Cultapp

Co-funded by the Erasmus+ Programme of the European Union

AUGMENTED LEARNING PROJECT WORK -
making transnational school projects on Europe's Cultural Heritage

- August 2021 -

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CultApp - Experiencing augmented reality on cultural heritage applications
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PARTNERS OF THE AUGMENTED LEARNING PROJECT WORK

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making transnational school projects on Europe's Cultural Heritage

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INTRODUCTION

ABOUT THE CULTAPP PROJECT

Cultural heritage is part of the personal identity of the European citizens. The study of European cultural heritage shows deep historical connections between people, states, and their diverse, colourful, and unique cultures.

Do you want to know more about Cultural Heritage in a simple and intuitive way? CultApp project makes it possible through keeping valued common historical and cultural stories in your pocket!

Experiencing Augmented Reality on Cultural Heritage Applications in iVET, or in short CultApp, is a project funded by the Erasmus+ programme of the European Union.
CultApp contributes to raising awareness of Europe's Cultural Heritage, focusing on young learners and the need to present our common history in more attractive and exciting way. CultApp aims to inspire young people and discover European Cultural Heritage by using Augmented Reality for a better cultural experience.

The projects innovations include:

- Fostering the 21st century skills by learners, such as communication, critical thinking, problem-solving, transnational collaboration, curiosity.
- Teacher support in applying new practices to involve learners in artistic and cultural activities using innovative digital educational tools (AR applications) for an interactive collaborative learning.
- Promoting Europe's values and citizenship in a natural and joyful way, through the common Europe's Cultural Heritage.

CULTAPP PARTNERSHIP

CultApp partnership is composed of seven organizations from Bulgaria, Germany, Greece, Italy, the Netherlands, and Poland. Partners have different profiles, but they are all committed to the idea of the strengthening of Europe's values through promoting Europe's Cultural Heritage.

Fachhochschule des Mittelstands FHM (Germany) is a private state-approved University of Applied Sciences. Founded in 2000 by small and medium-sized enterprises, the FHM is nowadays one of the most successful private universities in Germany with a strong focus on the needs of German SMEs. Virtual and Augmented Reality is one of the key areas of their research and development projects.

EFFEBI association (Italy) is a non-profit organization set up in 1978 in Rome. Since its foundation, EFFEBI has been a reference point for people involved in Human Recourse management and development of organizational models, mainly for the banking and financial sector. In addition, EFFEBI is actively involved in developing and managing European projects.

CrystalClearSoft Education CCS (Greece) is an international software development company actively researching on innovative uses of state of play technology in digital publishing, education, training, and knowledge dissemination. Offering a turn-key solution, from conceptualization and instructional design to testing and deployment, CCS has developed applications used in thousands of classrooms all over the world.

Istituto Tecnico per il Turismo Marco Polo (Italy) is a public upper secondary school based in Florence, which addresses a technical education for Tourism. The school has invested in the adoption of new technologies and related pedagogical approaches. School lecturers are involved in the development of innovative educational activities based on a stimulating augmented and virtual reality.

National Association of Resource Teachers NART (Bulgaria) is a national NGO umbrella for professionals working for full and quality integration, inclusion, and education of children with different abilities and needs in mainstream education. Our goal is to promote continuous improvement of the quality of education and social services in support of integration and inclusion of all children in Bulgaria.

Agora Niekée (the Netherlands) is not a traditional school but a square where teachers and children learn and work together. Every child wants to grow and learn.

AUGMENTED LEARNING PROJECT WORK –
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Teacher's task is to contribute to the growth and development of every child. Together they work on the square and invite experts and expertise in the world around to help them and unleash all the knowledge and expertise which is available.

PAIZ Konsulting (Poland) has been providing training and consulting services in leadership, sales, and interpersonal skills to Polish and European organizations since 1997. Project management and research experience include partnership within various EU-funded projects. PAIZ' experience in delivering ICT-based educational solutions culminated in leading an Erasmus+ partnership to develop an online-service for supporting learning implementation.

CULTAPP OUTPUTS:

Output 1: Augmented Reality Meets Cultural Heritage – Compendium of practices and applications. The Compendium showcases the applications of Augmented Reality on art and cultural objects in different European countries and provides several inspirations for adopting these practices. The Compendium is freely downloadable under http://cultapp.eu/compendium-of-augmented-reality-technologies/.

Output 2: Online Teachers' Training Programme: Augmented Reality for Cultural Heritage Education (AR4CHE). The programme addresses Art, History or Media Design teachers who want to try innovative AR tools and technologies to inspire their learners for Cultural Heritage. AR4CHE helps teachers understand the pedagogical value of AR technologies, use AR for teaching Art, Culture or Media Design, and empower them to design and implement simple AR-based projects with their learners. The AR4CHE course is freely accessible under www.ar-cultapp.eu.

Output 3: Augmented Learning Project Work: This is a real story of adventure, research, and inquiry to discover Cultural Heritage through Augmented Reality. During this project, selected teachers and learners from CultApp countries Italy, Germany, and the Netherlands virtually worked together on the creation of fictive cities and development of corresponding AR maps where they presented the past, the presence and a possible future of the selected cultural assets in the cities Florence, Bielefeld, and Roermond. Everyone is invited to explore the AR city maps and their creation stories by reading this publication as well as by following all the project steps via the Augmented Learning platform www.cultapp.erasmusplus.space!

ABOUT THE PUBLICATION:

With this publication, the CultApp partnership shows a new way of exploring Europe's Cultural Heritage through Augmented Learning project work in vocational schools and colleges. The publication describes the main idea, steps, and milestones of the AL project, which was carried out by real participants of the CultApp project - learners and teachers. The publication is enriched with various visual materials, which were created by the participants of the project. The visuals help understand how the project was implemented and what has been achieved after each stage.

The Publication intends to animate teachers and learners across Europe for the topic Cultural Heritage and to encourage the development of new competences and skills within vocational education and training institutions. Teaching staff is expected to receive inspirations for the creation of their own AR pedagogical projects and ideas towards their integration into classes. Learners can get inspired by the idea to explore cultural places in their home cities and regions as well as abroad in a collaborative, digital and funny way. Finally, everybody can benefit from the publication and explore real cultural assets in the fictive cities through AR!

We wish you a lot of fun when reading the publication!

Your CultApp team

AL PROJECT WORK: OVERVIEW

OBJECTIVES OF THE AL PROJECT:

Following the overall CultApp project design, Augmented Learning Project Work (we'll call it AL project for short) aimed at inspiring young learners from vocational colleges for Cultural Heritage through Augmented Reality. We had a vision of creating an AR scene, or simple AR application for a cultural asset to be jointly selected and augmented by young learners from different CultApp countries. In doing so, we strived to promote relevant transversal competences of young people, such as creativity, digital skills, aesthetic competence, virtual collaboration, intercultural competence, communication, English language skills, critical thinking, problem-solving skills. Of course, all the elements of the AL project had to be concretized yet. At the very beginning, we had a vision...

PARTICIPANTS AND ROLES:

The CultApp partnership was divided into 2 groups. The first group, consisting of partners FHM, Agora Niekée with the school BC Broekhin, and ITT MP, were direct project participants meaning that their teachers and learners directly performed the AL project actions. Partners from the 2nd group - Effebi, PAIZ, NART - formed a kind of backup office: they didn't directly participate in the AL project's activities but provided different support to the AL project team, such as conducting research activities at the inception stage, performing mid-term and final project evaluation, documenting AL project achievements.
Partner CCS was engaged in designing and developing an Augmented Learning (AL) Platform. This AL platform was supposed to be used as place for storing and documenting all the materials about the AL project. The AL Platform is now free to use for everyone: you just need to get registered there under www.cultapp.erasmusplus.space and follow all the developments of the AL project.
The most exciting thing was that one further German partner, Vocational College Senne (VCS Bielefeld), joined the AL project on a voluntary basis! VCS has been cooperating with FHM for a few years in the field of digital technologies. Thus, for VCS teachers and learners the AL project was a great opportunity to enhance their media literacy and digital skills, but also to learn about Cultural Heritage.
Teachers and learners from three countries were involved into the AL project as follows:

- Germany: 3 teachers from VCS, 1 teacher from the FHM, 20 learners from VCS;
- The Netherlands: 2 teachers and 9 learners from the school BC Broekhin;
- Italy: 3 teachers and 6 learners from ITT MP.

Teachers and learners from the 3 above-mentioned schools had different profiles, i.e. VCS focuses on Media Design and Production, ITT MP – Arts and Tourism, BC Broekhin – History. This combination ideally fitted the context of the AL project, which required interdisciplinary skills to create an AR application for a cultural asset!

At his stage, you might ask how we managed the communication and collaboration among so many international learners? We will explain our strategy in the next chapters! It is worth mentioning that CultApp key staff at FHM, AN, and ITT MP were also involved in the AL project as consultants, or supervisors. They monitored the project's timely implementation, took care of the good and safe communication, provided technical support (where needed), and were the main contact points in case of any problems.

EXPECTED RESULTS:

What did we finally specify as a final tangible output of the AL project? We must confess, we had a longer creative brainstorming with our partners, which finally resulted into the following definition: it will be an AR city map showing AR scenes about the selected cultural objects from three cities Florence, Roermond, and Bielefeld. Each object will be recognized by using a camera of a mobile device, mobile app and an AR marker. The AR scenes will represent not only the past of the cultural objects, but also their historical evolution and the vision of these objects in a context of a modern European city (based on Eurocities goals: https://eurocities.eu/goals/).

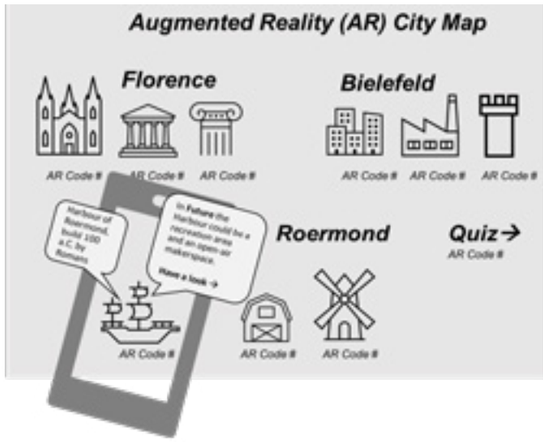

Fig. 1: Vision of the AL project (own image)

Thus, within each AR scene, users will find contents dealing with the cultural object in terms of:

- Architecture and aesthetics,
- Urban function and evolution,
- Future development opportunities.

Our learners had therefore to perform several creative and challenging tasks, such as:

- Conduct a desk research about Eurocities goals,
- View the examples of cities refunctionalisation (based on the desk research findings provided by partners NART, Effebi, PAIZ),
- Select cultural objects in their home cities;
- Create digital content for these cultural objects that explains their past, evolution and provide a vision of these objects in the context of a modern European city, (i.e. texts, sketches, images);
- Transfer the objects to the AR city map;
- Test the final AR city map;
- Present the final AR city map to local audience.

In addition, they had, of course, to closely work in international groups and communicate in English with their peers!

APPROACH USED FOR PERFORMING AL WORK:

First of all, we opted for the participatory approach: this means, young learners had to be involved in all stages of the AL project, starting from the selection of the cultural assets through production of augmentations to the rollout of the final output. Moreover, learners had to play pro-active role when developing and implementing all the AL project! Doing so, we intended to increase their ownership of the project. Finally, the selected approach had to promote by learners as many transversal competences as possible. Bearing this in mind, we actively used Design Thinking approach when designing and implementing the AL project.

WHAT IS DESIGN THINKING?

Design Thinking approach originated in architecture, design and art. It stands for an iterative process which seeks to understand users, challenge assumptions, redefine problems, and create innovative solutions to prototype and test. The method is basically applied when tackling problems that are ill-defined or unknown.
Nowadays this method is applied in many fields, also in education, since it perfectly fits the learner-centered approach. Design Thinking can enhance creativity, innovation, and collaboration of learners. It helps focus more intensively on learners' needs and therefore, get them inspired for any learning project.
Design Thinking includes 5 phases - Empathize, Define, Ideate, Prototype and Test.

TIMELINE:

As the AL project was the integral part of the overall CultApp project, we had to harmonize its timely implementation with the general project schedule. Thus, our learners and teachers got 2 calendar months (March and April 2021) for the project realization. However, due to the 2-week school holidays in between, the effective project work lasted for 6 weeks. To be clear: these 6 weeks were supposed to be spent on the direct project work. The time invested into the design and development of the project concept was not part of those 6 weeks.

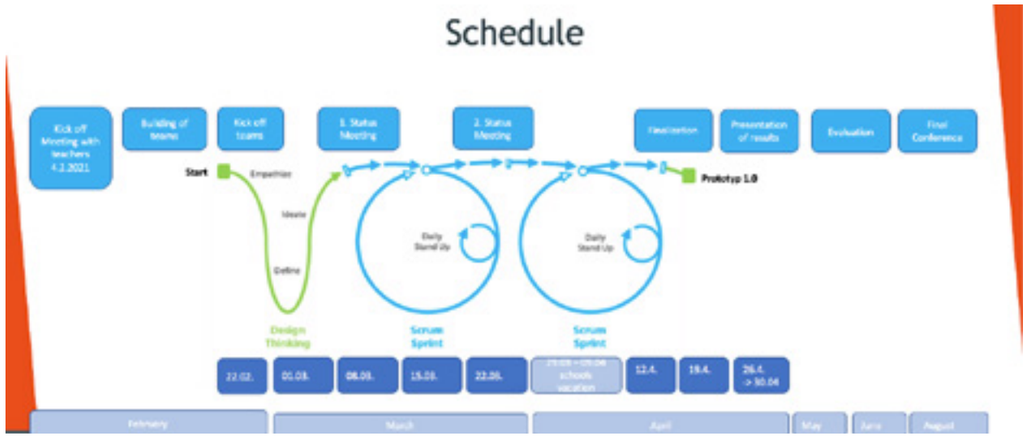

Fig. 2 : Timeline of the AL project (own image)

PREPARATION OF THE AL PROJECT

In this chapter, we will explain how we selected teachers and learners for the transnational AL project work, which communication channels were chosen, and how the project was launched.

SELECTION OF TEACHERS:

Under normal circumstances, teachers would be expected to design and implement such a project without CultApp members. But, since the AL project is a pilot, teachers and learners were, of course, supported and counselled by CultApp managers. Thus, prior to the elaboration of the AL project details, we selected teachers from ITT MP, AN, and VCS who had to coordinate the project at their schools and support learners when performing their tasks. When doing selection process, we considered following aspects:

- Available digital (and, in particular, AR) skills;
- Teaching experience;
- English language skills;
- Opportunity to integrate the AL project into ongoing school lessons;
- General enthusiasm and willingness to innovate their teaching.

TIP for teachers: when planning your own AL project, try to incorporate it into the subject/lesson you teach: this would bring many benefits to you from the organizational but also pedagogical point of view, such as efficient use of time and resources, more engagement of learners.

In addition, to help teachers properly participate in the AL project, we recommended them taking the open online course free course "Augmented Reality for Cultural Heritage Education" www.ar-cultapp.eu elaborated by the CultApp team. This open online course was designed to empower teachers to design and implement AR-based projects in their classes, and covered issues related to the value of Cultural Heritage in Europa, AR technology and its application, creation of simple AR scenes, and creation and realization of own small-scale AR projects.

KICK OFF MEETING WITH TEACHERS

After we had selected teachers for the AL project, we initiated a joint transnational online meeting. On February 4, 2021, teachers from 3 countries met for the first time to learn from each other and to discuss the project's implementation. It was very helpful to agree on the common vision of the AL project.

SELECTION OF LEARNERS

In the next step, appointed teachers collected and analyzed different data about potential learners from their schools to create a better understanding of their needs and their current situation. Having an overall project idea in mind, we had to ensure whether it would also fit learners' interests, their previous knowledge, available skills and competences, habits, learning styles. Teachers observed, i.e., how do learners prefer to communicate? What is the level of their English language and digital skills? Do they prefer to work in groups, pairs, or individually? Do we have learners who could take over leadership? Answering these questions helped them set up learners' groups with different skills.

KICK OFF MEETING WITH LEARNERS

On February 22, 2021, we had a large transnational online meeting with all selected teachers and learners from Germany, Italy, and the Netherlands. It was a great opportunity for young people from 3 European countries to learn their international peers, to talk about themselves and to communicate with others in English. We were very glad to see the openness of learners and their willingness to collaborate transnationally!

Fig. 3: Transnational kick off meeting with learners & teachers (own image).

During this meeting, we also agreed on the composition of working teams as follows:

- 3 transnational working teams consisting of 6 learners – "leaders".
- To increase the transnational collaboration, each group was composed of at least 2 Dutch, 2 German, and 2 Italian learners.
- Each team of 6 learners was supported by the "backup office": it means, other learners from the 3 participating schools were involved in the project, too. Their tasks were to assist project teams when performing their tasks. This approach help teachers adequately involve all learners from their classes into the project work. In addition, learners from the backup office rotated with leaders each week. Doing so, each learner had an opportunity to step into different roles, this greatly increased their ownership of the project.
- Each learners' group was guided by a responsible teacher from IT, DE, and NL.

Teachers and learners also agreed on some further organizational issues, such as:

- Regular online team meetings once per week (always Mondays, from 15:00 to 16:00);
- Communication channels: the tool Wonder https://www.wonder.me/ was used as communication tool. The benefit of the tool is that it allows virtual communication in a funny and dynamic way – exactly what young people need. Learners could see who was speaking to whom, move their avatars, join a conversation and move to another one. In addition, learners used WhatsApp messenger and Social Media for informal communication.
- Data storage & exchange: Google Drive and later, Augmented Learning Platform.

If you believe, we provided learners with clear instructions regarding what exactly they must do, how to proceed or how to communicate, you were wrong. We deliberately presented only the final output, which is the AR city Map, its purpose, and elements, described possible ways of achieving this goal, and specified the timeline. Remember, we wanted our learners to be creators, decision makers, and team players! Thus, we granted them as many rights and freedom as possible. Teachers acted as tutors providing technical or pedagogical support.
Let's see how it worked!

PHASE 1: DISCOVER

After the follow-up of the kick off meeting, learners' teams started working.
In the very first step, they performed a few desk research tasks: they viewed available sources about Eurocities and learned about Eurocities goals. Doing so, they learned about common values for European cities and main principles of creating a sustainable future of urban places.
In addition, learners viewed short stories about refunctionalisation of some cities provided by CultApp partners.

RESULT OF THIS ACTIVITY: learners got an idea of how any object in their local city could be reused in order to meet the Eurocities goals and therefore to be a step closer to a sustainable future.

WHAT IS EUROCITIES?

Eurocities is the network of 190 cities in 39 countries. Their mission is to improve the quality of life of over 130 million residents through a wide range of activities, such as getting carbon emissions down to zero, welcoming migrants and refugees, or governing through dialogue with their residents. Examples of Eurocities goals: Inclusive society, innovative city governments, prosperous local economy.
Learn more about Eurocities under https://eurocities.eu/!

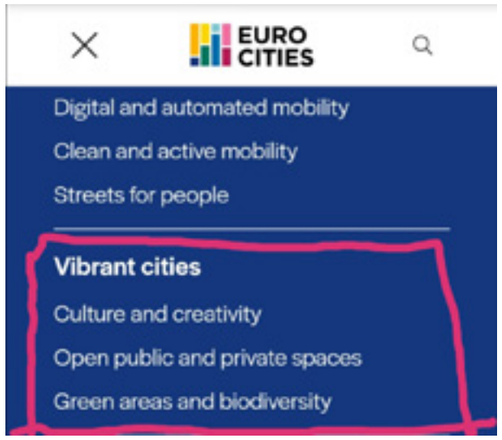

Fig. 4: Desk research on Eurocities goals (own image)

Then learners explored cultural and/or historical assets in their local cities bearing in mind Eurocities goals. Their task was to identify a few objects, the functions of which could be redesigned in line with Eurocities goals, to discuss them within their teams and to select the final ones. This phase could also be described as brainstorming.
Afterwards learners searched for available free images that visualized the selected objects in the past, and/or took their own pictures to show how the objects look in the present.
Task of teachers was to explain learners how to handle with copyright issues. We recommended our learners using images which were attributed to Creative Commons license.

RESULT OF THE DISCOVERY PHASE:

We were greatly surprised by the enthusiasm of our learners, as each team identified up to 5 interesting cultural and historical places in their home cities, and prepared nice presentations and visual materials to explain their choice. As we had a limited time for the AL project, each team decided to work with up to 3 objects from each city.

Following cultural objects were finally selected:

Group 1:
- Bielefeld: Alte Bogefabrik, Botanic Garden,
- Florence: Villa Strozzi Lemon-house, Gasometer,
- Roermond: Christoffel Cathedral, ECI.

Group 2:
- Bielefeld: Barracks, Sparrenburg;
- Florence: Vittorio Veneto Barracks, Ombrellino Villa, Campolmi Factory;
- Roermond: Munsterkerk, the Cuypershuis, ECI.

Group 3:
- Bielefeld: Loom mall, Boulevard, Citizen park,
- Florence: Banti Hospital, Santa Maria Novella Train Station, Former Supercinema;
- Roermond: Train station, Arresthuis, the Cuypershuis.

Fig. 5: Selected cultural objects from Bielefeld, Roermond, Florence (own images)

PHASE 2: UNDERSTAND

During the phase UNDERSTAND, learners from each team analysed in details different data about the past and presence of the selected objects, such as when and by whom a building was constructed, what was the purpose, what was the evolution of the object, what is its current function. These data were presented in short written stories enriched with corresponding images.
In addition, learners had to critically assess whether the current functionality of these objects is aligned with the Eurocities goals. If it was not the case, their task was to elaborate an idea of how the present surroundings, or functions of those objects could be redesigned in a way to support Eurocities goals, and put it on paper.
When performing this task, our learners used mood boards to visually illustrate their ideas.

WHAT IS MOOD BOARD?

A mood board is a type of visual presentation, or ‚collage' consisting of images, text, and samples of objects in a composition. It can be based on a set topic or can be any material chosen at random. A mood board can be used to convey a general idea or feeling about a particular topic
(Wikipedia, https://en.wikipedia.org/wiki/Mood_board).

RESULT:

3 group stories about the cultural and/or historical objects from learners' cities enriched with images and learners' ideas about how to reshape those objects towards making them more attractive and sustainable for their cities.

Fig. 6: Past, presence & future of the Alte Bogefabrik in Bielefeld (own image)

PHASE 3: DESIGN

This stage was dedicated to the design of the fictive cities and their components. Based on the previous elaborations, each team planned its own unique futuristic city map, which had to include the selected objects from Bielefeld, Florence and Roermond and be very close to Eurocities. Thus, learners planned different areas and features of their fictive cities, such as:

- Infrastructure (central station, schools, hospitals, public services),
- Industrial area (factories, company headquarters, office buildings),
- Shopping (mall, stores, restaurants)
- Culture district (museums, clubs, workshops/events, stadiums)
- Green neighborhood (parks, green areas, green/eco-housing).

All cities elements were transferred to the city maps. Learners designed the layout of their maps and created a lot of visual materials for their cities, such as sketches of buildings and places, trigger images. The good news is: you can view and use all the samples produced by our learners on the AL platform for free!
An important task was also to create a name for each fictive city and explain the idea behind! The following cities have emerged:

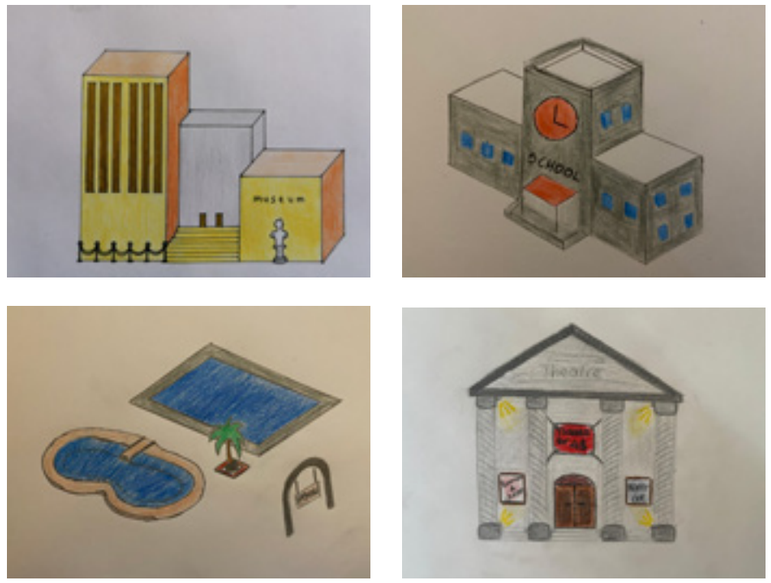

Fig. 7: Elements of the fictive cities (own images)

GREENFALLS:

Greenfalls is a place for people to connect with nature and each other. The main features of the city are its green areas parks and sports grounds, which serve to increase the biodiversity and give people a place to relax and get moving. Greenfalls also has a good infrastructure with public services, housing and culture areas. Yet green spots are all around the city for everyone to be able to enjoy some nature, regardless of where they are. For this purpose, old factory sites from the past are decorated with trees and plants to give the industrial areas a greener appearance in the future. Greenfalls is composed of the historical objects from Roermond (Christoffel Cathedral, ECI, Manhatten), Bielefeld (Alte Bogefabrik, Botanic Garden), Florence (Villa Strozzi Lemon-house, Gasometer).

Fig. 8: Greenfalls - sketch city map (own image)

TRIBUSTOWN

(from the Latin word "tribus"/ tribe): This is a multicultural vibrant city, which preservs and reconnects with culture and nature, bridges the gap between ages and social classes, includes tradition in a modern lifestyle, and is accessible for everyone. Tribustown's old cultural objects support recognizing the past and are used to transform bad memories of the past into a thriving future. Tribustown is inspired by the cultural objects from Bielefeld (Sparrenburg, old barracks), Roermond (Munsterker, Cuypershuis, ECI), and Florence (Former barracks Vittorio Veneto, Campolmi factory, Ombrellino Villa).

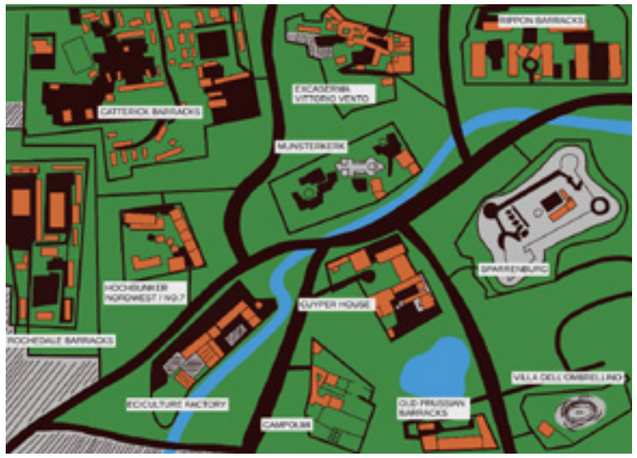

Fig. 9: Tribustown: sketch city map (own image)

EUROFLOBIE:

the name results from mixing and matching Europe's (Eu) cultural buildings, green spaces, and abandoned areas located in Roermond (Ro), Florence (Flo) and Bielefeld (Bie). EuRoFloBie is the outlook of the near future European city: it intends to enhance forgotten places and to offer safe public green spaces, inclusive and accessible, to new generations, in particular, to children and teenagers who, after more than one year of pandemic and lockdowns, want to live in the outdoor spaces of their cities. Young people will be able to meet and spend their time in new sustainable spaces, which will have new functions and will be fully "lived" by young European citizens.

Fig. 10: EuRoFloBie: sketch city map (own image)

As one can see, learners' creativity was greatly demanded!

RESULTS:

3 sketch maps of fictive cities with various visual materials (to be found at AL platform: www.cultapp.erasmusplus.space

PHASE 4: PROTOTYPE

The sketch city maps and all the supporting materials are designed: Now it is high time to turn them into interactive ones through producing Augmented Reality (AR) scenes! The learners' task was to create simple AR scenes for the objects from the fictive cities. For this purpose, we had first to select an appropriate AR app. For the AL project, we decided to use the tool BlippBuilder https://www.blippar.com/build-ar from the AR software company Blippar https://www.blippar.com/ based in the United Kingdom. BlippBuilder is a simple but powerful way to create AR. It includes features such as object recognition, content creation, simulation, usage tracking/analytics, 3d objects.

We have chosen BlippBuilder for the following reasons:

- It offers a free version meaning that AR can be created without any costs;
- The tool is easy to learn: no coding or computer science skills are required;
- BlippBuilder is an online AR development toolkit: This means BlippBuilder does not need to be installed on the computer. AR applications can be created online in a default web-browser like Chrome, Safari, Firefox or Internet Explorer;
- Blippbuilder allows to add a layer of interactivity to the printed materials, anything from a poster, a print ad, event stand or book.

Before one starts developing the first AR application, a registration at the website of Blippar is required. Follow the link https://accounts.blippar.com/signup/free to sign up for free!
This short video gives an overview of the Blippar BlippBuilder tool:
https://www.youtube.com/watch?v=aDGOR9_lIF8&t=36s

The video below demonstrates how AR scenes can be created using BlippBuilder:
https://www.youtube.com/watch?v=2MCs7UpSGyc&t=2s

After having learned how to use BlippBuilder, our learners started creating their own AR scenes. For the most of them, it was the first AR experience ever! Of course, they were guided by their teachers and CultApp AR specialists. Learners were free to choose their own design of the AR scenes. Those with advanced digital and graphic skills showed more creativity in developing AR scenes. Look at the final results in the next chapter!

RESULT:
interactive AR city maps and/or stand-alone AR markers.

PHASE 5: TEST

All AR patterns are built and can be tested. In the test phase, learners tested their AR objects and, where applicable, integrated any improvements. We suggest you testing the developed AR scenes, too!
What do you need in order to test the interactive AR city maps? Below we will present a concrete algorithm, yet notice the most relevant components of your AR experience:

- mobile device with the installed AR app (in our case, AR Blippar),
- internet access (WLAN or cellular),
- trigger images (AR markers),
- corresponding test codes for the produced AR markers.

We collected all AR markers and corresponding test codes for 3 fictive cities in a single Power Point presentation, which is attached to this Publication. Feel free to download it and discover the cities!

Here we present you an appetizer – AR image of Sparrenburg located in city of Bielefeld. Follow the instructions below and discover the past, the presence and the future of this cultural asset.

Fig. 11: AR image of Sparrenburg, Bielefeld (own image). Test code: tribustown

HOW TO INTERACT WITH THE AR IMAGES?

1. Download the app Blippar (for free) on your mobile devices:
   we recommend using following download links:

Available on the App Store

ANDROID APP ON Google Play

2. Open the app and enter the test code of the AR object you want to experience.
3. Scan the corresponding trigger picture/object with your smartphone camera (make sure that you entered the correct test code for the AR marker concerned).
4. Press the button Scan and wait until the AR scene ("Blipp") loads (progress will be indicated).
5. You should be able to interact with the displayed AR scene: If everything run smoothly, you will see different dots on the screen like showing in the image below:

Fig. 12: City Tribustown - experiencing the Cuypershuis with Blippar App (own image)

The user can navigate through the different stages past, present and future. Just click around and enjoy!

Fig. 13: Screenshots of the displayed AR scenes in Blippar - Old Barracks (own image)

6. If loading process does not start: make sure that you used lower case letters when typing test codes resp. that you used a correct test code for the trigger picture concerned. In addition, make sure that the trigger picture is fully covered by the smartphone camera.

Have fun!

PHASE 6: ROLL OUT

The 'Roll out' phase mainly refers to the wider dissemination of the three AR city maps. We believe, the presentation of the project results to wider audience could greatly contribute to a better appreciation of learners' work by their peers, but also inspire other teachers and learners to try similar AR projects in their teaching and learning!
Our teams also carried out a few events aiming at sharing the project results with local and regional stakeholders.
The first sharing event of the three AR city maps was the plenary meeting held online through MS Teams on 17 May 2021. The meeting was attended by all the project mentors, teachers and learners from ITT Marco Polo, Berufskolleg Senne, and BC Broekhin. Each group of learners proudly presented their AR cities, the vision and ideas behind, talked about their experience with working in international teams.
In the following weeks both the schools participating in the AL project and other CultApp partners (NART, Paiz, Effebi, ITT Marco Polo, FHM and Agorà Nieke) implemented numerous dissemination initiatives, from the publication on their institutional sites of the presentations of the AR city maps, to the sharing of the three visionary AR city maps with some local stakeholders (journalists, principals and teachers from other schools, municipalities, university and high tech societies representatives etc.), by letting the people present at the events experience AR city maps with Blippar.
Mainly thanks to the organization of Multiplier events across CultApp countries (some of them in F2F mode, others in blended mode) it was possible to widely spread the AL project results. In addition, these events stimulated a discussion about the benefits this European experience has offered the learners regarding individual learning and managing peer-to-peer relationships. Thanks to the involvement of local stakeholders and their feedback, new ideas about the follow-up of the project have emerged. Moreover, the debates have encouraged many other iVETs to adopt instruments based on Augmented Reality to increase learners' involvement and to find out new ways to promote, enhance and safeguard the European artistic and cultural heritage.

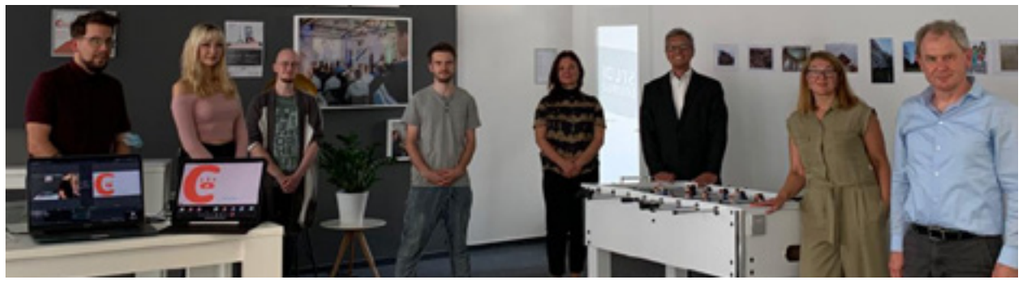

Fig. 14: Hybrid Multiplier event at the FHM Bielefeld with learners and teachers from BKS Senne and approx. 30 virtual guests (own image).

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PHASE 7: EVALUATION

The evaluation of the AL project was an essential element for its improvement. Evaluating means enhancing the implemented activities, highlighting their positive features and strong points, but also proposing improvements starting from what may not have worked. Evaluations are necessary to give all participants the idea of being active parts of the project. The learners should feel like they have carried out their own project autonomously. Moreover, they should have the opportunity to give their own feedback on the activities and offer valuable suggestions.

We especially realized it was fundamental to conduct the evaluation at two different moments: in progress (interim evaluation) and at the end of the project (final evaluation). We chose to evaluate the activities also in progress since we knew that AL project work will be the result of the collaboration between groups of teachers and learners of different geographical origin, culture, teaching and learning approaches. Furthermore, we introduced an innovative pedagogical approach, which aimed at making learners to the key project players. Therefore, it was important to carry out an intermediate check on how the participants perceived the assigned tasks, how the communication run, whether everyone was able to listen to each other in the culturally mixed context.

INTERIM EVALUATION OF THE AL PROJECT:

The interim survey involved learners and their teachers participating in the implementation of the Augmented Learning project in Germany, Netherlands, and Italy. They were asked to fill in a Google Forms available under the following link: https://forms.gle/JJU78522tREWZxay7.
Altogether 28 questionnaires were filled in, 23 by learners and 5 by their teachers. The interim survey results showed that some learners and teachers were slightly confused by the suggested project approach, which rather relied on the autonomous work of participants: ("... the general idea although was clear in the mind of the project managers, this was not for students and teachers. This in turn has created some confusion"). Another point was lack of clarity in the roles within the groups, which caused initial confusion and disorientation of learners ("I didn't know what I was meant to be working on until a couple weeks in.").
On the other hand, most of the learners stressed that taking part in the project so far was an engaging and interesting experience that enabled them to acquire new knowledge about their city, to develop relational skills and to improve their ability to communicate in English, which certainly represent the added value of the whole project ("... I'm meeting new people and I'm working and researching about art, pla-

ces and history of my city". "Actually I expected to have some problems of communication especially among the students which come from different background and which have different approach of relations with their teachers.").
The interim evaluation allowed us to adjust the work organization in the subsequent phases, and it became a means of orienteering, dialogue, and mediation inside the three international learners' groups.

FINAL EVALUATION OF THE AL PROJECT:

The evaluation, carried out at the end of the entire project after the presentation of the final results, made it possible to highlight the overall learning experience of the participants.

The final survey involved learners and their teachers participating in the implementation of the Augmented Learning project in Germany, Netherlands, and Italy. They were asked to fill in a Google Forms available under the following links:
https://forms.gle/qwEgvezaVBWrLyZL8 (for learners);
https://forms.gle/hDAYPdV6AAsRXqHQA (for teachers).
We were interested in receiving respondents' feedback on the following dimensions of the AL project:

- General satisfaction with the AL project;
- Skills and competences gained;
- Changing behaviours regarding Cultural Heritage;
- Lessons learnt.

In total, 7 teachers and 14 learners filled in the final evaluation questionnaire.
As for the impact on the teaching staff, we can state that the use of digital tools gave an important input to the strengthening of their professional skills. Moreover, also communicating in English in different contexts and organizational and managerial skills related to work and resources, were highly appreciated. Finally, teachers could observe and share other educational and organizational models.

The teachers' response, despite initial perplexities about the organization of the project activities ("I would prefer to have more organization and permanent agreements, but the subject of future-cities in combination with AR is a good idea! I would also prefer to use it in „everyday life" with trigger-pictures in the real city") is overall positive, and the vast majority of teachers (85%) would recommend taking part in other European initiatives involving international learners and teachers: "All teachers should have the opportunity to learn what students are capable of when they can make their own choices".

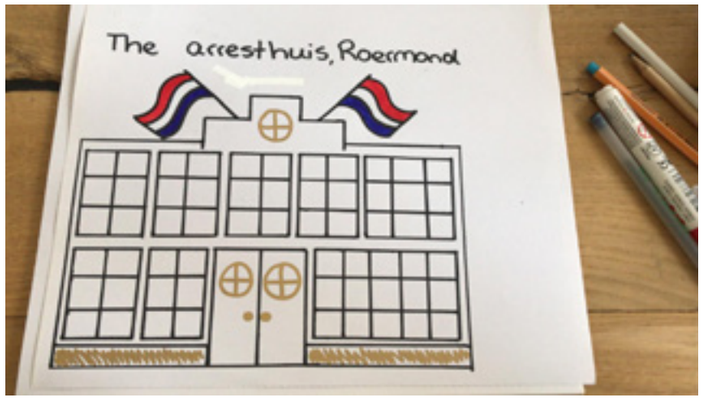
As for the impact on learners, over 70% of them stated to be very satisfied with the whole project. The learners of the various countries and with different cultural backgrounds particularly appreciated the chance to debate and to work with their peers. Please note that the learners were on average 16–18-year-olds, and for the most of them it was their first international experience!

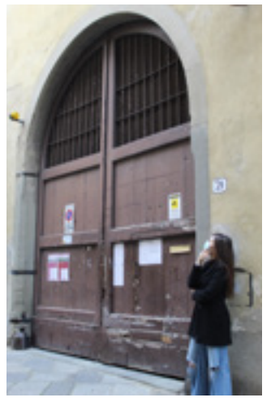
Moreover, another relevant competence for numerous learners was the acquisition of skills related to the use of digital tools, first the discovery of new chatting online platforms (MS Teams, Wonder.me), and the software Blippar for the creation of AR applications.

A very high number of learners (86%) would take part in other similar projects, above all, for the chance to exchange their ideas among peers and to make friends ("It's one of the best opportunities I've gotten in my (school) career so far. I've made friends all around Europe which is amazing! It's definitely something that needs to be continued, because it's an experience like no other!!"), or to acquire problem solving skills and to see a project idea actually carried out thanks to new digital tools ("I've learned so much from this project, not just technical stuff but my way of team working and communication have been improved so much in this relatively short period of time. I'd definitely want to experience an international project (like this) again, even just for the social part of it, all the extra's made it even more amazing than it already was!").

To sum up: the AL project was an exciting experience for learners and teachers, which gave them a chance to explore various cultural places in their home and foreign cities in a joyful way, demonstrated the power of Augmented Reality, and opened new horizons for the transnational collaboration and exchange.

Fig. 15: Certificate of Achievement (template) issued to the participants of the AL project.





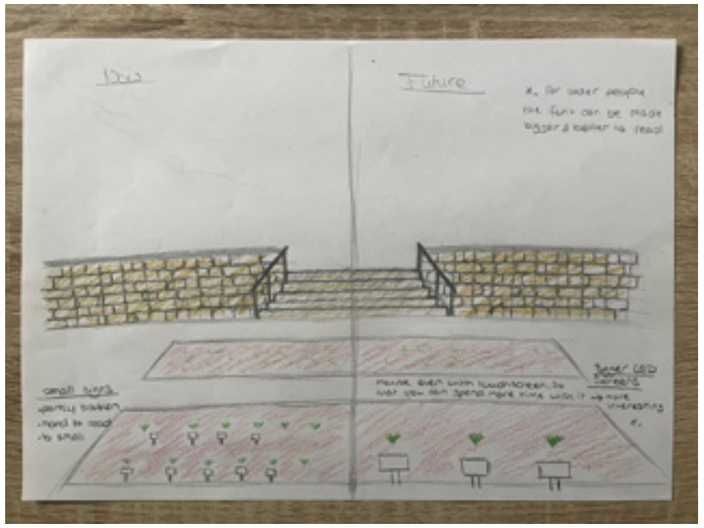


Fig. 16

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CONCLUSIONS AND OUTLOOK

What did we learn from the Augmented Learning Project Work? First, we were greatly surprised by the enthusiasm and willingness of both, teachers, and learners, to undergo this fully virtual pedagogical experiment in times of COVID-19 crisis and would like to heartily thank all of them for their exceptional commitment, openness, creative ideas and, of course, outstanding results!

Looking back to the begin of the project, we realize that we set, indeed, quite ambitious goals. We wanted learners to not only discover Cultural Heritage through Augmented Reality, but also to develop various transversal competences, which are important in the today's society, such as creativity, critical thinking, curiosity, decision making, teamwork, collaboration, intercultural competence. Considering a quite tight schedule of the project and present health crisis, our learners mastered this challenge and proved the viability of the project idea and of the pedagogical strategy selected. Learners' and teachers' feedback provided by the end of the AL project has convinced us that the journey itself was the reward. That's why we can recommend adopting and extending our approach to other vocational schools, which are looking for innovative teaching and learning formats to be applied.

When presenting the AL project results to regional and national stakeholders in the Cultapp countries, we talked about the opportunity to sustainably integrate similar projects into vocational education curricula. Hereby innovative cooperation models between VET schools, local municipalities, tourism agencies, cultural educators could be very effective. For example, a tourism provider wants to promote any cultural place in a region and looks for innovative solutions, which could be designed by teachers and learners from a vocational school specialized in Media Design in a framework of a joint AR project or internship. All parties could benefit from this cooperation and jointly promote Europe's Cultural Heritage.

We believe, there are many ways and opportunities to foster the common Europe's Cultural Heritage. Openness, creativity and innovation are the key toward it!
We wish you a lot of fun and an unforgettable learning experience when discovering Europe's cultural places!

Your CultApp team