Strategic Action plan for long-term transnational partnership among different types of organisations in improving of educational process in regions of Ludbreg, Bratzigovo and Kochani by using of innovative methods and best practices

INTELLECTUAL OUTPUT O3

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1. Introduction

There is a growing interest nowadays of using immersive technologies to promote Cultural Heritage, to engage and educate visitors, tourists and citizens. Digital heritage (DH) is the use of digital media in the service of preserving cultural or natural heritage.

The main aim of digitization of cultural heritage is to enable the permanent access to specific cultural achievements (from three targeted regions in Croatia, Bulgaria and North Macedonia) starting from historical objects, paintings and/or traditional craftsmanship, up to local/regional traditional folklore music and/or dances to any interested person, regardless of his/her location on the world map.

Project main objectives are:

1. Development of innovative educational approach with introducing of Digital Heritage in education process by using of 360-degrees videos.
2. Establishing of a teachers network for transnational cooperation by using of eTwinning networking module.
3. And promotion of advantages of long-term transnational strategic partnership among different type of organization in development of innovative educational methodologies.

Specific Project specific objectives are:

1. Increasing teachers' skills and competences in using of innovative "state of the art" VR technology /360-degrees videos/ in the educational process, with educational approach that will lead to reinforced creativity in education.
2. Creating of Digital Heritage 360-degrees videos enhanced by animated 3D elements for promotion of cultural heritage in targeted regions in Croatia, Bulgaria and North Macedonia (min 9 - 3 per each country).
3. Increasing of students' interest and overall acknowledgement about importance of Cultural Heritage preservation.
4. Enhancing students' skills development and reinforcing of their creative potential.
5. Improving of students presentation skills (for the best students from three schools).
6. Establishing of transnational teacher's network by using of eTwinning networking module.
7. Creation of a strategic Action plan with developed realistic actions/projects for the future transnational cooperation in the field of education.
8. To present in front of the relevant stakeholders on local regional and national level an advantages of new developed "learning by doing" Digital Heritage-based educational method e.g. use of the high level ICT technology in Cultural Heritage preservation.

Taking into account project objectives and project activities, the purpose of this document is to establish a basis for strategic cooperation and transnational partnership in the field of education between the municipalities of Kochani, Ludbreg, and Bratsigovo by involving representatives of the local, educational, and civil sectors.

Education is a key element for the social and economic life of the society. The power of quality education gives results at two levels: 1) the level of personal development of a citizen and 2) the level of development of the society.

At an individual level, education allows people to gain knowledge, skills and form an approach for critical thinking and thus making a choice in the direction of improving their quality of life.

At the social level, education is a strategic sector which influences the overall development of the community. In fact, education is of strategic significance for the development of the society within one municipality/region.

Educational curricula for students from 7 to 15 years of age in Bulgaria, Croatia, and North Macedonia are identical to a great degree, but emphasis of the current project is given to: ICT in teaching, new modern technologies like VR (virtual reality) and AR (augmented reality) which could be introduced into the educational sector, and the "learning-by-doing" approach in primary schools. The process of strategic planning aims to jointly define a vision for the future, to set priorities, to present possible actions and resources within the three regions, and to ensure that councilors, mayor, school representatives, civil society representatives and other stakeholders who are involved in the process will support the realization of the common goals of project "*Introducing of Digital Heritage in educational process – Digital Heritage EDU*", funded by the Erasmus+ Program. The strategy contains a vision for development of the strategic partnership between the educational stakeholders of the three participating regions, good examples at an EU level, as well as the strategic priorities and measures for achieving the identified vision. The strategy sets some activities which could be implemented jointly by stakeholders by defining some concrete actions and initiatives for future cooperation.

2. Description of existing situation in primary school educational processes in regions of Bratsigovo, Kochani and Ludbreg

2.1. Overview of the Educational System in Bratsigovo, Bulgaria

Educational System in Bulgaria – national level

The Pre-school and School Education Act (effective from 1.08.2016) provides the legal foundation for the overall education system in the country and establishes the right of citizens to continuously enhance their education and qualifications. The Act recognizes the right for education for all children; guarantees equal treatment regardless of their ethnic or social background and residential locality; ensures conditions and provides opportunities for further development and accomplishment of a high level of knowledge in the system of education.

Bulgarian education system has traditionally been organized within the public sector. However, a number of private schools exist at different levels of schooling. The education in Bulgaria is mainly supported by the state through the Ministry of Education and Science (MES). Financial autonomy is given to schools by financial decentralization and the so-called "delegated budgets". The financial decentralization transfers rights and obligations that are related to the constitution and execution of

a budget (delegated budgets). Schools have more operational rights in relation to budget constitution and expenditures, and execute their own independent policies.

Education and training of children starts in kindergartens. They may be public, municipal or private, depending on the type of their budget. Kindergartens are for children at the age between 3 and 6 (when they begin first grade). Pre-primary groups for children aged 5 and 6 are compulsory and may take place either in a kindergarten or in a primary school. School readiness is assessed at the end of pre-school education stage by comparing acquired learning outcomes with the learning outcomes described in the state standards. A Personal portfolio is issued at the end of pre-primary stage.
School education is free at pre-primary, primary and secondary level in the public sector. It is compulsory for children between the ages of 5 and 16 (0-8 grades). The levels of schooling in Bulgaria are:

- Primary education (grades 1 - 4 inclusive)
- Pre secondary education (grades 5 – 7 inclusive)
- Lower secondary education (grades 8 - 10 inclusive)
- Upper secondary education (grades 10 - 12 inclusive)

Schools in Bulgaria are state, municipal, private or spiritual and as according to the type of training and teaching they provide – non-specialized and specialized. According to the stage or degree of education, non-specialized schools are:

- primary (I - IV grade inclusive)
- elementary (I - VII grade inclusive)
- secondary (VIII - XII grade inclusive)
- unified (I - X grade inclusive)
- high school (I – XII inclusive)

According to the content of training, the secondary schools can be

- profiled
- vocational

Special profiled-schools shall include in-depth competences in a specific profile in accordance with the state education standard for the special profile education.
Special profiles are the following:

- foreign languages
- humanities
- social sciences
- economic development
- software and hardware science
- entrepreneurship
- mathematics
- natural sciences
- visual arts

- music
- physical education and sports

Vocational training shall include competences needed for the acquisition of vocational qualifications, as well as for the meeting of the eligibility requirements of the occupation or profession, if any, including regulated professions and occupations.
Vocational high schools shall aim at attaining the state education standard for the acquisition of vocational qualifications during the two gymnasium stages of the secondary education degree course.
There can be also innovative schools, which are declared such upon an ordinance of the Council of Ministers and those schools should constantly achieve improvement of education quality by:

1. Developing and introducing innovative elements regarding the organization and / or content of the training;
2. Organizing in a new or improved way the management, the training and the learning environment;
3. Using new teaching methods;
4. Developing innovative training content, school curricula, and school plans.

Specialized schools train experts in specific fields like sport, arts, culture and the needs of religions. Specialized schools are:

- Sport schools (V to XII inclusive)
- Culture schools (grades I to XII, V to XII, or VIII to XII inclusive);
- Arts schools (grades I to XII, V to XII, or VIII to XII inclusive);
- Spiritual schools (grades VIII to XII inclusive).

The primary education starts normally when a child turns seven, but it is not uncommon for parents to consider their children able to start the 1st grade at the age of six. After finishing the fourth grade, students get a certificate for elementary education. To get a basic education diploma, students can go to a lower-secondary school or choose to attend a general secondary school.
In most schools, the school year begins on 15th of September and continues till 15th or 30th of June. Each school year has two terms. In most of the secondary schools, competitive exams for admission are required. Pupils can choose from a number of various types of schools, each offering a different focus (such as mathematics and sciences or foreign languages).
All Exams and External National Examinations are as follows:

1. Primary education – 4th grade (10/11 years of age)

National External Assessment in the following subjects: Bulgarian Language and Literature, Math, Man and Nature, Man and Society

2. Lower Secondary Education – 7th grade (13/14 years of age)

National External Assessment in the following subjects: Bulgarian language and Literature and Math. Optionally, students may sit a third exam in Foreign Language.

3. First Stage of Secondary Education – 10th grade (16/17 years of age)

National External Assessment in the following subjects: Bulgarian language and Literature, Math, The exams are in test format. Optionally, students may choose to sit and exam in foreign language and IT.

4. Second stage Secondary Education – 11th – 12th grade (18/19 years of age)

National External Assessment in the following subjects: Bulgarian language and Literature, Math. The exams are in test format. Optionally, students may choose to sit and exam in foreign language.

Educational System in Bratsigovo Municipality

The municipality of Bratsigovo has a well-functioning system for pre-school and school education, upbringing and personal support, which are provided in kindergartens and schools. The education system is well organized, staffed and equipped and provides general and vocational training for students.
The available network of educational institutions has an optimised structure, in line with the current legal and regulatory documents and regulations and with the local, state and European strategies for the development of education.
In the school year 2019-2020 on the territory of Bratsigovo municipality there were 4 municipal schools: one secondary school - "Narodni Buditeli" Secondary School – Bratsigovo, one primary school - "Vasil Petleshkov" in the town of Bratsigovo. Two elementary schools - "Hristo Botev" Primary School in the village of Byaga and "Hristo Botev" Primary School - village of Isperihovo. There is also no Centre for Support of Personality Development, as these functions are performed by the Centre for Community Support at the Complex for Social Services for Children and Families - Bratsigovo and the community centres.

Table 1: Comparative data for schools in Bratsigovo municipality by school year

School years	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
Number of schools	5	5	4	4	4
Number of teachers	78	80	66	65	59
Number of classes	41	44	38	33	31
Numbers of students	678	645	585	444	456
incl. men	343	414	308	240	236
Incl. women	335	231	277	204	220

All children with special educational needs on the territory of the municipality are integrated in the municipal schools.
The structures of pre-school education in the municipality are well developed. The provision of kindergartens, teachers and places in kindergartens is very good and fully meets the needs. The kindergarten capacity of 245 places is sufficient to cover all children from 3 to 7 years of age. For every 100 children in Bratsigovo municipality by 2020 there will be 123 places in kindergartens.

By 2020, the structure of pre-school education in Bratsigovo municipality includes 4 kindergartens with a total of 2 nursery groups, 5 mixed groups and 6 combined preparatory groups for children aged 5 and 6 with a total number of children as of 01.09.2020 – 246. The kindergartens are "Zdravets", Bratsigovo; "Slance", village of Isperihovo; "Cvetno Hvarchilo", village of Byaga and "Valshebstvo", village ofKozarsko. There are no center and protected kindergartens.
The kindergartens admit children aged 3-7 years, at the parents' request (according to the Law on Preschool and School Education (LPSE), Ordinance No. 5 on pre-school education and the Ordinance on the conditions and procedure for enrolment, withdrawal and transfer of children in the municipal kindergartens on the territory of the municipality of Bratsigovo), and the groups are formed according to age.

Table 2: Comparative data for municipal kindergartens by school year

School years	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
Number of kindergartens	5	5	4	4	4
Number of groups	13	13	10	10	10
Teaching staff	24	25	22	22	22
Number of children	297	261	216	214	228
incl. men	164	134	105	109	98
incl. women	133	127	111	105	101

The number of children enrolled in kindergartens decreased by 33% for the five school years shown in Table 2. In 2019/2020 school year, kindergartens in Bratsigovo municipality are attended by 228 children, divided into 10 groups and taught by 22 people teaching staff.

Table 3: Number of children in municipal kindergartens as of 01.09.2020

Kindergartens	Number of children
Kindergarten "Zdravets" - Bratsigovo	106
Kindergarten "Slynce" - Isperihovo	84
Kindergarten "Cvetno Hvarchilo" – Byaga	38
Kindergarten "Valshebstvo " - Kozarsko	18
TOTAL	**246**

The employed teaching and non-teaching staff as of September 2020 is 125 people in total, with a tendency towards redundancy.
In kindergartens the education of children with special educational needs is supported by a resource teacher according to their needs. The number of resource teachers is determined by the number of children and pupils with Special Educational Needs (SEN), the type of support and the number of hours of resource support.

Potential weaknesses (Bratsigovo, Bulgaria):

- Insufficiently qualified teachers.
- Need of more equipment - VR, AR, 360 degree camera recording equipment.
- Lack of financing of ICT projects in schools.
- Education is mainly focused on theory, while practical trainings are lacking.

2.2. Overview of the Educational system in Kochani, North Macedonia

Educational system at national level

Education in North Macedonia is compulsory between the ages of six to 19 for general secondary education, or from six to 17, 18 or 19 for vocational education and training depending on the selected VET track.

The educational system in the Republic of North Macedonia consists of three sub-systems:

- **Primary education** (ISCED 1 and ISCED 2): in duration of nine years, free of charge and compulsory for all children aged 6 to 15, with no regards to the gender, religion and nationality. The primary education activities are defined and regulated by the Law on the Primary Education and with the Concept for Nine-years Primary Education. The mission of this sub-system is to raise, educate and guide. In the first three grades the assessment of the pupils is descriptive, and for the rest of the grades is numeric (marks 1 to 5). Private primary education schools are not recognized in Macedonian education system. However, private primary schools exist and their pupils are mainly of foreign citizenship.There are 347 primary schools in the country (around 1100 including satellite offices).
- **Secondary education** (ISCED 3): general secondary education (Gymnasium) in duration of four years and vocational education (Vocational Schools) in duration of two (vocational education of two years), three (vocational education for professions) or four years (vocational technical education). The secondary education is compulsory and comprises all children in the age cohort 15 to 19 years for the general secondary education, and for the age cohort 15 to 17, 18 or 19 in the VET depending on the selected track. The activities and responsibilities of the secondary education are defined and regulated with the Law on the Secondary Education and the Law for Vocational Education and Training. The secondary education is free of charge in the public secondary schools. The pupils also have the legal option to enroll into the private secondary schools which are officially recognized by the educational system of North Macedonia; there are 16 private secondary schools in the country. In several schools in the country there are bilingual classes in which the teaching of non-language subjects is performed in foreign language (French or English); In total there are 124 secondary schools, 108 are public and the remaining 16 are private. Of the secondary public schools, 23 are gymnasiums; 43 are professional; 33 also offer gymnasium and vocational education; 4 schools are for students with special educational needs; and 5 are art schools.
- **Higher education** (ISCED 5, 6 and 7): implements under-graduate, master and doctoral studies in the higher educational institutions and institutes which are autonomous and independent. There are seven state universities and 14 private universities in the Republic of North Macedonia. The activities are defined and regulated by the Law on the Higher Education. In accordance to the national policy for provision of equal access to the higher

education, social cohesion and lifelong learning, the state introduced the Project 35/45, which promotes enrollment of the students from the age cohort 35 to 45 years.

The educational system comprises also the children with special needs and who are enrolled in the schools for special education or within the regular teaching process depending on the preferences of the students and their parents. There is separate curriculum for these schools.

General Information on the Educational system in Kochani municipality:

In municipality of Kochani there are six primary schools, one of which is a musical school and there are two secondary schools.
The situation in the primary schools in the school year 2021/22 is as follows in the table below:

Primary school	**Number of students**	**Number of classes**	**Average number of students per class**
PS "Krste P. Misirkov"	209	19	11
PS "St. Cyril and Methodius"	955	48	20
PS "RadeKratovche"	504	30	17
PS "MalinaPopivanova"	485	33	15
PS "Nikola Karev"	480	37	13
TOTAL	**2633**	**167**	**16**

As for the Secondary schools in Municipality of Kochani, the situation in the school year 2021/22 is as follows:

Secondary school	**Number of students**	**Number of classes**	**Average number of students per class**
SS "Ljupcho Santov"	577	52	11
SS "GoshoVikentiev"	640	35	18
TOTAL	**1217**	**87**	**14**

From August 5th, 2019 (National gazette 161 of Republic of North Macedonia), there are changes in the national Law for education that emphasize the inclusion of the children with special needs and working systematically with the gifted and talented children.

Potential weaknesses (Kochani, North Macedonia):

- Insufficiently qualified teachers.
- Need of more equipment - VR, AR, 360 degree equipment.
- Lack of financing of ICT projects in schools.
- Education is mainly focused on theory, while practical practices are lacking.

2.3. Overview of the Educational system in Ludbreg, Croatia

Eight-year elementary education in the Republic of Croatia is compulsory and free for all children at the age of six to fifteen. This refers to all children with permanent residence in the Republic of Croatia, irrespective of their citizenship.

There are three segments of elementary education. Compulsory elementary education conducted in regular elementary schools and special institutions for students with developmental difficulties, art education in elementary music and dance schools, and elementary education of adults conducted in regular schools and specialized institutions. Elementary music education is also conducted in certain regular elementary schools, as a separate educational program.

The orientation of the Croatian and national educational policy towards creating and developing a knowledge-based society is contained in the document titled Education Sector Development Plan for 2005 - 2010, which was adopted by the Government of the Republic of Croatia on June 9, 2005.

The changes have been initiated on all the levels of the educational system. The basic objective of the change is to improve the quality and advance the educational system on all levels.

The Croatian National Educational Standard has been created as a basis for the changes in the teaching programmer and work methods in the elementary school system for the purpose of developing the "school tailored to pupils". The purpose of the CNES is the unburdening of the workload by abandoning redundant educational programs, introducing modern teaching methods based on research- based classes and individual and group work and applicable knowledge and skills.

Secondary education is provided for everyone, after completing primary schooling, under equal conditions and based on individual capability, the opportunity to acquire knowledge and the competence needed to enter the labor market and to undertake further education at higher education institutions.

Secondary education is provided by secondary schools and other legal persons and includes various types and forms of instruction, education, qualification and training that are carried out according to the provisions of the Primary and Secondary School Education Act (Official Gazette of the Republic of Croatia, 87/2008, 86/2009, 92/2010, 105/2010-cor., 90/2011, 16/2012, 86/2012, 94/2013 and 152/2014).

Secondary school institutions are: secondary schools student's dormitories.

Secondary school programs are as follows:

• secondary school diploma programs;

• secondary profession degree programs;

• basic professional degree programs;

• qualification and training programs.

Secondary schools, depending on the type of the program they offer, are as follows:

• gymnasiums;

• vocational or trade schools;

• art schools.

Gymnasiums prepare you for further education at higher education institutions, vocational schools prepare you to enter the labor market or provide you with the possibility of continuing education at higher education institutions, and art schools acquire knowledge, develop skills, abilities and creativity in different artistic fields.

Local level – Town of Ludbreg

Pre-school education in Ludbreg is available in three kindergartens which have capacity for three hundred children from Ludbreg area.

Kindergarten "Radost" Ludbreg has 7 educational groups and one group of the shorter preschool program. The realization of educational work is taken care of by 14 educators and a psychologist as a professional associate, and for other tasks of cleaning, cooking, accounting and organization it has 4 employees. The kindergarten is owned by the local self-government unit of the City of Ludbreg.

Within the regular primary program, children attend English and German language learning programs conducted by educated teachers with a program verified by the Ministry of Science and Education. Children who wish to attend a religious education program of Catholic catechism led by our educators with a completed canonical mandate verified by the competent ministry.

The pre-school program for the elderly children is part of a regular program, and the shorter pre-school program for non-kindergarten children is held in the afternoon. Parents have the opportunity to start with a child's adaptive playroom before enrolling in a kindergarten so that the child can easily adapt and the parent knows about the way they work.

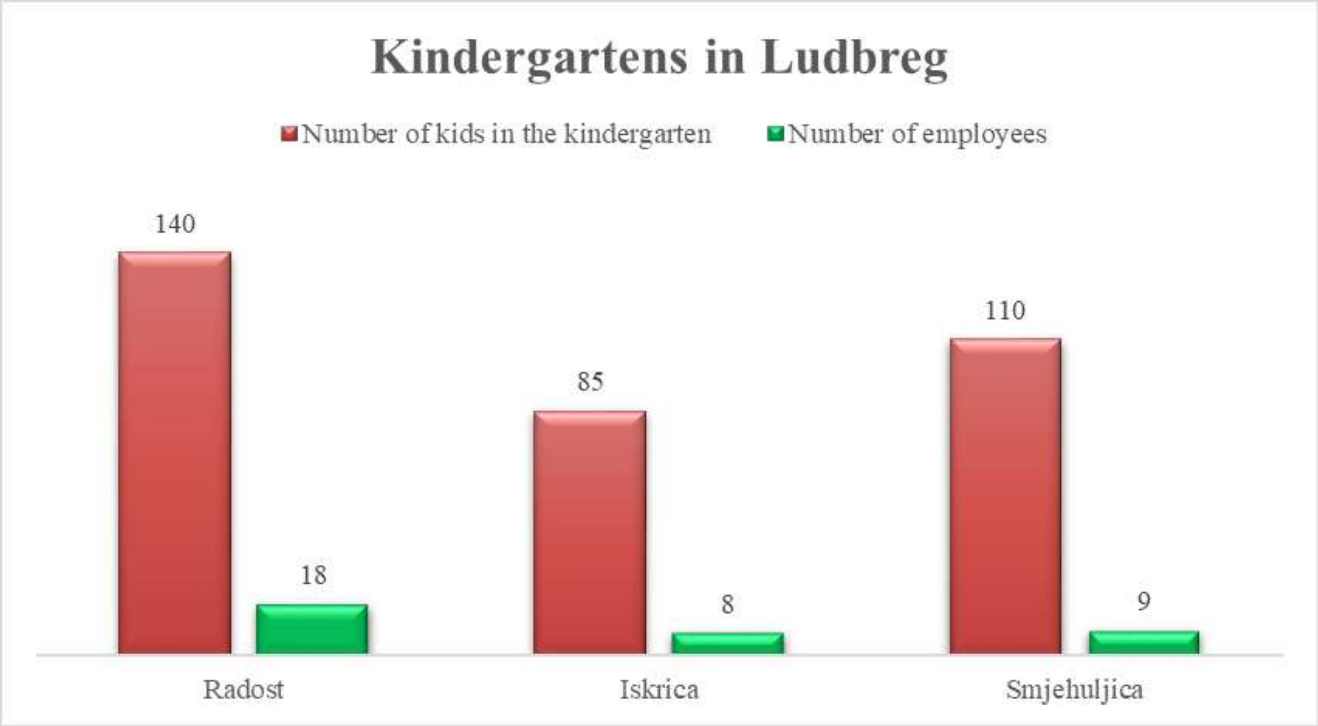
Children with disabilities and children of national minorities are integrated into groups, and assistance with working with provides a psychologist.

Kindergarten participates in all the manifestations of our city and cooperates with associations, institutions and organizations on various projects, with the aim of involving children in the life and work of their immediate environment influenced by other children and parents.

Kindergarten "Iskrica" attends a maximum of 85 children. There are eight employees in Kindergarten. Kindergarten performs a primary comprehensive program of pre-school education, and from short programs it carries out a program of early English language learning, a religious program and a program of work with gifted children. Also, the Kindergarten has an adaptation toy.

The "Smjehuljica" kindergarten currently employs 9 full-time employees. Kindergarten cooperates with 2 external associates, psychologist, logopedist and tutor. The kindergarten starts with a maximum of 110 children in three educational groups: nursery, younger and older kindergarten

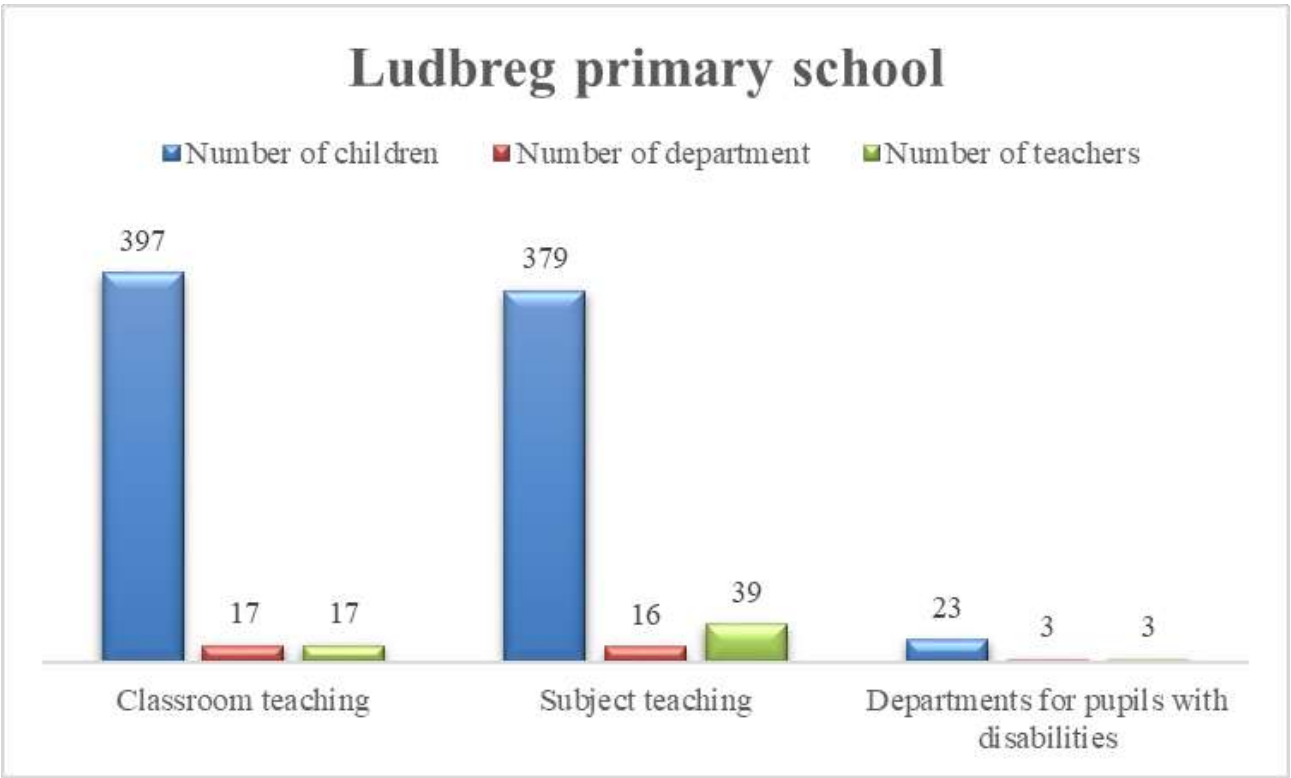
groups. Besides the regular program in Kindergarten are organized religious program and workshops for children.



Ludbreg primary school is a public institution of general education of children and youth. School performs the educational and training activities. Primary education in the Republic of Croatia is regulated by Law of education in primary and secondary schools and therefore primary school Ludbreg implemented mandatory and regular primary education. In addition, performs the activity of basic music education for the following programs: piano, guitar, accordion, block flute, flute, clarinet, trumpet, horn, saxophone, drum and voice development (solfeggio). The school operates on the basis of the school curriculum and the annual plan and program of work.

Today, Ludbreg primary school has a total of 36 departments - 17 departments of classroom teaching and 16 departments subject teaching. School has a total of 938 pupils - 397 pupils from 1st to 4th grade and 379 pupils from 5th to 8th grade. Also, the school has implemented three departments for pupils with disabilities which attend a total of 23 pupils. Music department of school has six departments and enrolls 139 pupils.

Primary school Ludbreg besides regular classes has elective classes in which pupils can choose additional elective subject such as Computer Science, German or Catechism. Moreover, school organizes various extra-curricular activities which seek to activate and motivate pupils to school and learning. Also, through participation in extracurricular activities pupils acquire new skills and competences that can help them throughout their schooling. Some extracurricular activities are: drama, young researchers, creative workshops, art workshops, playroom, reading rooms, sports activities, dance groups, choir, young technicians, first aid and others.



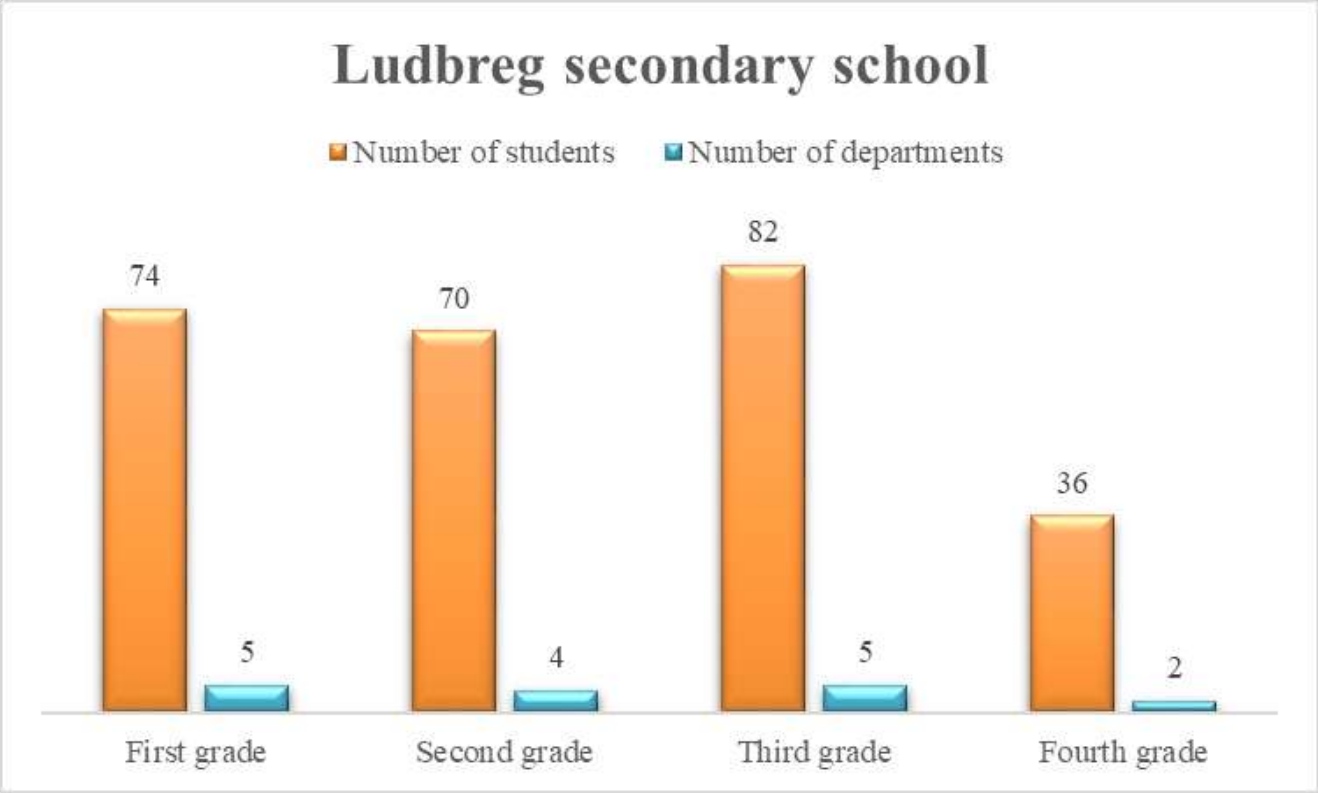
Ludbreg High School provides education in 4 annual education programs:

• General Gymnasium
• Economics - economist
And 3 years of vocational education programs:

• Machine Locksmith, Turner, Baker (JMO)
• CNC operator
• Auxiliary occupations (chef, pastry, gardener) - (TES)

In addition to regular classes at school will run additional courses that will enable students to practically apply the acquired knowledge and creativity, to gain new knowledge, skills, values and attitudes relevant to students so that they could later effectively engage in life. This form of instruction is intended for students who show particular interest or talent in a specific field of study and want to learn more or prepare for all levels of competition.

Additional classes will be organized at a certain time when such a form will be needed for students and will include active didactic - methodical approaches such as workshops, projects, field teaching, observation, tracking and encouragement of gifted students and preparation for competitions. Supplementary education is for those students who have difficulty in mastering a particular part of the course. Such teaching does not have a character of continuity, but will be maintained according to the needs and needs of the pupil from those teaching areas and / or subjects that are needed. Extracurricular activities focus on the development of students' interests and talents in different areas, and will mainly be conducted in the form of work and project teaching as well as foreign language learning.



Potential weaknesses (Ludbreg):

- Lack of practical work at school
- Overload of teaching content - a lot of content that has to be done in short period of time
- *Ex katedra* lecture
- Lack of ICT equipment in primary schools, especially VR and AR equipment
- Lack of use of ICT equipment in primary education
- Lack of knowledge of professors when using ICT equipment
- Education is mainly related to frontal lectures, while experiential knowledge is missing

3. Analysis of the challenges in primary school education

Today, a new look is taken at the organization of the process of primary school education not only in terms of quality, but also in terms of pedagogical relationships, i.e., the whole educational process is organized from the perspective of the child, recognizing him/her as an equal partner in the educational process. Primary school teachers face several challenges on an everyday basis. They often find themselves struggling with establishing the curriculum, dealing with the different needs of children at the same time, and communicating minor details about the kids with the parents.

Within this project we identified what is happening in primary school education in three municipalities – Ludbreg, Bratsigovo, and Kochani.

In this chapter, it will be presented challenges in primary school education for all three regions and alsoadequate measures that have to be taken with aim of its improvement.

Weaknesses of educational system in the three countries:

- Overload of teaching content
- Lack of technology availability - it is hard to purchase specific equipment from kindergarten's budget; the emphasis on teaching with modern technology is more than ever right now and kindergartens are not equipped with the right tools to enable digital education for children
- Lack of transnational cooperation between kindergartens' teachers as opportunity to implement best practices – bussiness classroom, STEM classroom
- Need for development teamwork skills
- Lack of staff and knowledge in working with vulnerable groups
- Lack of interest of the parents for educational aspects

Measures:

- Standardization of learning by doing primary school educational methods
- Primary school classes should have more practical activities.
- Enable the availability of digital technologies in primary schools- Digital technology (DT) may support children's learning and enrich class experiments, strengthen the professional development of educators and facilitate communication between primary schools and parents.
- Creation of transnational network for primary teachers about best practices and sharing experience.
- Enable teachers to acquire additional skills for working with primary school students, training on new learning methods related to current social topics and events, training in the field of working with children with disabilities and vulnerable groups.
- Social inclusion - working with vulnerable groups: inclusive professionalisation for a diverse workforce - continuing professional development of policies that include practice-based learning approaches and special professionalopportunities dedicated to assistants from minority, marginalised or disadvantagedbackgrounds.
- Integration of parents in primary school education.

4. Best practices identified by project partners

4.1. „Learn and work easy in Virtual and Augmented Reality“

The project “Learn and work easy in Virtual and Augmented Reality” started in November 2021 and the end date is October 2022.

The topics of the project: development of training courses, digital content, technologies and Practices, digital skills and competences.

Education and training are key to personal fulfillment, social cohesion, economic growth and innovation. They are also an important element in building a fairer and more sustainable Europe.

The main objectives of the project are:

• Creating conditions for transformation in the curricula of VET institutions in order to adapt to the changing, environment and the requirements of the labor market;

• Analyzing the common needs of different target groups in the field of education and training;

• Capacity building of the organizations participating in the project proposal for work in an international environment;

• Interaction between actors in different sectors who have common interests of change.

In order to reach the project objectives and deliver the planned results the project workflow consists of two sets of activities by the partnership:

- Horizontal activities (managerial, administrative, dissemination to secure smooth partnership collaboration, quality of outputs and results, and outreach of results and outcomes).
- Implementation activities (securing the delivery of project outcomes for the target groups and their direct involvement in the development and finalisation phases of deliverables and outcomes).

Project Results activities as demonstrated in the section Project Results:

Activities towards delivering the Methodological framework for jobseekers and entrepreneurs for work in Virtual and Augmented Reality

- Overall methodology and tools for the analysis
- Quantitative and qualitative primary research accounting for targeted primary data by involving jobseekers
- Development of methodological framework

Activities towards delivering the Handbook for working in VR and AR environment

- Development of the VRAR handbook
- Pilot-testing methodology and pilot testing sessions
- Pilot-testing report (optimisation of training provision upon feedback)
- Activities towards filming Training Video Tutorials on VR and AR
- Preparation of training materials in connection with the presentation of the methodological framework
- Preparation of training materials in connection with the presentation of the manual for work

- Activities' toward organization and conduction of Multiplier events:
- One international Webinar
- 5 Local Webinars

4.2. „ShareEurope: Sharing interactive education in virtual and mixed reality“

In the year 2019 on the 1st of September started the project titled „#ShareEurope: Sharing interactive education in virtual and mixed reality“. The end date of the project is on the 31st of August 2022.

The project general objective is to support the implementation of innovative teaching methods, through integration of virtual and mixed reality (VR and MR) technologies in the educational approaches across Europe. The project general objectives will be supported through the successful achievement of threespecific objectives:

- ensuring high-quality and inclusive education, through enriching learning experiences while supporting effectiveuse of digital technologies and encouraging activities that link learning with real-life experience, through theapplication of virtual and mixed reality;
- empowering teachers and school leaders by strengthening targeted collaboration, learning networks, onlinecommunities and innovative pedagogical practices among teachers and school leaders, and involving otherrelevant stakeholders;
- enhancing European cooperation in the field of school education through building a European Network for VRTechnology in Education for establishment of closer contacts between European schools stakeholders, teachersand school leaders, and supporting policy reforms in the educational field.

The target groups of the project are:

- Disadvantaged groups of students in schools, such as children with difficulties in learning, within culturall diverse communities, as well as those with physical disabilities.
- Teachers from all school grades, more specifically those teaching subjects in geography, history, nature andhuman sciences, ITC;
- School leadership and networks, specifically school managers, influencers in the field of school education,policy and decision makers.

The project delivers the following results:

1. Review of the schools curriculum of the countries included in the project, and shortlisting of lessons for VR/MR adaptation.

2. Developed assignment for 360° VR and Mixed Reality Modules Software Development.

3. Upgraded IEDU360 platform with three new features - teachers and homework tool, Mixed reality tool and 360° VR video content feature.

4. Mixed reality and 360° VR video educational resources database established.

5. The European VR and 360° Image Bank upgraded and enriched within the IEDU360 platform.

6. Developed Standard IEDU360, containing quality standards of 360° capturing and the VR and MR content.

7. Established and operational European Network for VR Technology in Education.

4.3. Program for Gifted children

For gifted children in kindergartens, the implementation of special pre-school education programs is ensured.
Checklists were made and distributed to parents, in order to determine as precisely as possible in cooperation with parents, whether an individual child is gifted or potentially gifted.
According to the completed checklists, we gathered a group of 23 children with enhanced talents in certain areas. We organized a meeting with parents to introduce them to the ways of working with such children and possible challenges they will face with.
We started workshops with detected children on the topic: playroom for the gifted with constructive materials, playroom for the gifted with art materials, playroom for the gifted with math tasks, playroom for the gifted for the childern.

4.4. Project - Friendship as part of socio-emotional development

Children are introduced to different types of emotions, acceptable reactions and behavior, the development of socio-emotional relationships in different situations.

The teachers made a doll of a friend who communicates with the children, goes with them to their home, and has arrived from faraway Africa. Traveling, he meets many countries and many people. In their homes, he encounters different situations and leads the children to talk about it, what he did for them, how he felt and so on.

4.5. Project VR EDUCATION

Project title: Implementation of Virtual Reality based learning methodology in secondary schools, Abbreviated - VR EDUCATION; Contract No. 2019-1-HR01-KA201-060815

Main idea of the project was to create innovative pedagogical and teaching methods which will be based on digital technologies.
The aim of this idea was to teach and encourage educators/teachers and students to collaborate and use technology in a creative and effective way. In present education systems in most of the EU countries, it is becoming very challenging for teachers to motivate students to learn the material presented in the classroom. Surveys made in the project partners secondary schools, in the phase of project idea development, just prove the well-known fact that students easily "get bored" by the academic content presented in formal education process. Traditional teaching methods are focused on providing facts; however, having access to and consuming a lot of information isn't learning. Being informed isn't the same as being educated. Virtual Reality (VR) can motivate students towards academic achievement. By using of VR technology, teachers can attract the attention of students to developed VR education material and make studying process exciting and more effective. VR is on the doorstep of education, and without a doubt, it'll change the world as we know it. New school classrooms will be technologically advanced places of learning, with VR technology, that will allow significantly increasing of students' engagement and learning.
The specific objectives of the project activities were: to develop own innovative ICT - based educational module with utilization of VR technology; to improve students achievements in school subjects with help of VR educational technology; to improve students teamwork skills through the transnational competitive event in the frame of long-term teaching assignment; to establish

transnational teacher's network by using of eTwinning networking modules and to create of a strategic action plan for transnational cooperation in the field of education.
This project was partnership between North Macedonia, Croatia, Greece and Cyprus.

4.6. Project AR EDU

Project tittle: Augmented Reality Education Module - Development and implementation of innovative ICT - based educational tool in STEM orientated school subjects.

The main aim of the project was development and use of new software solution - innovative ICT based educational tool (Augmented Reality - AR learning module) as a non-traditional approach beyond the limits of classic classroom and through it to connect students with STEM oriented school subjects.

Main objectives of the project were:

- to create strategic partnership for transnational cooperation among different socio-economic organizations (education institutions, civil sector and ICT SMEs);
- to improve educational approaches in three secondary schools with new innovative educational tools;
- to increase awareness of the importance of the STEM school subjects;
- to increase students' interest for STEM subjects in school.

Project Results:

- Developed new innovative educational tool **(AR educational module)** that can be used in education;
- Developed **Manual for implementation of AR educational module** in STEM orientated school subjects;
- Established **teacher's network by using of eTwinning** module as the main pre-request for further partnership and cooperation in increasing of teacher's skills and competences by exchanging of good practices;
- Created **strategic action plan for transnational cooperation** among different socio-economic organizations in the field of education;

5. Action plan

In the Action plan all main objectives are turned into real examples of potential ideas which can be implemented by project partners involving various stakeholders in the Educational sector in the next 5-10 years. Activities are presented in an identical way, describing the performer(s) of the activity, timeframe for its implementation, expected results, other potential participants, human resources, as well as prerequisites for implementation of foreseen activities.

Activity 1:

Description of the activity	***Project "Plant the trees"*** It is a well-known fact that temperatures in last decades are gradually increasing. This is due mainly to complicated climate changes, and unfortunately the trend leads to extremely high temperatures in urban territories during the hot season, in the summer period. The main objective of this project is to stimulate a behaviour among citizens which will lead to growing trees and plants in cities, which can eventually form large green parks. These green areas and parks will help fight against an increasing problem in the last decades: the constantly increasing summer temperatures and fighting against the so called "summer energy poverty". Green areas in cities can help mitigate the effect of "heating waves", where city centres experience too high temperatures during summer period and living conditions are becoming aggravated. Green areas will mitigate the effect of "heating waves" by reducing (cooling down) temperatures in European cities during the hot summer period. One of the ways that we can deal with this problem is by developing an app that teaches people how to plant different kind of vegetation and trees and how to take care of them after that, it can be one of the solutions when it comes to fighting the environmental problems. The app will be created to look like augmented reality mobile game that can be downloaded from the app store – the person using it will have to choose the spot and the type of plant or tree that they want to plant and pin it on the map in the app. It will also have the option of sharing a location of the pins, so other people using the app can see it and join if they want to, this way it can be turned into a social activity. The more people are using the app the more trees and plants are been planted. It can even be organized as an event or some kind of competition between different schools, universities and even companies – by using the app they can significantly increase the number of trees and plants on the territory of the participating municipalities.
Performer of the activity	- People willing to download the app and participate in the activities - Schools using the app as a way of teaching students on eco-friendlier way of living - NGOs, public authorities and companies that wish to implement or collaborate with this project - IT company to develop the Plant App.
Expected results	Improvement of: - Knowledge on issues related to protection of environment; - Knowledge on how to be more environmentally friendly; - Basic skills and competences on contemporary topics like clean environment, climate change issues in combination with modern technologies, summer energy

	poverty, etc.
Period of performance	2023-2027
Human resources	- App and web developers; - Experts on topics like environment protection, and climate change issues; - Policy experts from different key stakeholders groups like: public authorities, NGOs, and educational sector; - Communication and dissemination experts; - Teachers educating students through the app.
Budget:	EUR 150,000 – 200,000
Financial sources:	Erasmus+ Programme; Other potential EU programs from the current programming period 2021 – 2027

Activity 2:

Description of the activity	***Project "Eco-builder"*** It is a very harsh reality that taking care of the environment is not one of the main priorities of people nowadays and changing this will be very difficult. One of the ways to make such a big and serious topic more easier for understanding so people can take more steps of creating solutions for fixing the problem is by turning it into a game. By creating an app with mobile game elements you will simultaneously entertain people and raise awareness about problems affecting the environment and solutions to them. The app will use augmented reality technology for added immersion to make the game more realistic and to have a long-lasting impact on the consumer. The gameplay will consist of a player pointing their camera at a building and generating information (statistics) of the given building. With this information the player could compare different upgrades of the building and try to make it more environmental-friendly and to improve its energy performance. Players will acquire knowledge on specific topics like: - Energy audit of a building; - Measures for improving energy efficiency; - Payback period of a refurbishment measure; - CO2 emissions from different energy sources; - Link between saved energy and money saved; Buildings will be graded on their energy performance and given the corresponding level. The higher level a building is the more environment-friendly it is. This way the average player will have more knowledge of building's energy performance improving the students engineering background which will significantly increase their chances on labour market and on the other hand, this will lead to increased number of young people willing to continue their education in universities with technical specialties.
Performer of the activity	- People/students willing to download the app and participate in the activities

	- Schools using the app as a way of teaching students and eco-friendlier way of living - NGOs, public authorities and companies that wish to implement or collaborate with this project - IT company to develop the app
Expected results	Improvement of: - Knowledge on issues related to protection of environment; - Knowledge on how to be more environmentally friendly; - Basic skills and competences on contemporary topics like clean environment projects, energy performance of buildings, and climate change issues
Period of performance	2023-2027
Human resources	- App and web developers; - Experts on topics like environmental protection; - Policy experts from different key stakeholders groups like: public authorities, NGOs, and educational sector; - Communication and dissemination experts;
Budget:	EUR 170,000 – 230,000
Financial sources:	Erasmus+ Programme; Other potential EU programs from the current programming period 2021 – 2027

Activity 3:

Description of the activity	***Project AR nutrition*** Exercise is an important part of keeping teens healthy and this way of lifestyle that is learned in childhood is more likely to stay into adulthood. Most teens spend countless hours each week sitting behind a computer screen and playing video games. So the idea is to use this fact and make exercising and gathering knowledge about healthy food. In order to be able to eat properly, it is necessary to know the nutritional values of certain foods. One of the biggest reasons people drop an exercise program or stop eating healthy is lack of interest. The idea is to create an application that would be run from mobile devices and that would in a fun way stimulate teenagers to acquire knowledge and in the same time physical fitness, which is ultimately a prerequisite for meeting all the demanding tasks in front of them during school and later in life. The concept is based on knowledge of the nutritional values of foods in synergy with physical movement. Simplified if there is less of knowledge of foods nutrition values – there is larger amount of running or walking. And vice versa. At the beginning of the application, it will be necessary to enter data, namely age, height and weight. The data is needed to later have more accurate calculations when calculating calorie expenditure and the data is not stored anywhere except on the mobile device itself. Augmented reality systems based on AR Core technology allow the user to "place" 3D digital objects in real space.
Performer of the activity	- People/students willing to download the app and participate in the activities - Schools using the app as a way of teaching students and eco-friendlier way of living - NGOs, public authorities and companies that wish to

	implement or collaborate with this project - IT company to develop the app
Expected results	- health promotion in children - use of AR-based ICT technologies in education - adoption of new educational approaches - Student-centered learning
Period of performance	2023-2027
Human resources	- App developers - Experts on topics health and nutrition - Policy experts from different key stakeholders groups: public authorities, NGOs, and educational sector - Communication and dissemination experts
Budget:	EUR 100,000 – 150,000
Financial sources:	Erasmus+ Programme Other potential EU programs from the current programming period 2021 – 2027

Activity 4:

Description of the activity	***Using of VR education concept in teaching about healthy food*** Project aim: To address the challenge of obesity among the students population by educating them how to recognize advantages of healthy food for their wellbeing.
Performer of the activity	- People/students willing to download the app and participate in the activities - Schools using the app as a way of teaching students and eco-friendlier way of living - NGOs, public authorities and companies that wish to implement or collaborate with this project - IT company to develop the app
Expected results	- health promotion in children - use of VR-based ICT technologies in education - adoption of new educational approaches - Student-centered learning
Period of performance	2023-2027
Human resources	- App developers - Experts on topics health and nutrition - Policy experts from different key stakeholders groups: public authorities, NGOs, and educational sector - Communication and dissemination experts
Budget:	EUR 250,000
Financial sources:	Erasmus+ Programme Other potential EU programs from the current programming period 2021 – 2027

Activity 5:

Description of the activity	***Use of VR technology in vocational schools for tourism*** The general goal of the project is to use VR technology to improve the knowledge and competencies of students in vocational tourism schools in order to more easily adopt the curriculum and educational lessons and help students that during practicum use VR technology.

Performer of the activity	- People/students willing to download the app and participate in the activities - Vocational schools using the app as a way of teaching students and eco-friendlier way of living - NGOs, public authorities and companies that wish to implement or collaborate with this project - IT company to develop the app
Expected results	- use of VR-based ICT technologies in vocational education - adoption of new educational approaches - Student-centered learning
Period of performance	2023-2027
Human resources	- App developers - Experts on topic of tourism - Policy experts from different key stakeholders groups: public authorities, NGOs, and educational sector - Communication and dissemination experts
Budget:	EUR 100,00 – 150,000
Financial sources:	Erasmus+ Programme Other potential EU programs from the current programming period 2021 – 2027

Activity 6:

Description of the activity	***Project VULNERABLE VR*** Using of VR environment for social inclusion of vulnerable groups The project goal is to create 360 degrees VR videos with educative contents which will show negative and positive situations that people with disadvantages are facing. The videos will be used as educative approach for tackling of discrimination racism bulling etc. for the students on the age of 12 – 13 years old
Performer of the activity	Teachers and students on the age of 12th – 13th years old. Experts from NGOs for creation of the educative contents (scenarios)
Expected results	Increased awareness for necessity for promotion of inclusion of vulnerable groups in educational institutions and generally in the society. Tackling of existing cases of racism (towards ethnic minorities like Roma for example), cased of discrimination, bullying (physical and online)
Period of performance	2024 - 2027
Human resources	- Experts on topic of social inclusion - Experts in creation of awareness campaigns - Communication experts (for approaching different stakeholders groups)
Budget:	EUR 120.000
Financial sources:	Erasmus+ Program

Activity 7:

Description of the activity	***Introduction of ITC based methods in school subjects by using of holograms.*** The main goal of the project will be increasing interest of students within school classes and supporting the students with academic

	under achievements. The goal is planned to be achieved by development of educational concept based on the holograms technology for students in the early age of education.
Performer of the activity	Teachers and Children in primary schools on the age of 8 - 10 years old (focus on the children with academic under achievements) Experts from NGOs for creation of the educative contents (scenarios)
Expected results	Increased interest of the school subjects and improved achievements of the students with underachievement
Period of performance	2024 - 2027
Human resources	- Experts for development holograms software - Experts in trainings for teachers for creating contents for different school subjects that can be used for hologram software - Communication experts (for approaching different stakeholders groups)
Budget:	EUR 250.000
Financial sources:	Erasmus+ Program

Activity 8:

Description of the activity	***Introduction of the Green entrepreneurship concept for high school students*** Enable teachers to acquire additional skills for working with students, training on new learning methods related to entrepreneurship potential of the climate change challenge and transition to the Green Economy.
Performer of the activity	Teachers and high school students Experts from NGOs for creation of the trainings for green entrepreneurship and creating new learning methods
Expected results	Secondary school teachers are trained in recognizing of the potential of the transition towards Green economy and there is a developed educational method for introduction of Green Entrepreneurship in school classes based on the Creative thinking as a problem solving method
Period of performance	2024 - 2027
Human resources	- Experts entrepreneurship - Communication experts (for approaching different stakeholders groups)
Budget:	EUR 120.000
Financial sources:	Erasmus+ Program

Activity 9:

Description of the activity	***Project „Light Pollution“*** Light pollution today is a global problem, which is attributed to economic, astronomical, safety and health issues that affect humans and cause numerous adverse health effects. All beings are dependent on natural body cycles called circadian rhythms and the production of melatonin, which are regulated by light and dark (e.g., day and night). We all live in areas where these rhythms have

	been disrupted because we are exposed to light all the time. While sleeping, melatonin production can be suppressed, which can lead to sleep disorders and other health problems such as increased headaches, worker fatigue, medically defined stress, some forms of obesity due to lack of sleep and increased anxiety.
Performer of the activity	Teachers and high school students Experts from NGOs for creation of the trainings for green entrepreneurship and creating new learning methods
Expected results	- sharing new knowledge and skills among teachers and students - cooperation with international partners, establishing strong ties for future cooperation - brochure on project activities and best practices including multilanguage glossary that can be used by other schools - produced solutions against light pollution by students from VET schools
Period of performance	2024 - 2026
Human resources	- App and web developers; - Experts on topics like environment protection, - Communication and dissemination experts; - Teachers educating students through the app.
Budget:	EUR 150.000
Financial sources:	Erasmus+ Program

Activity 10:

Description of the activity	***Project Digi EDU*** Main idea of the project is to create innovative pedagogical and teaching methods which will be based on digital technologies. The aim of our idea is to learn and encourage educators/teachers and students to collaborate and use technology in a creative and effective way. In present education systems in most of the EU countries, it is becoming very challenging for teachers to motivate students to learn the material presented in the classroom. Surveys made in the project partners secondary schools, in the phase of project idea development, just prove the well-known fact that students easily "get bored" by the academic content presented in formal education process. Traditional teaching methods are focused on providing facts; however, having access to and consuming a lot of information isn't learning. Being informed isn't the same as being educated. Virtual Reality (VR) can motivate students towards academic achievement. By using of VR technology, teachers can attract the attention of students to developed VR education material and make studying process exciting and more effective. VR is on the doorstep of education, and without a doubt, it'll change the world as we know it. New school classrooms will be technologically advanced places of learning, with VR technology, that will allow significantly increasing of students' engagement and learning.
Performer of the activity	Teachers and high school students Experts from NGOs for creation of the trainings for green entrepreneurship and creating new learning methods
Expected results	Main idea behind innovative VR education module „Digital

	Mathematics Education Application“ is to create 5 different modules that will demonstrate the beauty of mathematics through interesting VR puzzles. Project partner teachers will participate in creating concepts of each puzzle. All 5 tasks will be placed in one virtual room and it will not be possible to move to the next one until the prior one is solved. Increased interest of the school subjects and improved achievements of the students with underachievement
Period of performance	2024 - 2026
Human resources	- App and web developers; - Communication and dissemination experts; - Teachers educating students through the app.
Budget:	EUR 130.000
Financial sources:	Erasmus+ Program