



This project has received funding from the EU
Erasmus+ Programme under grant agreement 2021-
1-EL02-KA220-YOU-000028780



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

BRIDGING THE — GAP

An AI-enabled versatile skill matching
tool to assist the less privileged

BRIDGING THE GAP DELIVERABLE 1.1

Authors:	International Hellenic University [IHU]
Status:	Final
Due Date:	31/12/2022
Version:	1.0
Dissemination Level:	PU

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BRIDGING THE GAP Project Profile

Grant Agreement No.: 2021-1-EL02-KA220-YOU-000028780

Acronym:	BRIDGING THE GAP
Title:	Overview of problem area and state-of-the-art
URL:	https://bridgingthegaproject.eu/
Start Date:	14/02/2022
Duration:	24 months

Partners

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	UNIVERSITATEA DIN CRAIOVA	Romania
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Document History

Version	Date	Author (Partner)	Remarks/Changes
0.1	07/12/2022	Kalliopi Kravari (IHU)	Table of Contents
0.2	12/12/2022	Chenyang Ji (IHU), Athanasios Kravaris (IHU), Dimitrios Sarafis (My Company Projects O.E.)	1 st Draft ready for internal review
0.3	27/12/2022	Kalliopi Kravari (IHU)	2 nd Draft ready for quality control
1.0	31/12/2022	Periklis Chatzimisios (IHU)	FINAL VERSION TO BE SUBMITTED

Abbreviations and acronyms

Deliverable	D
Expected Outcomes	EO
International Hellenic University	IHU
Non-governmental organization	NGO
Labour Force Survey	LFS
Neither in employment nor in education or training	NEET
Human Resources	HR

Executive Summary

BRIDGING THE GAP is a 24 month duration project funding from the European Union's Erasmus+: KA220-YOU under Grant Agreement 2021-1-EL02-KA220-YOU-000028780.

The overarching objective of the BRIDGING THE GAP project is to provide a holistic approach beyond a classical skill-matching system to a system that will bridge the gap as to who are the underprivileged and why are they underprivileged and how education and skill improvement will benefit them.

The main purpose of this document is to report the progress of the BRIDGING THE GAP project during the Deliverable 1.1. More specifically, this deliverable reports on Project Results 1 first findings that abridge the problem area and identify the semantic and artificial intelligence gaps in the job and educational markets while provide a solution area where the consortium research for the resolution to the problem identified. The current document analyses the problem area of bridging the job and educational markets, especially in relevance with the issues that face underprivileged young people. It identifies a solution area including use cases, technologies to be utilised and standards to be exploited and even enhanced. Available and relevant to semantic web technologies open source tools were also investigated.

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1 Introduction

1.1 Purpose of the document

The purpose of this document is to present the progress of the project during the first implementation phase regarding the implemented research activities as they are reported in Project Results 1 (deliverable 1.1).

1.2 Intended audience

The intended audience of this document consists of the following target groups:

- BRIDGING THE GAP project partners and the Project Officer at the National Agency
- Young people, especially on the Balkan area, that are interested in skill building/matching
- Labour market actors
- Universities, course providers

1.3 Work Package Objective

The current Deliverable 1.1, part of Project Results 1, analyses the problem area of bridging the job and educational markets, especially in relevance with the issues that face underprivileged young people. It identifies a solution area including use cases, technologies to be utilised and standards to be exploited and even enhanced as well as available relevant to semantic web technologies open source tools.

1.4 Structure of the document

In Chapter 2, this report describes statistics of unemployment and how the Bridging The Gap project intends to contribute.

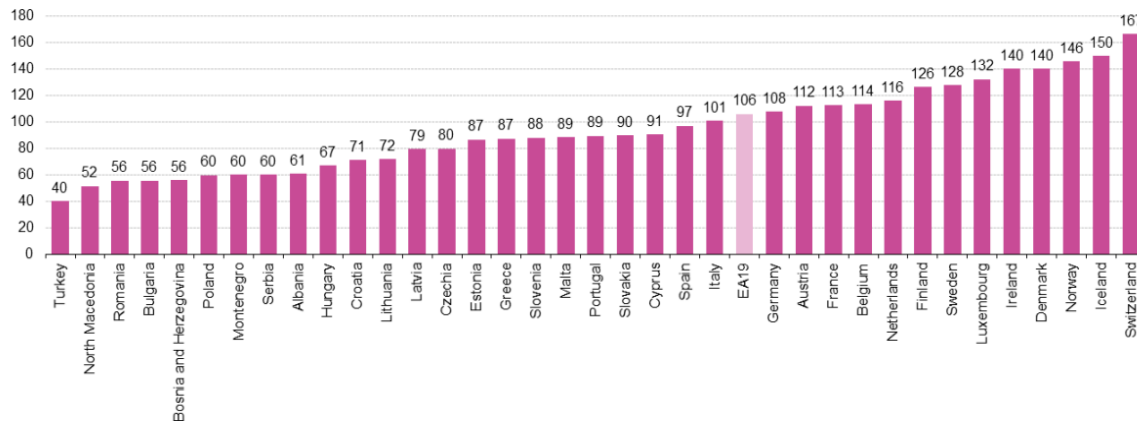
In Chapter 3, this report presents discusses research and methodology issues, presenting part of the online tools that were studied and evaluated in the context of the project implementation

Chapter 4 concludes the findings of the current report.

2 Unemployment & Bridging The Gap

Europe is a continent and also a union of countries geologically located in this continent including the project participating countries Greece, Bulgaria, and Romania. The cost of living can differ a lot among countries in Europe according to Eurostat. In particular, in Greece the price level is average, whereas in Romania and Bulgaria, the price level was 44 % below the EU average, meaning that with a decent income, it seems easier for someone to live in these countries.

Price level index for final household consumption expenditure (HFCE) 2021, (EU=100)



Source: Eurostat (online data code: prcippiind)

eurostat

Figure 1: Price level index for final household consumption expenditure (HFCE) 2021, (EU=100)

Source: Eurostat.

Yet, digitalisation is having a massive impact on the labour market and the type of skills needed in the economy and society. Techniques such as the Factories of the Future (Industry 4.0), Internet of Things (IoT) measurement and control systems and related management/operation and data fusion procedures are becoming widely spread all over Europe. Thus, digital skills are of critical value for working, learning and social interaction. The COVID-19 pandemic has accentuated the digital skills gap that had already existed and new inequalities are emerging as many people still do not have the required level of digital skills or are in workplaces or schools lagging behind in digitalisation (Sustainable development in the EU, Monitoring report on progress towards the SDGs in an EU context, 2021 edition EUROSTAT). Hence, the COVID-19 pandemic underscores the need to protect people's employability in times of crisis, especially the less privileged. In addition to the loss of life and income, the pandemic poses risks to young people education and work opportunities.

In this context, underprivileged can be termed as disadvantaged students/unemployed/low-paid/socially excluded (young) people who constitute a major part and they are under privileged and undeveloped from every angle in society. Broadly speaking, the class of underprivileged is underprivileged due to lack of education which can make them, among others, social. Although the project will be used by all EU citizens, it will be slightly focused on the implementation phase on the Balkan, an area that deals with great challenges especially for the youth. The aim is to give the opportunity to less privileged young people to seek a job within EU and improve their skills, by providing the available tools stemming by the action to better describe with specific, known and agreed semantics

his/her skills and qualifications. On the other hand, EU companies will be supported in describing occupations and specific jobs under an agreed semantic context. Finally, EU educational institutions (and even companies offering on-the-job training) are to adapt their courses and learning outcomes to EU job and citizens requirements.

2.1 Unemployment

Unemployment is a topic of concern for many countries and a high rate of unemployment indicates that a specific economy is not healthy. The higher the unemployment, the larger the risk of public security deterioration. Our project aims at scaffolding bridging this identified gap and offering an economical, yet a realizable solution for our stakeholders that are, for example, citizens, companies, educational organisations. However, there is evidence that factors other than skill deficits are mostly responsible for rising unemployment coexisting with difficult-to-fill job vacancies. With imperfect job markets, it is inevitable that all economies have some imbalance between the supply of and demand for different skills. At this point, our aim is to alleviate this imbalance by introducing an intelligent recommendation and forecast engine for courses to cover the skills required by the job market.

According to Eurostat, for the past few years, the unemployment rate in Europe has a decreasing approach, the number of people that were unemployed in October 2022 compared with October 2021 has been decreased by 1.158 million in the EU and by 1.053 million in the euro area. The EU unemployment rate was 6.0 % in October 2022, down from 6.1 % in September 2022 and down from 6.6 % in October 2021.

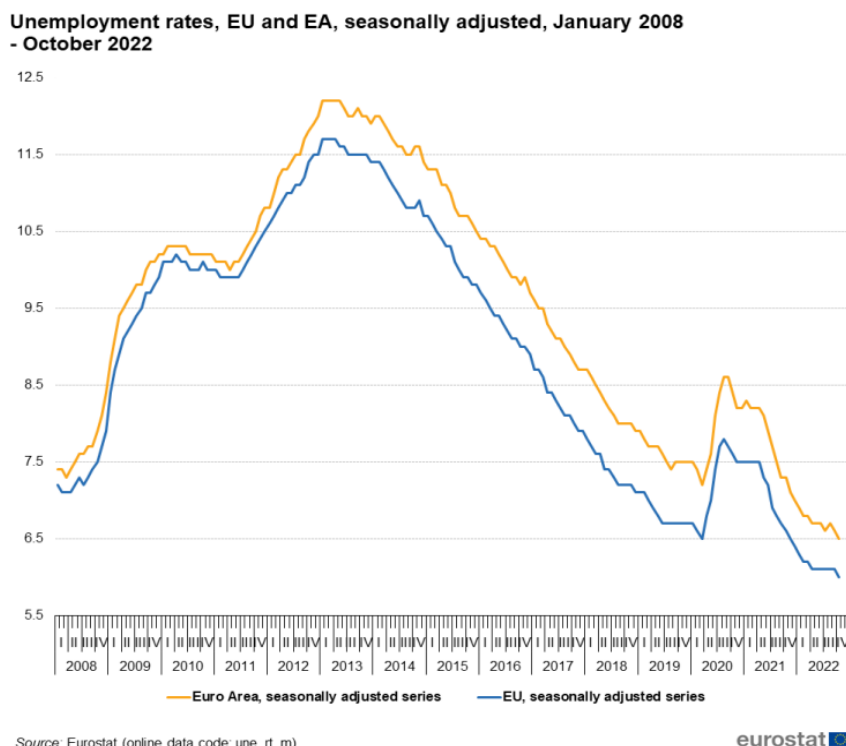


Figure 2: Unemployment rates, EU and EA, seasonally adjusted, January 2008 - October 2022 (%)

Source: Eurostat

As far as it concerns the participating countries, in Greece, the unemployment rate in June 2022 fell down to 12.1% compared to 12.5% in the previous months according to Eurostat. But still, the number of unemployed people reaches 572.1 thousands. For Bulgaria, the unemployment rate reached 4% in October 2022 and in Romania, the unemployment rate has reached 6.70% in June 2020 and since then the situation has not been alleviated.

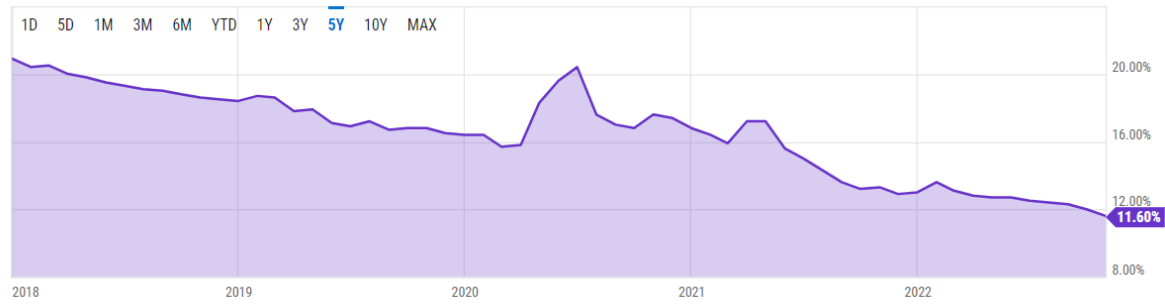


Figure 3: Greece Unemployment Rate from 2018 - 2022, info source: Eurostat

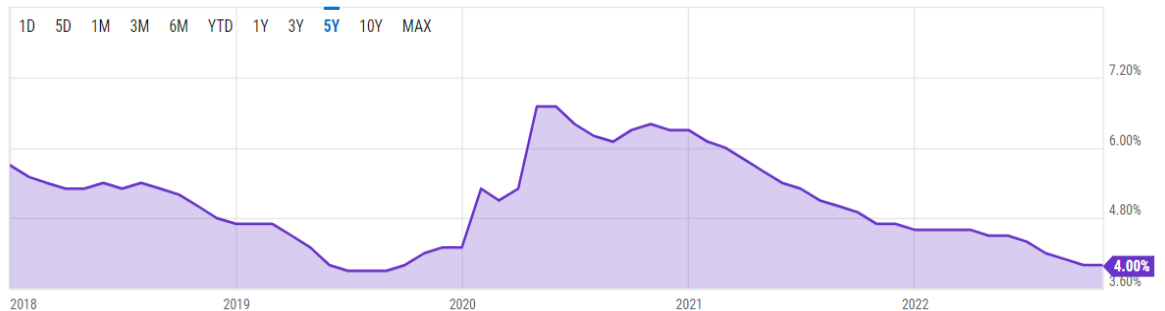


Figure 4: Bulgaria Unemployment Rate from 2018 - 2022, info source: Eurostat

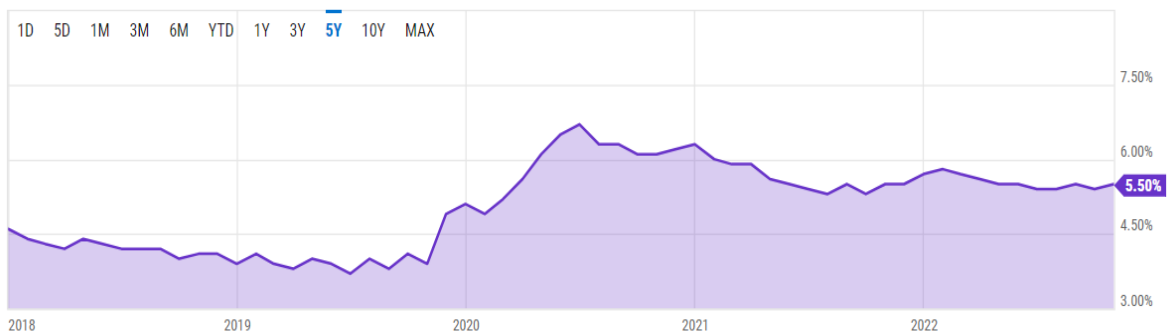
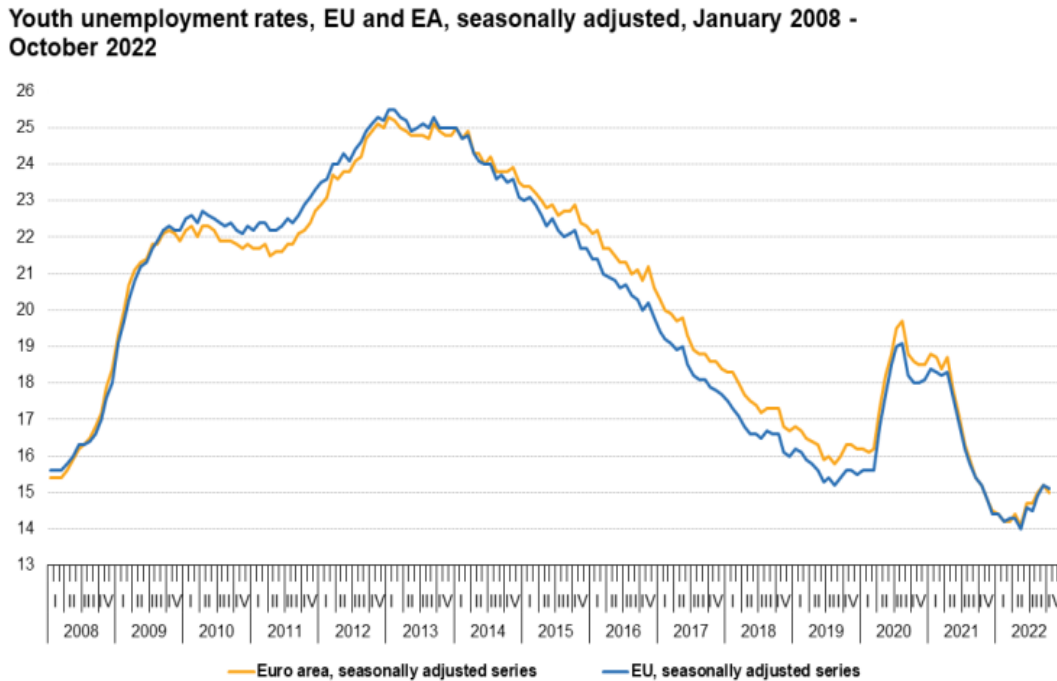


Figure 5: Romania Unemployment Rate from 2018 - 2022, info source: Eurostat

Among unemployed people, many of them are young people (under 25). According to Eurostat, in October 2022, 2.872 million young persons (under 25) were unemployed in the EU, of whom 2.326 million were in the euro area. In October 2022, the youth unemployment rate was 15.1 % in the EU and 15.0 % in the euro area, both down from 15.2 % in the previous month. Compared with October 2021, youth unemployment increased by 102 thousand in the EU and by 81 thousand in the euro area.

As depicted in Figure 6, the unemployment rate for young people is increasing approach since the 2nd quarter of 2022 due to several reasons which seem to last for the next few years. The education status of young people in Europe according to Eurostat, there were 18.0 million tertiary education students in 2020, 60 % of the total consisted of students with bachelor's degrees. In addition to that, more than half of the pupils in the EU have the ability to speak more than one language in order to improve employability.



Source: Eurostat (online data code: une_rt_m)

eurostat

Figure 6: Youth unemployment rates, EU and EA, seasonally adjusted, January 2008 - October 2022 (%) - Source: Eurostat

By providing the aforementioned statistics, we want to emphasize that a large percentage of unemployed young people are recent graduates of tertiary education since only 9,7% of young people are early leavers. Moreover, data from Eurostat reveals that the highest employment rates in 2021 were recorded for those who had graduated with a tertiary education, while lower employment rates were recorded for those with an upper secondary or post-secondary non-tertiary education (i.e. with a medium level of education), indicating that providing educational opportunities to unprivileged communities might be a great solution to unemployment.

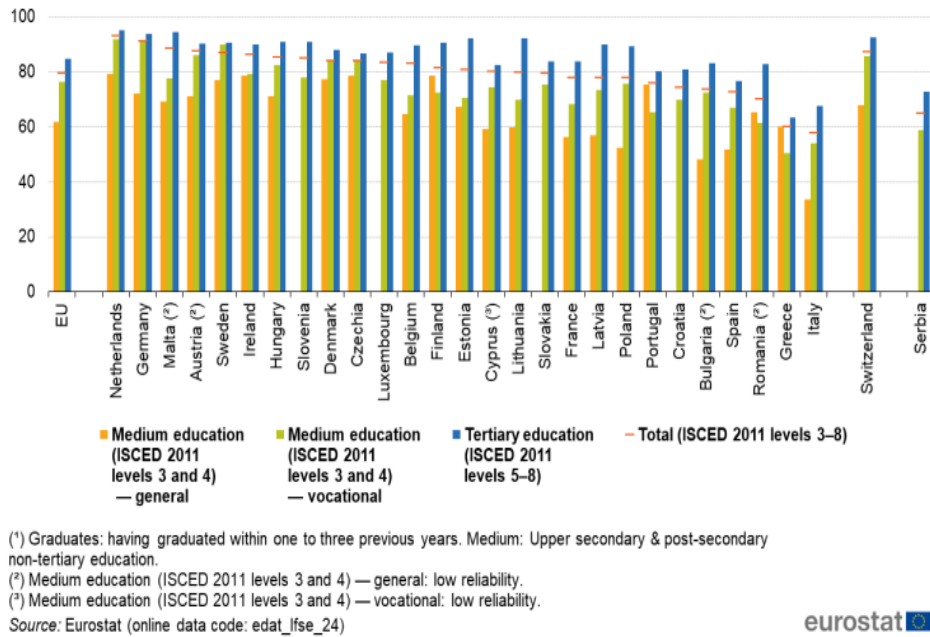


Figure 7: Employment rates of recent graduates (aged 20–34) not in education and training, by level of educational attainment, 2021 - Source: Eurostat

The average proportion of young people neither in employment nor in education and training in the EU is 13.1% in 2021. Gender specified, 11.8% are men and 14.5% are women. Some of the reasons for people to remain under the status of Not in Employment, Education or Training (NEET) is that it takes longer time to become established on the labour market, since jobs nowadays have become more and more difficult to fulfil the requirements, either by the aspects of skill or acknowledgment. For the same reason, it is very common for young people in employment to return to education in order to improve their qualifications.

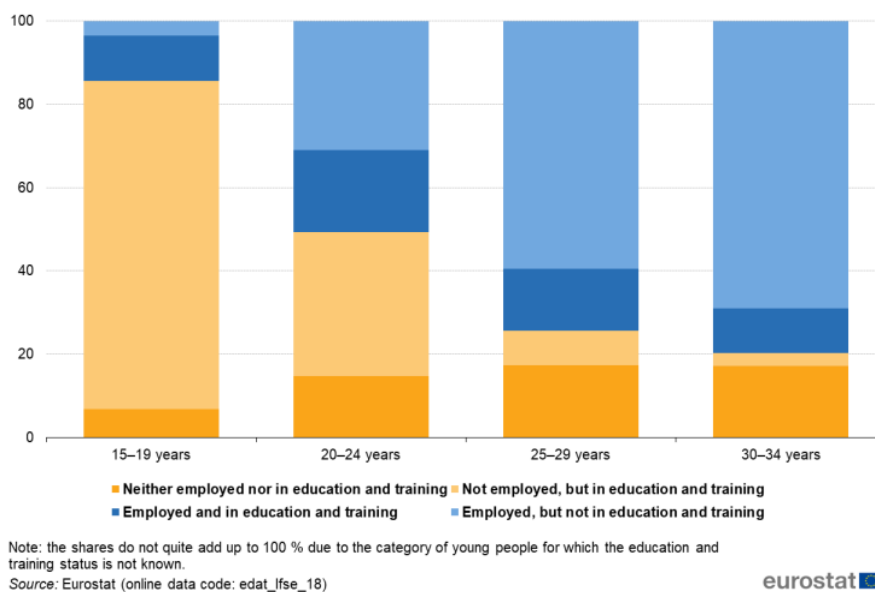


Figure 8: Employment, education and training status of young people, by age, EU, 2021 - Source: Eurostat

For countries in Europe, Figure 9 illustrates the analysis reports per country for these people. The 3 project participating countries, Greece, Bulgaria, and Romania seem to have a higher NEET rate compared to the EU's average. Greece and Bulgaria's data show that this rate has decreased since 2011 but for Romania, it seems that it has increased compared to 2011.

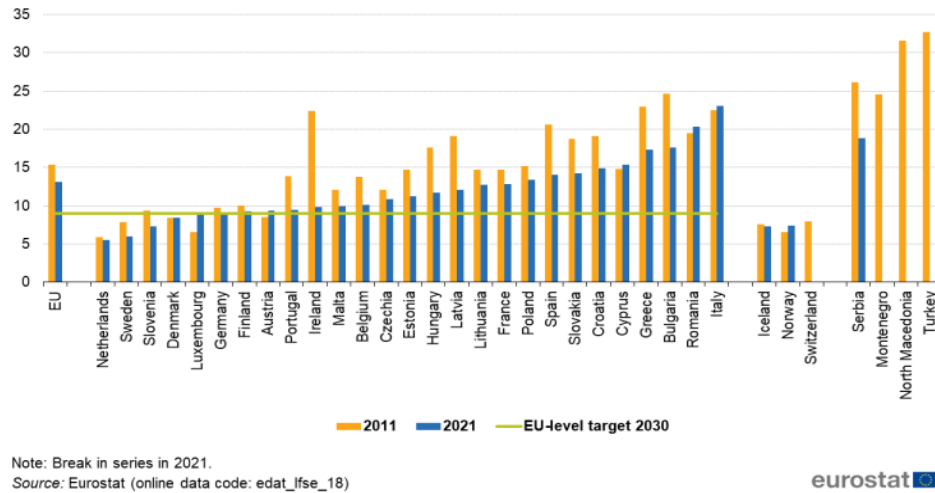


Figure 9: Young people (aged 15-29) neither in employment nor in education and training, 2011 and 2021 - Source: Eurostat

As depicted in Figure 10, concerning people aged 15–29 with tertiary education, their NEET rates were in general considerably lower than for the other levels of education. The lowest share was 3.1 % in the Netherlands but a value as high as 26.8 % was reported in Greece. The situation in Romania and Bulgaria seems to differ from Greece, with the highest proportion of NEET people with a low level of education and then with a middle level of education.

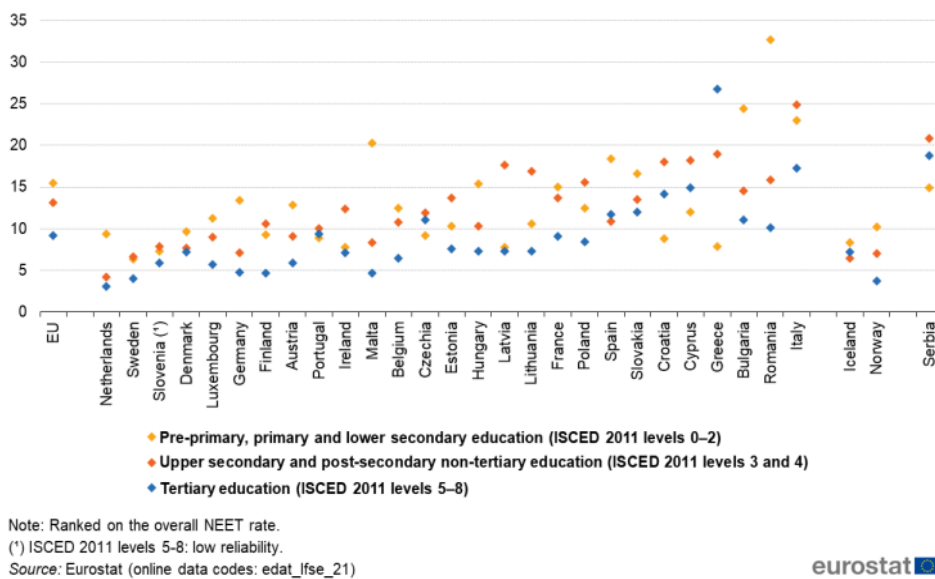


Figure 10: Young people (aged 15–29) neither in employment nor in education and training, by educational attainment level, 2021 - Source: Eurostat

Our efforts aim to ensure a smooth transition from education to the job market, trying to bridge the gap between education and the job market for underprivileged people who lack acknowledgment or experience of the current job market requirements and have limited information sources. Giving example, newly graduated students and full-time mothers could be our target group. The reason why we consider people with limited information sources as underprivileged people is that the job market is continuously evolving, leading to new specific requirements based on certain job categories. Nowadays, in most cases, people cannot fulfil the requirements of their target job when they just got their bachelor's degree and don't take additional courses for skills or certificates.

The final result of this research is to create a comprehensive platform that would be easily accessible for our targeted groups and it will provide the essential knowledge and services to help them obtaining the required skills to adjust to the current job market.

2.2 (Less privileged) Intendent Participants

To start with, we must emphasize that, especially for technology-related professions but not only, the labour market is rapidly evolving, even a technology that was in demand just a few years ago might now be outdated. The problem is that the content of education people receive from organizations has not changed as it should, leading to the content of education that includes outdated skills or pieces of information [3]. Hence, people after receiving education from organizations must undergo a long way to find that additional education/training is required for job hunting. Based on experiences and field research done [4] [5], the challenges people may face when hunting for a job may include:

1. **Time pressure:** in order to cover daily expenses or due to lack of experience, some students were unable to be fully prepared for the job hunting process and cannot find jobs in their area of study and has to accept an offer within a less skilled area or has non-offer at all which leads him/her to be a NEET after graduation. Moreover, the difficulty to find a job increases as the time of unemployment increases.
2. **Weak social networks:** several studies have focused on the impact of networking during a job search and a large number of job seekers have found jobs through this method. According to Franzen & Hangartner (2006), the lower percentage of respondents finding jobs through networking is 26% in Finland and Austria. Both strong and weak ties, since both of them, can provide a new source of information. Especially strong ties could produce more job offers.
3. **Weak public presence:** people with no job hunting experience or have left the labour market for a long time tend to have a weak public presence, meaning that they do not have sources to promote themselves. For example, a great tool for self-promotion is a LinkedIn profile, publications, etc. Besides that, weak public presence also could mean that they do not have experiences that could boost their CVs in order to get the opportunity for job interviews.
4. **Interview behaviour:** it is difficult to stay calm and self-promote when people are under pressure, especially in cases with little experience. These pressures will mount through time and will result in other unpleasant circumstances.
5. **Searching guidance:** the number of data people can get from platforms for job hunting is countless, with different descriptions, requirements and etc., even for the same job position. It is difficult for somebody to distinguish between that amount of information which are helpful and which are not.

6. Competition: when the job market is growing, the number of open positions is more than the number of people seeking jobs. However, the last few years have not been constructing for the economy for many reasons, the most important of them being the covid pandemic which seems to last for longer.

As discussed in [6], it is very common for people to face discouraging circumstances while seeking jobs. These circumstances have negative effects that impact people's lives and there is plenty of research trying to find the solution to these negative effects. Giving as examples:

- No chance for an interview or many interviews but no offer
- Frustration about employer's expectation
- Lack of knowledge or skill to fulfil certain requirements
- Companies prefer internal referrals
- Psychological pressure from the environment for being NEET
- Lack of progress

Thus, our research aims to solve some of the challenges mentioned before, especially for underprivileged people. Describing, the characteristics of the intended audience of our research are:

- Lack of source information
- Lack of financial support
- Lack of opportunities for self-development
- Little experience with the current labour market
- Little experience with existing web platforms

Giving as examples, group of people like recently graduated student, housewives, people seeking a second job after dismiss, etc.

3 Research & Methodology

In our research, we provide a description of the current education market and the labour market by analysing existing online platforms including the official school pages, online courses, job hunting platforms, official company pages, etc. More particularly, we are trying to bridge the gap between the educational market and the labour market. A lot of research has been conducted in the past for the specific content [1] and a large of ongoing research is about the specific topic. A lot of ongoing research tends to use new technological tools such as Artificial Intelligent (AI), machine learning, big data analysis to solve the problem [2].

In this project, we will start with a description of the problem, analysing the existing state of the art including the tools used today in the educational and labour market. Based on which tools can achieve the project's targets, we will conduct a comparison between similar existing platforms discussing specific advantages and disadvantages of each choice based on certain criteria. We will then present the results of our work, which is a web platform with open access to the public, providing services like CV boosting and course recommendation based on what user needs and wants to achieve. Finally, we will present some ideas for future implementation and improvement of the platform.

3.1 Research aim

As mentioned beforehand, the aim of our research is to bridge the gap between education and the labour market. To start with, Internet is a great tool that has been used for both, there are many web platforms providing educational services and services for job hunting. We will analyse the existing web platforms for education and the labour market and try to explain what the gap we mentioned so many times is.

Starting with educational web platforms [7] [8], these platforms utilize a variety of multimedia technologies such as videos, live streaming, PowerPoint files, etc. to support either communication or to deliver learning content in a distance. Moreover, based on the content of the platform, they can be categorized into different groups, we will analyse these categories in the next section. Starting with the pros and cons of these online educational platforms. The first advantage of e-learning is the accessibility that is being offered to the public. Research has shown that e-learning is an economic tool for people to improve the quality of learning and teaching (Songkram, 2015). Giving as an example university education, for in-person learning, the student must arrange their lives around school which means they should spend extra budget for moving and rent. Moreover, sometimes in-person learning can cost a lot of money and there is no guarantee when privately hiring somebody for learning, since students are always new to the subject, they cannot assess if the content provided to them is correct or not. On the other hand, e-learning platforms usually provide public content accessible to everyone or at least everyone in the specific class, having a number of people checking on their provided content. In addition to that, the e-learning platform provides programs at every level to suit everybody's needs.

The second major advantage is flexibility, meaning people can take their classes anywhere and anytime. Moreover, since it uses a lot of different technological tools to provide the content, it does not require the class to be in real-time communication, people can learn at their own pace. In on-campus classes, they have a specific time and place for classes and assignments, and when somebody falls behind or misses a few of them, it is very hard to catch up. Some of the tools that e-learning platforms provide to empower flexibility are lecture videos with slow or rewind options, exam simulations that students

can attempt more than once, etc. But nothing is perfect and these platforms also have their disadvantages. First of all, since the content of learning is provided online only, there is no place for students to interact with others, either students or teachers, meaning fewer networking opportunities and that might affect the transition to the labour market. Besides that, lacking opportunities for communication might affect the motivation of students since people receive less feedback. Another issue of e-learning is that it requires self-discipline. People have the cosiness to study from their homes but they also receive distractions from various sources, especially for classes with no specific class time and due times, they must motivate themselves to set a schedule and complete assignments.

Similar to e-learning platforms, e-recruitment platforms also have their advantages and disadvantages [9] [10]. By using the term "e-recruitment", we refer to the implementation of the recruitment process using web-based tools. For the content of e-recruitment platforms, we will discuss it in the next section. The major advantage of e-recruitment is the convenience provided to the employer and candidates. Before the internet, HR managers must publish vacancies by word of mouth or use local newspapers to inform job seekers, nowadays they can just post the information on well-known platforms, which cost less than 20 minutes, and wait for candidates from a larger pool. It allows immediate real-time communication if needed and online delivery of specific documents such as CVs and official paperwork. Moreover, employers can save up to 90% of hiring costs since no advertisement is needed. Employees get the benefit of wider scope using e-recruitment platforms. E-recruitment also has its disadvantages. For instance, the abundance of applicants we mentioned before allowing employers to select candidates from a larger pool, but since the internet is an open tool for people nowadays, employers might receive a large number of interested candidates, which many of them are unqualified for the posted job vacancy. As a result, employers must spend a great deal of time sorting and selecting from the received resumes.

3.2 Methodology framework

A large number of the conducted research [11] [12] [13] over the world is on this specific topic, focusing on the reason and responsibility of the different parties involved in the process. Based on the method used in previous research works, we designed our own assessment tool. The first step in analysing the problem area is to understand the challenges people face when searching for a job. In most cases, the procedure to apply for a job is as follows:

- 1 Find a detailed description of the specific position (either online or offline)
- 2 Create a appropriate CV trying to match the required skills or experience
- 3 Search for companies recruiting
- 4 Find their application procedure
- 5 Wait for an answer

Another common step after an application is a live interview. The questions they might face during this procedure are:

- Where to find a valid job description
- How to value the skills required
- Where to find companies recruiting
- How to properly promote themselves in a plain CV

In order to answer these questions, we have to gather information about the existing platforms which provides educational and job market-related services. We divided the platforms into 2 categories, educational and the job market. For each category, we use different factors for assessment.

For educational platform assessment, the factors used are:

- Content
- Accessibility
- Requirement
- User experience
- Cost

The content of an educational platform is the type of resources being provided to the users. Some of the platforms provide more than 1 type of resource. We defined the types of the resources as follows:

- Studying material where files describing a specific topic or a specific lesson are provided. An example is opencourse.gr where students must enrol in lessons to obtain the files used in class. Another example is platforms like ocw.mit.edu which provides open access to lecture videos or notes.
- Diploma program, in this type there are 2 different descriptions. One is an information center where people can search for university classes open for application. The other is the university's official page where people can search for anything related, including courses or classes open for application.
- Skill certificate, still this type has 2 different descriptions. One is sites from technology companies that provide studying material about a specific skill and provides a chance to undergo examination for a certificate. The other provides courses about specific skills and gives thorough instructions about how to apply for certification.
- The learning platform provides a lesson certificate after fulfilling the requirements of a certain course, which usually is either completing an exam or reaching certain criteria such as browsing time. These certificates are barely considered useful evidence by the job market.

Educational platforms aim to provide resources in an easily accessible way, so accessibility is an important factor to assess its value. We use different criteria as follows:

- If the specific platform is available in search engines and if yes, which is its priority. The most popular search engines in Europe are Google and Bing. By priority, we measure its place in the search results using keywords "courses", "online learning" and "online lessons".
- Most platforms provide a different set of services for registered users. The functionality of the basic service set, including search and browsing, will affect the final choice of users. The functionality of services provided to registered users affects the user experience.
- By paying services, we refer to manual services like homework examination, Q&A, etc. provided by the platform.
- Related to the previous point about providing different services to registered users, we must value how much effort someone should spend for registration. At this point, we just categorize the difficulty according to the resources needed for registration.
- Places seen are the last important factor to value accessibility. Since our target group is underprivileged people, we acknowledge that they have limited sources of information. We created a list of some of the common places our target group visits, such as school announcement boards and advertisements.

The third factor we use is "requirement" and it refers to the user background, precisely the existing learning background. We categorized the application requirement for different courses among platforms and we level the difficulty according to the number of conditions that should be fulfilled in order to be able to apply.

Another factor used for assessment is "user experience", which refers to how smoothly a new user adjusts to its services and if proper help exists. We value user experience by answering the following questions:

- If communication with the platform is available and the response time
- If the services provided by the platform are enough
- If the description of the courses is valid and clear
- Does the labour market accept the certificates provided by the platform
- If the platform provides different methods of application
- If guidance to new users exists

The last factor is if there is any cost to use the platform's services.

For labour market platform, we use almost the same factors for assessment.

- Content
- Accessibility
- Requirement
- User experience
- Cost

The content of a labour market platform depends on the services available. We created a list as follows:

- Job searching
- CV templates
- Career coaching by providing advice on cv writing or career path
- Local information with advice on how to live in a specific country
- Community services where users can provide pieces of information that might be helpful to others
- Company information such as description, number of workers, hiring rate, or comments
- Tutorials or guides on job hunting
- Social network

The only difference is in the factor 'user experience' where instead of the certificate acceptance, we value if the information posted by companies is valid and trustworthy.

What we are concerned about these platforms is the paying services part. As we mentioned before, different platforms issue certificates with different levels of acceptance to the labour market, while having costs at the same level. One feature of our target group is the lack of experience in job hunting, which means they don't know how to properly choose between different platforms and various courses for their purpose. Especially for job market platforms, about paying services like CV boosting or interview simulations, due to the lack of experience, our target group might not be able to distinguish if the service provided is worth its value.

Part of the aforementioned research is presented in the table below:

Site	Type	Content	Area	Certificate	Duration	Cost	Job relevant info	Language	Accessibility	Requirement
opencourses.gr	Education	Study materials		No	No specific	free	No	En / Gr		High
https://www.eduguide.gr/	Education	Diploma programmes		Yes	Specific	Based	News / Advice	GR		High
https://www.coursea.org/	Education	Skill certificates / Diploma programmes		Yes	Specific	Based	Career advice	En		Medium low - High
https://www.udemy.com/	Education	Lesson certificate		Yes(?)	No specific	Based	No	En		Medium low - High
http://www.csae.edu.gr/	Education	Skill certificates / Adult education		Yes	Specific	(?)	No	GR		Low
https://online.stanford.edu/	Education	Diploma programmes		Yes	Specific	Based	No	En		Medium low - High
https://ocw.mit.edu/	Education	Study materials		No	No specific	Free	No	En		High
https://ocw.vale.edu/	Education	Study materials		No	No specific	Free	No	En		High
https://www.edx.org/	Education	Skill certificates / Diploma programmes		Yes	Specific	Based	No	En		Medium low - High
https://docs.microsoft.com/zh-cn/learn/	Education	Skill certificate		Yes	No	Based	No	En		Medium high - High
https://www.linkedin.com/learning	Education	Lesson certificate		Yes(?)	No	Based	No	En		Medium high - High
online?source=AdW-	Education	Diploma programmes		Yes	Specific	Based	No	En		Medium high - High
https://elearning.upit.ro/	Education	Diploma programmes		Yes	Specific	Based	No	Ro		Medium high - High
https://www.link-academy.com/	Education	Skill certificates / Diploma programmes		Yes	Specific	Based	Career advice	Ro		Medium high - High
https://www.telacad.ro/	Education	Skill certificates		Yes	Specific	Based	Career advice	Ro		Medium - High
https://scoalainformala.ro/	Education	Skill certificates		Yes	Specific	Based	Career advice	Ro		Medium
https://scoalainformala.ro/	Education	Lesson certificate		Yes	Specific	Based	Career advice	RO		Low
https://imoc.ro	Education	Study materials		No	No specific	Free	No	RO		Low
https://andrei.kubisco.ro	Education	Study materials		No	No specific	Free	No	RO		Medium low - High
https://anis.ro	Education	Skill certificates		Yes	Specific	Based	Career advice	RO		Low
https://www.dschool.ro	Education	Lesson certificate		Yes	Specific	Based	Career advice	RO		Low
https://codecool.com/ro/	Education	Skill certificates		Yes	Specific	Based	Career advice	RO/EN/DE/PL/HU		Low
https://unicampus.ro/	Education	Study materials		No	No specific	Free	No	RO		Medium high - High
https://wellcode.ro	Education	Skill certificates		Yes	Specific	Free/Based	News/Advice	RO		Low
https://wellcode.com	Education	Skill certificates		Yes	Specific	Free/Based	News/Advice	EN		Low
https://www.udacity.com	Education	Skill certificates		No	Specific	Based	Career advice	EN		Medium low - High
https://www.freerofecamo.ro	Education	Skill certificates		Yes	No specific	Free	No	EN		Low

Site	Type	Content	Accessibility	User experienc	Region covered	Language	Scale(user number)
https://www.linkedin.com/	Web platform	1 - 5 - 6 - 7 - 9			Worldwide	En	
https://www.glassdoor.com/	Web platform	1 - 2 - 4 - 5 - 7			Worldwide	En	
https://ec.europa.eu/eures	Web platform	1 - 3 - 5			Europe	En	
https://www.monster.com/	Web platform	1 - 2 - 3 - 5 - 8			Limited countries	Multiple	
https://euraxess.ec.europa.eu/	Web platform	1 - 2 - 3			Worldwide	En	
https://eurojobs.com/	Web platform	1 - 5			worldwide	En	
https://aquent.com/	Staffing agency					En	

Other site
<https://www.jobrank.org/> search job market website per country

Figure 11: Online open tools and platforms

while abbreviations stand for:

Requirement	Degree certifi	Specific skill	Language	Time of completion	Application need	Time limit
Low	No	No	No			
Medium low	No	No	Yes			
Medium high	No	Yes	Yes			
High	Yes	Yes	Yes			

Job market content	service provided				Challenge	
	1 Job searching					Acceptance of website certificates
	2 career coaching	interview simulator career path				Job description uploaded from company
	3 local information	Living advices				lack of proper guidance
	4 community					
	5 cv templates	cv boosting				
	6 networking			Functions		
	7 company info	company hiring rate			1 Searching	
	8 Guide(job finding)				2 Favorites	
	9 social network				3 Recommend	
					4 Category	
					5 Help	Frequent Q & A
					6 history	
Education content	service provided					
	1 Studying material					
	2 Diploma programmes					
	3 Skill certificates					
	4 Lesson certificate					
places seen					Communication	
	1 advertisement	online	offline			1 live chat
	2 notice board	school	gov office			2 email
	3 web tutorial					3 call
	4 friend & relatives					4 office

4 Conclusions and recommendations

In this study, we focus on South-Eastern Europe (Balkan area), that has underprivileged young people beyond the EU average. Of course, there are a lot of immigrants in countries like Greece. Next the targeted scientific breakthrough to be achieved by the proposed project is three-fold. Firstly, we focus on the EU citizen seeking a job within EU, who should have the available tools to better describe with specific, known and agreed semantics his/her skills and qualifications. Secondly, EU companies should be supported in describing occupations and specific jobs under an agreed (semantic) context. Thirdly, EU educational institutions (and even companies offering on-the-job training) are to adapt their courses and learning outcomes to EU job and citizens requirements. In this context, we found that unemployment is higher among young people and especially among some target groups such women. We next proceeded with thorough research and review of available online open (and not open) tools revealing that there are plenty of options as far as it concerns job and course offers. Yet, innovative skill matching and skill building is requiring to reach greater benefits for the interested (unprivileged) participant. More about this goal will be utilized in the following project deliverables.

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