot activities, whose final findings and materials have been disseminated to the targeted communities and stakeholders.

! Please note that these are internal campaigns: access to them and annotation is restricted to the Project's partners only

Campaigns selected by primary schools:

CITIES AND LANDSCAPES

School partner: École Élémentaire Polangis (France)
Cultural partner: Michael Culture Association (Belgium)

Description: This campaign presents cities and landscapes including geography, buildings, history,

and art history.

OLYMPIC SPIRIT

School partner: École Élémentaire Polangis (France)

Cultural partner: Michael Culture Association (Belgium)

Description: This campaign presents the Olympism including the Olympic cities, Olympic sports and

History.

ENDANGERED SPECIES

School partner: Moderato Montessori Barcelona (Spain)

Cultural partner: Dédale (France)

Description: This campaign features images of endangered animals and species that are very likely

to become extinct soon.

FOOD

School partner: Moderato Montessori Barcelona (Spain)

Cultural partner: Dédale (France)

Description: This campaign features various types of foods, prepared dishes, and food in art.

GAUDI

School partner: Moderato Montessori Barcelona (Spain)

Cultural partner: Dédale (France)

Description: This campaign features images of Gaudi's work, such as monuments, furniture and

other designs created by Gaudi.

MUSICAL INSTRUMENTS

School partner: Moderato Montessori Barcelona (Spain)

Cultural partner: Dédale (France)

Description: This campaign features music instruments, including string instruments, wind

instruments and brass instruments.

Campaigns selected by secondary schools:

ARTS AND FOOD IN THE CENTURIES

School partner: Liceo Artistico Arcangeli (Italy)

Cultural partner: STePS (Italy)

Description: Did you know that food has always been present in art as an iconographic element, whether in religious or secular subjects? The images collected here tell the story of the relationship between man and food, of how food has been used by men not only for nourishment but also to express and consolidate their bond with other men and with divinity. The images in these campaigns also describe how food has been prepared, served, consumed and traded over the centuries. They also tell the story of the cultivation and production of raw materials.

CLOTHING AND GARMENTS IN THE ARTS

School partner: Liceo Artistico Arcangeli (Italy)

Cultural partner: STePS (Italy)

Description: The collections in this campaign illustrate the evolution of fashion through clothes and

ornaments represented in the works of art.

ARCHITECTURE

School partner: Zespół Szkół Drogowo-Geodezyjnych i Licealnych (Poland)

Cultural partner: ICIMSS (Poland)

Description: This campaign includes different architectural styles: Romanesque, Gothic, Secession, Modernism. Buildings intended for worship, private buildings and buildings for public use are shown. The collection also includes many architectural details of these styles.

LANDSCAPES AND GARDENS

School partner: Zespół Szkół Drogowo-Geodezyjnych i Licealnych (Poland)

Cultural partner: ICIMSS (Poland)

Description: This campaign features landscapes and gardens ranging from mythical gardens such as Paradise, to ancient gardens as the gardens of Babylon, to present day gardens. The campaign features different types of gardens and plants.

UKRAINIAN TOWELS

School partner: Zespół Szkół Drogowo-Geodezyjnych i Licealnych (Poland)

Cultural partner: ICIMSS (Poland)

Description: The collection in this campaign feature cross-stitched Ukrainian towels that continue to have symbolic meaning at different stages of life, from birth to death.

FOLK COSTUMES

School partner: Zespół Szkół Drogowo-Geodezyjnych i Licealnych (Poland)

Cultural partner: ICIMSS (Poland)

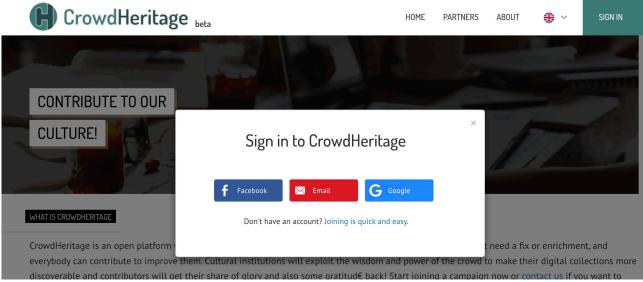
Description: The collection in this campaign includes the folk costumes of several selected countries.

Folk costumes show the cultural richness and variety of costumes in individual regions.

2. Navigating the CrowdHeritage Website

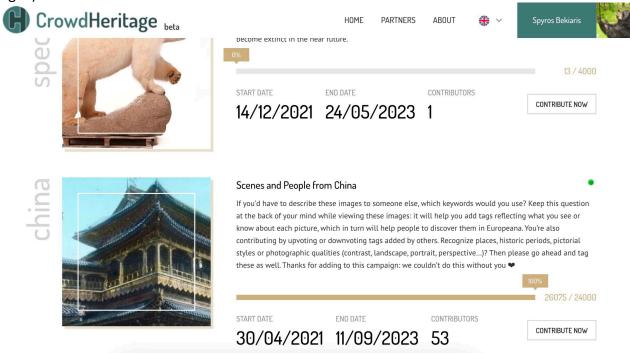
2.1 Sign in / Sign up

Visit https://crowdheritage.eu/ and click on the Sign in button on the top right. A pop-up will appear asking for your preferred sign in method or giving you the option to create an account if you don't already have an account. You can browse thought the Campaigns and Collections without logging in, but you will not be able to contribute (Fig. 1).



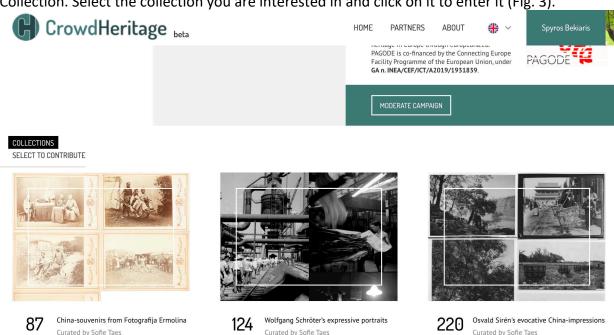
2.2 Choosing a Campaign

Once you have entered your credentials, you will now be able to see your username on the top right. Scroll down through the Campaign list on the main page and enter any Campaign you would like to contribute to. In this example, we will select the *Scenes and People from China* Campaign (Fig. 2).



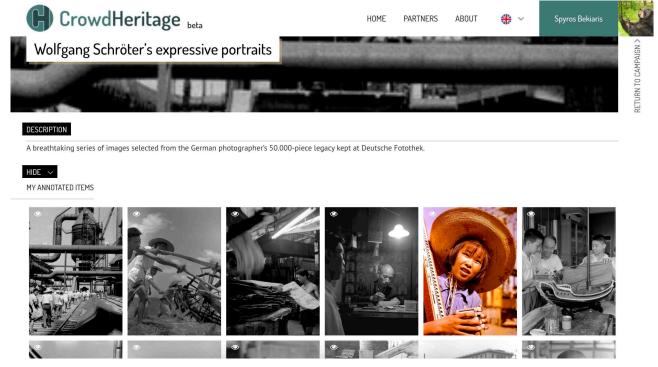
2.3 Entering a Collection

Each Campaign consists of one or more Collections. You can view those Collections under the Campaign information, by scrolling down further. Each listed Collection has a title, the number of items it contains, the name of its curator and a thumbnail made of some sample images form that Collection. Select the collection you are interested in and click on it to enter it (Fig. 3).

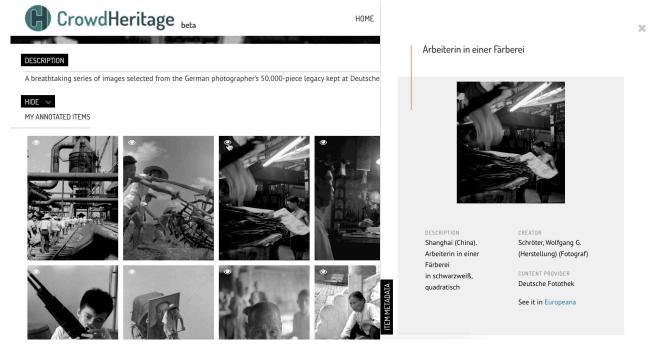


2.4 Selecting an Item

Within the Collection, you will be presented with a description of that Collection and the Items it contains. You also have the option to view or hide the Items you have already annotated, by selecting the *View* or *Hide* option on the selector (Fig. 4)



By hovering on the thumbnail of an Item, you can either click on it to enter the Item or click on the *eye* icon on the top left of each image to preview it (Fig. 5):



If you want to create annotations for an Item, click on it to access its page.

2.5 Annotating an Item

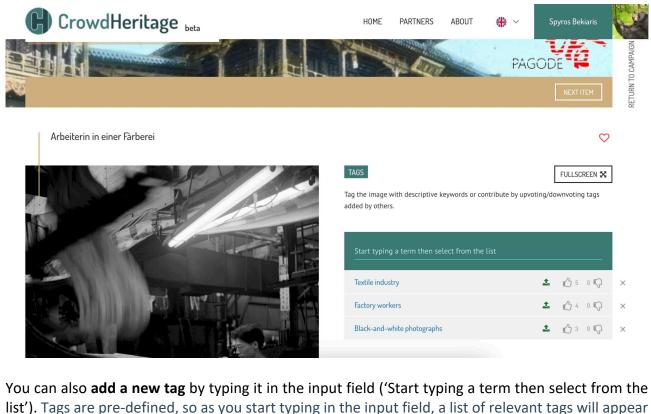
There are three types of annotation you can add to an Item:

- 1. Tags
- 2. Comments
- 3. Geotags

1. Tags

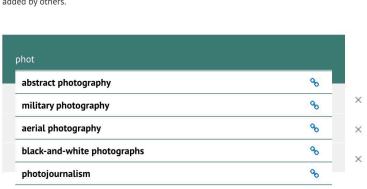
The first type of annotation you find on the right sidebar are **tags**. Tags are predefined categories that describe an Item.

If a tag has already been added by another user, you can either *Upvote*, *Downvote* or *Remove* the existing tag by clicking the 'thumbs-up', 'thumbs-down' or 'X' icon next to that tag, respectively (Fig. 6)



list'). Tags are pre-defined, so as you start typing in the input field, a list of relevant tags will appear in a drop-down list. The user will select the most appropriate one(s) within the list (Fig. 7).

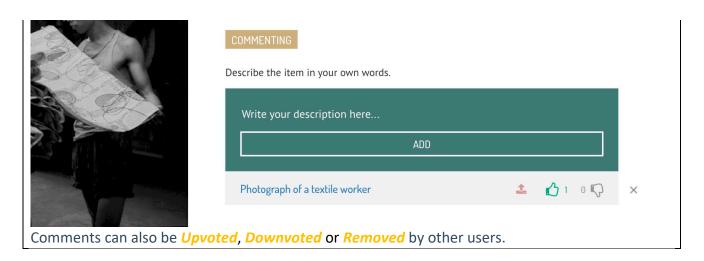




FULLSCREEN 🔀

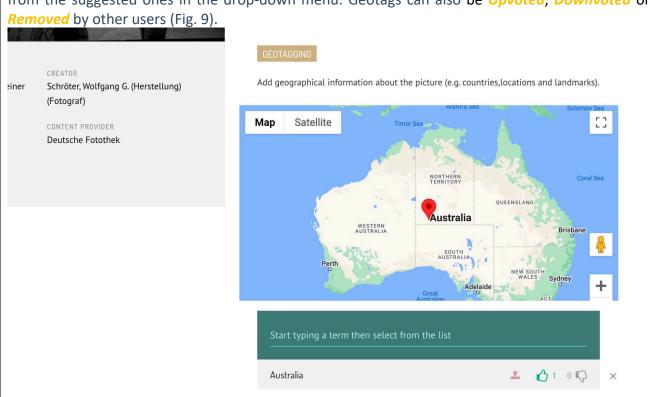
2. Comments

The second annotation type is a **comment**. Comments are text annotations, just like tags, with the essential difference that they are a free-text strings instead of predefined strings. If a user feels that the information contained in the tags is not adequate, they can add a custom text that conveys the information they want to add as an annotation (Fig. 8).



3. Geotags

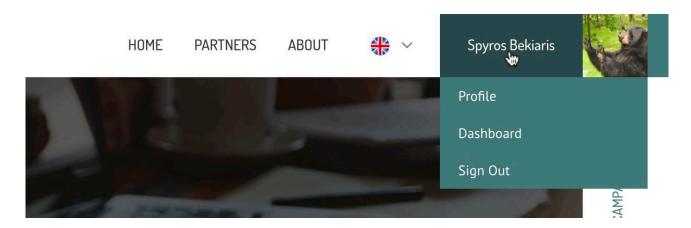
Lastly, **geotagging** is a special kind of tag that refers specifically to a location. The user will start typing the location name in the input field under the map, and then select the appropriate location from the suggested ones in the drop-down menu. Geotags can also be *Upvoted*, *Downvoted* or *Permoved* by other users (Fig. 9)



2.6 Campaign Organizers' tools

As a Campaign Organizer you have the additional capabilities to create and edit Campaigns, Collections, Vocabularies and Usergroups. As well as access to Campaign statistics and other moderating tools. We will first go through the Dashboard and then take a look on the Moderating tools.

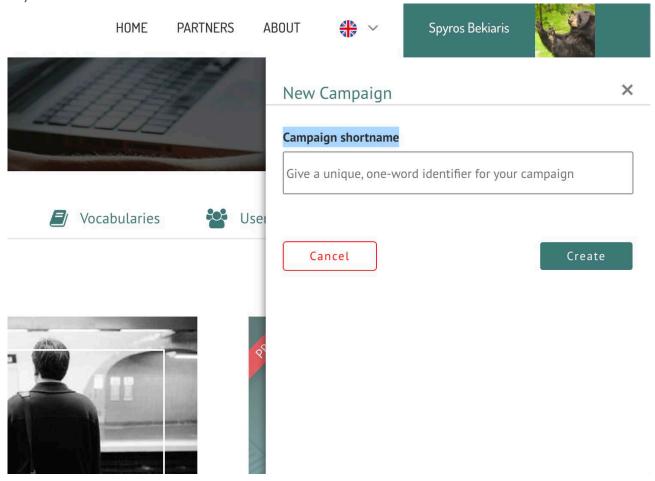
To access the dashboard, as a signed-in Campaign Organizer you will click on your username on the top right of the Navbar and then click on *Dashboard* (Fig. 10).



Within the Dashboard, a user can view all the Campaigns, Collections, Vocabularies and Usergroups - each under the respective tab - as well as create new ones or edit existing ones.

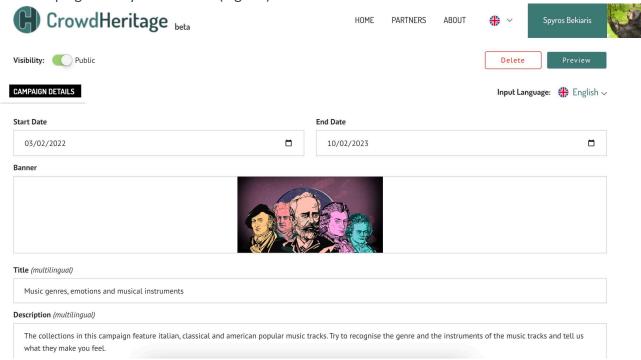
2.7 Create/Edit Campaign

To create a new Campaign, click on the + New Campaign button on the top right of the Campaigns tab (as seen on the above screenshot). A sidebar will appear on the right, asking to choose the Campaign's shortname. If the shortname already exist, you will be notified to select another (Fig. 11).



Once you click on the *Create* button, your new Campaign will appear on the Campaigns list and you can click on it to edit any or all of the details. There is a long list of input fields like: Visibility, Start/End

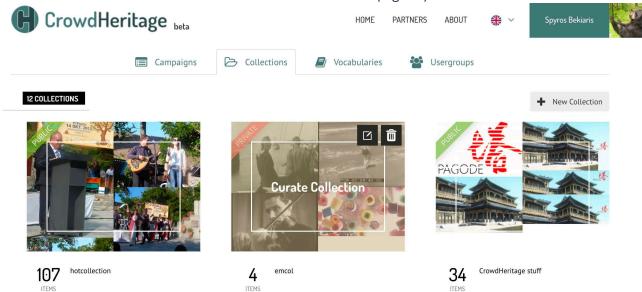
Dates, Input Language, Banner, Description and so on. There are buttons to *Preview* and/or *Save* the Campaign after you are done (Fig. 12).



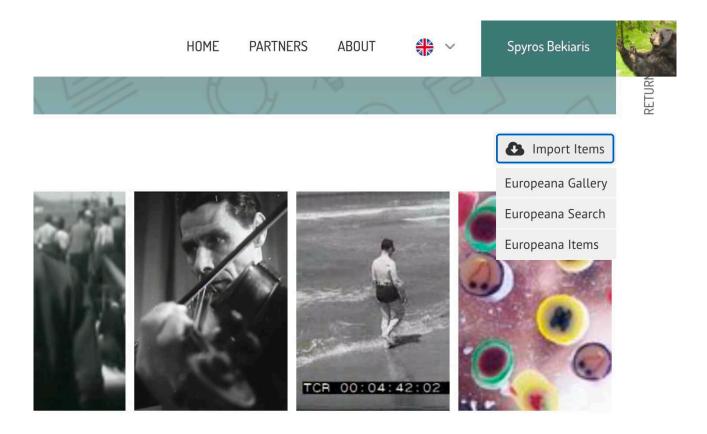
The input fields marked as (*multilingual*) can be edited in multiple languages by selecting their appropriate language on the *Input Language* dropdown menu on top. This way, whenever a user views a Campaign, it will appear in their own language if the Campaign Owner has added the relevant text in the user's language.

2.8 Create/Edit Collection

Creating a Collection is a similar process as creating a Campaign. The user has to navigate on the **Collections** tab and click on the **+ New Collection** button. (Fig. 13)



Then fill the requested information, and select the newly created Collection to import Items in. (Fig. 14)



There are three options to import items when clicking the *Import Items* button.

- 1. Europeana Gallery Import a whole gallery by entering the Europeana Gallery ID for that gallery
- 2. Europeana Search Import a selected number of Items that contain a desired Search Term.
- 3. Europeana Items Import specific Europeana Items by giving a list of those Items' URLs.

2.9 Create/Edit Vocabulary

Creating a Vocabulary is a similar process. The user must navigate on the *Vocabulary* tab and click on the *+ New Vocabulary* button. Name the vocabulary and click on the edit icon in order to add terms to it. (Fig. 15)



The terms can be either added one-by-one or batch imported as a CSV. They can also be Downloaded as a CSV. You can view all options by clicking *Manage Terms*. (Fig. 16)

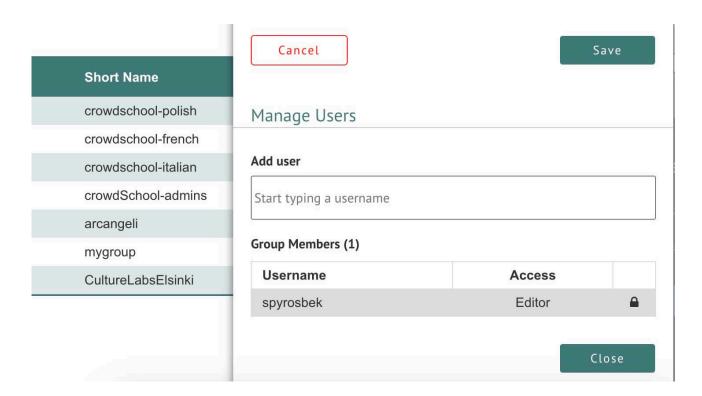


2.10 Create/Edit Usergroup

Lastly, we have Usergroups which follow a similar process. The user has to navigate on the *Usergroup* tab and click on the *+ New Usergroup* button to give the usergroup a name and description. (Fig. 17)

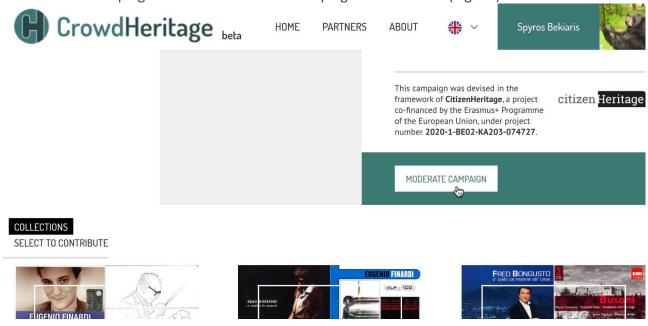


Once the group is created, click on the edit icon and add users in that group under the *Manage Users* section on the right sidebar. (Fig. 18)

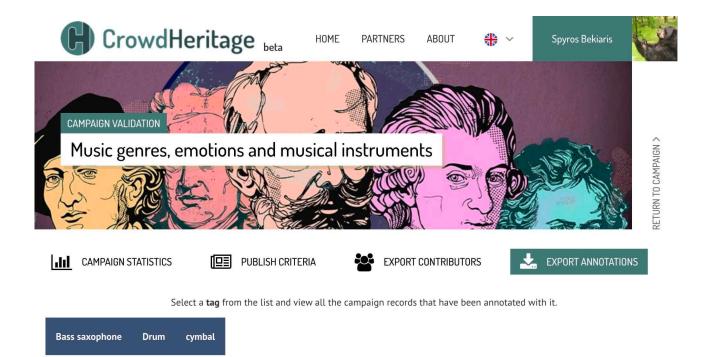


2.11 Moderate Campaign

When a Campaign Owner visits a Campaign page, a button named *Moderate Campaign* appears between the Campaign information and the Campaign's Collections. (Fig. 19)



This button navigates to a Campaign Validation page which provides some tools that only a Campaign Owner has access to. (Fig. 20)

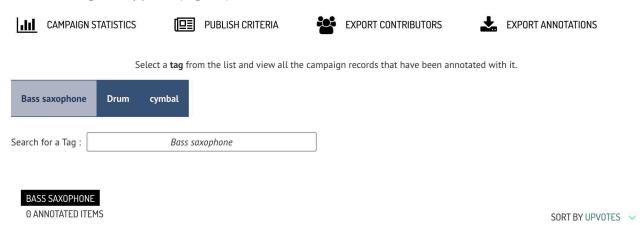


2.12 View annotations by TAG

Start typing a term then select from the list

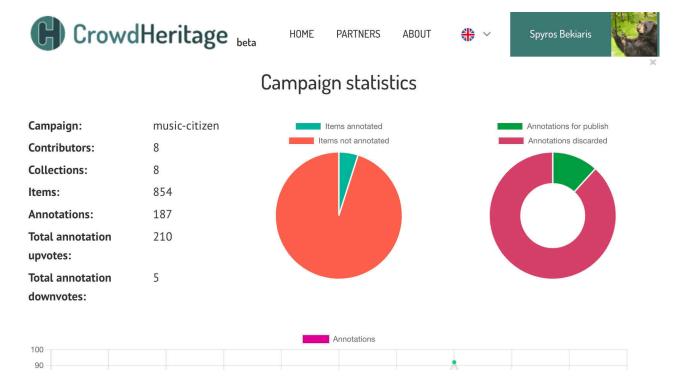
Search for a Tag:

By typing or selecting one of the available tags, like "Bass saxophone", a list of Items annotated with the chosen tag will appear. (Fig. 21)



2.13 Campaign Statistics

By clicking the *Campaign Statistics* button, the Campaign Owner can view some statistics about that specific Campaign, like total items, total annotations, annotation upvotes etc. (Fig. 22)



2.14 Publish Criteria

Annotation publish criteria

Annotation publish criteria

Validation start date:

cym Minimum annotation score:

Allow annotations with downvotes:

Cancel Submit

2.15 Export Contributors and Annotations

The final two buttons give the Campaign Owner the option to export the contributing users and the annotations of the Campaign, as a **JSON file**.

3. Lessons Learnt, Guidelines, and Suggestions for Teachers

The *CrowdSchool* Project has implemented the proposed methodology both in primary schools and in secondary schools. **Students' experience with the** *CrowdSchool* **Project and** *CrowdHeritage* **platform has been different, according to their age.** Indeed, the students interacted and used the digital tools of the platform based on their age-appropriate skills. Consequently, the teachers have prepared appropriate lessons and learning objectives according to the age groups.

Selective attention vs divided attention: Some authors have divided attention into five components (Sohlberg & Mateer 1987, 2001, 2010)¹: focused attention (refers to our ability to focus attention on a stimulus), sustained attention (the ability to attend to a stimulus or activity over a long period of time), selective attention (the ability to attend to a specific stimulus or activity in the presence of other distracting stimuli), alternating attention (the ability to change focus attention between two or more stimuli), and divided attention (the ability to attend different stimuli or attention at the same time).

Selective attention consists in the ability to select and, precisely, pay attention to a single stimulus present in one's environment. This process can therefore be considered as a 'filter' capable of selecting the incoming information, deciding which ones should be processed, because they are relevant for a task, and which, on the contrary, ignored because they are irrelevant. Selective attention allows the implementation of an effective perceptual selection of information (Hanania & Smith, 2010; Plude et al., 1994). Humans develop selective attention after 7 years of age, i.e. following the maturation of the frontal lobes.

On the contrary, children until the age of 6 have a markedly **distributed and divided attention** mechanism, even when asked to focus on only one very specific aspect of the environment. The consequence of this 'developmental progression' is that **adults are good at selecting and remembering information** they were told to pay attention to, ignoring everything else. While **4-6-year-olds have the tendency to select everything that is shown to them** (that is, to notice everything, which is equivalent to not selecting anything), regardless of the degree of relevance of the stimulus for the purposes of the task.

This difference between distributed attention and selective attention was very evident in the tasks entrusted to primary school children and in those assigned to the secondary school students involved in the Project. The observations collected by the teachers during the Project regarding the two different types of attention in children and adolescents have led to very important and interesting conclusions and suggestions for teachers who in the future will want to adopt the methodologies proposed by the *CrowdSchool* Project.

Attention span: The Project proved that **attention span** got highly increased in primary school students respect to standards. It is renowned that in a child, attention lasts less than in an adult. For example, a 6–7-year-old becomes distracted after about 15 minutes, while a 13–15-year-old can pay

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¹ Sohlberg MacKay M., Mateer Catherine A., 1987, 2001, 2010

attention continuously for about 30-40 minutes and a 16+ year old for about 32-50+ minutes². Nevertheless, the Project proved that primary school students and even primary school students with learning disabilities or attention deficit disorders, were able to interact with the digital platform much longer than during any other traditional lesson.

Based on the feedback received by the different age groups, the present document proposes common guidelines and suggestions for all ages and further guidelines and recommendations specifically for each age group. Next to each recommendation and suggestion you will find an icon indicating if these are:

- suitable for all ages
- for secondary school students only
- for primary school students only.

² https://www.cnld.org/how-long-should-a-childs-attention-span-be/#:~:text=5%2D6%20years%20old%3A%2012,years%20old%3A%2020%2D30%20minutes

LESSONS LEARNT, GUIDELINES AND SUGGESTIONS FOR TEACHERS:

1. What <u>aspects</u> of the *CrowdSchool* Project resulted beneficial for the students?

Primary + Secondary schools

- Students felt more self-confident thanks to the process of commenting the images, to the process of revising other students' annotations, and thanks to participating in an international project
- Students felt being part of an international community, even primary school children
- Students felt proud to participate in an international project
- Students enjoyed and felt enthusiastic about virtually meeting students of other European countries
- Students enjoyed competition
- Students enjoyed and felt enthusiastic about revising each other's annotations
- The Project's platform is suitable for all ages: primary school students, secondary school students and even adult students, that shall use the platform while continuing education at university
- Students experience **a new and innovative methodology**, different from what a common curriculum offers
- Collections are universal and can be used in different ways and subjects

Secondary schools

 Secondary school students got particularly engaged when asked to revise tagging made by Artificial Intelligence

2. What are the <u>skills</u> and <u>competences</u> improved by the students thanks to the *CrowdSchool* Project?

Primary + Secondary schools

- The Project supports the **4Cs of the 21**st **century**: Critical thinking and Creative Thinking, Cooperation, Communication³.
- Students **learn to work in groups** with international students, thus strengthening the 4Cs outside their class and outside their country
- Working in groups with foreign students rises young people awareness of each other cultural characteristics, and makes young people respectful of each other traditions and culture
- The Project supports and rises students' cultural awareness
- The Project helps students broadening their horizons and becoming more open and curious
 Primary schools
- Students learn to use **new digital features on computers:** nowadays, children get in touch with technology at a very early age by using mobile phones and tablets, while at a very early age they

³ In 2002 the *Partnership for 21stCentury Skills* (www.battelleforkids.org/networks/p21) was created for learners to acquire knowledge and skills needed to thrive in a world where change is constant and learning never stops. P21's mission is to serve as a catalyst for 21stcentury learning by building collaborative partnerships among education, business, communities, and government leaders. This led to the development of the *Framework for 21st Century Teaching and Learning*. The 4Cs are included in the *Framework* as part of Learning and Innovation skills and competences children need thrive in work and life. The 4Cs are: Critical thinking (finding solutions to problems); Creativity (thinking outside the box); Collaboration (working with other); Communication (conveying ideas).

are less used to computers. The Project has supported young children in getting to know a more complex device such as a computer and its software

3. Did the Project resulted beneficial also for students with disabilities and for students with attention deficit disorders?

Primary + Secondary schools

- The CrowdHeritage platform resulted very beneficial for students with learning disabilities and attention deficit disorder, who usually find it very difficult to deal with the use of language, especially written language, and traditional teaching tools (see paragraph n. 1.9)
- The Platform increases students' attention: students tend to pay a lot more attention at the images provided through the Platform and thanks to the task of tagging assigned to them

4. What are the specific benefits, goals, and objectives of the process of tagging?

Primary + Secondary schools

- Tagging is a funny way for students to learn by playing (gamification)
- Tagging is an interesting, involving and engaging challenge
- Students find the tagging process involving and creative
- Tagging motivates students to learn and to deepen their knowledges of a specific subject
- Students are proud when their tagging are upvoted (thumbs-up) by their peers
- By tagging and by observing the images, students learn **new words and terminologies** both in their **mother tongue** or in **foreign languages** they study
- Students find the geo-tagging function a creative feature
- Teachers find the geo-tagging function helpful to support (also) history and geography lessons
- In the CrowdSchool Project, collections are made available in all the partners' languages: Spanish, French Italian, Polish, English, and it's easy to switch from a language to another. Students found useful and enjoyable switching from a language to another and learning new words in another language

5. What to keep in mind when setting a campaign?

Primary + Secondary schools

- Before starting the tagging campaign/s, offer your students a lesson on the selected topic/s. It can be a workshop, a visit to a museum, etc.
- Tagging may need pre-teaching certain vocabulary (basic or advanced, depending on students' age)
- Take time to create your own Thesaurus for your campaign/s, according to the teaching objectives you want to reach and to your students' age. This implies having a clear idea of your teaching objectives well in advance
- Check that the tool is working properly before using it. The minutes spent fixing technical problems are minutes when you easily lose your class
- Have several formats for using the Project's platform: in groups to encourage discussion, individually but under supervision to check knowledge, or in complete autonomy
- Encourage students to go beyond the vocabulary listed in the Thesaurus by using the free-text field to comment and describe freely, without constraints of pre-established terminology
- Do not choose the campaigns too quickly and simply on the basis of the theme of interest: spend time in choosing your campaigns according to your class curriculum and medium/long term objectives

Test the Platform and learn how to use it before having your students using it

Primary schools

- Carefully select the images that best suit your educational purposes
- The topic of the collection/s shall suit your students' interests
- As young students have a **diffused attention**, they will get easily distracted by the various elements of the images they will look at. To **make their attention more focused**, you shall:
 - Take time to choose the campaigns suitable for your students' age
 - Take time to **choose all** the images within each campaign to avoid making students uncomfortable in front of complex images
 - Before setting the campaign, we recommend organizing a **pilot campaign** with just a few images, to understand how your students react to the images you have selected and how their analysis skills work according to their age
 - Setting a pilot campaign is also useful for the teacher to understand if the images selected correspond to their **teaching needs**
- Choose images that are easy to read and understand. For example, if an image represents a
 poster/an advert, it will contain images and text too, and often these elements will be displayed
 to suit with specific communication purposes. All such elements will catch your students'
 attention and imagination and will not facilitate your young students' attention on the elements
 you want them to focus on
- Be aware, because a lot of images can result complex under this point of view
- Black and white pictures might result boring for young students, or less engaging, or more
 difficult to understand and to observe. Reduce the number of B/W images and offer special
 support to students that target B/W pictures
- Plan one or two sessions for the youngest students to discover the platform (if possible, with student tutors)
- Take time to create your own Thesaurus for your campaign/s, according to the teaching objectives you want to reach and to your students' age. This implies having a clear idea of your teaching objectives well in advance
- **Prepare the terminology well in advance** so that the necessary vocabulary is available to the pupils. This will avoid a lot of inconvenience and time lost during sessions.
- Give each pupil an individual access code to the platform: thus, they can access the platform
 independently outside school hours if they wish to, and continue the annotation activities
 (many will be eager to show their new skills to their parents, siblings and relatives)

Secondary schools

- Working with secondary school students means that you might want to involve your students
 in the search and selection of the images to be included in each campaign (under your
 supervision)
- Working with secondary school students means that you might want to involve your students
 in the process of setting up the Thesaurus for each campaign (under your supervision)
- Having the students selecting the images and setting up the Thesaurus for each campaign by themselves, means involving them in a deeper and more active process of learning: being in charge of this important task will make them feel more responsible and more involved; they will also observe the images under a more 'active' and profound glance.

• Furthermore, setting up their Thesaurus based on Wikidata will support their logical and analytical skills (Wikidata requires certain specific hierarchical and logical schemes)

6. What do the stakeholders say about the CrowdSchool Project?

- Students' parents felt the Project being very useful in supporting teaching objectives
- Students' parents felt the Project methodology very innovative
- Students' parents felt enthusiastic their sons and daughters participating in an international project
- During dissemination events, teachers at other schools and other schools' directors said to be very interested in setting up campaigns using the Platform
- The directors of the schools involved in the Project said to be proud of their students' results and proud of the school participating in an international project

7. Why the Project promotes dialogue and inclusiveness?

- Because the CrowdHeritage platform overcomes language barriers: the process of tagging is sustained by Thesauruses based on Wikidata: this implies that users see the tagging in their own mother tongue. Consequently, it is easy for students to get in contact with each other and to revise each other's work even if they belong to different countries and even if they don't speak any common language
- Because through cultural heritage repositories (Europeana in particular) students are able to approach and study many topics, thanks to the millions of items included in such repositories
- Because the CrowdHeritage platform supports interactions with diverse groups
- Because students are encouraged in practicing active listening
- Because it supports the development of **cultural intelligence**, i.e., the ability to interpret the stranger's behaviours the way the stranger's compatriots would (Muzychenko 2008)

8. Final suggestions for teachers

Primary + Secondary schools

- Organise online meetings between the students of the classes that are twinned in the project: the students are curious to get to know their 'foreign' classmates and will be delighted with this experience. The occasion could also be interesting for exchanging knowledge about local customs, traditions
- Organise online meetings between teachers of twinned classes, to exchange ideas about the Project, the campaigns, the difficulties you encounter, the possibilities offered by the Project, to create together, etc.