

A Bibliometric Analysis on Overeducation, Undereducation, and Employability

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Abstract. *Mismatches of education alter the process of employment for graduates and it is a popular topic among scholars due to the fact that issues spurred by them can impact on the well-being of workers and the general equilibrium of the labor market, as the prevailing literature review sums up. The present study focuses on a bibliometric analysis of the current state of knowledge in the field of overeducation, undereducation and employability, aiming to discover the most prominent authors, organizations and countries in the academic literature. Our database was extracted from Web of Science in February 2025 and interpreted with the help of the VOSviewer software by looking at the maps of networks created among the three variables. The results reflect that the literature is rich in scientific papers and that it will continue to flourish in the upcoming years. At the moment, there are few research teams of authors, but the connections between countries and research organizations are high and reveal international interest on the theme. This analysis is important for future topics on the categories of economics of education and labor economics because it shows what has been studied until now and it can be an idea generator for future research.*

Keywords: education, overeducation, undereducation, employability, labor market, VOSviewer, bibliometric analysis.

Introduction

Not only does education play a huge role in the personal and professional development of a person, but it has always been related to economics, having roots in classical theories of human capital, productivity and social well-being, to becoming an interdisciplinary contemporary topic. Education does not represent the four walls in which students go in and out generation by generation, it means much more for our society: skills, competences, qualifications for the labor market, higher chances in life and the list can go on infinitely. This is the vastness of education: it is all around us.

As nothing is merely perfect in this world, education has its own flaws: what happens when there is too much or too little of it and how can people manage the gaps when it comes to their employability in the labor market? These issues can be seen in the rate of unemployment, in the wages and in the overall life satisfaction of graduates. As the fourth sustainable development goal (SDG 4) states, productivity, employability, competitiveness and innovation are influenced by the level of education and training one has (Eurostat, 2023). Early education in childhood is as important as tertiary or adult education and training, because the foundation of general skills is completed during those years so that learning outcomes could ensure equal opportunities for all participants in the learning process.

This scientific article aims to explore and identify the current level of knowledge in the academic literature on the topic of overeducation, undereducation and employability, and the networks between authors, organizations and countries, by the means of quantitative bibliometric research in the VOSviewer software. Our paper is constructed on the introduction to the main concepts found in the literature review, followed by the techniques used in the methodology, and then, the results are explained and discussed, and afterwards concluded in the last part of the paper. The present bibliometric analysis follows four research questions, such as: (1) What subjects were researched before on the topic of overeducation, undereducation and employability in the academic literature? (2) What are the main domains in which the topic of overeducation, undereducation and employability are used? (3) Which authors, countries and institutions contributed the most on the topic so far? (4) What authors are the most cited in relation to countries and institutions?

Literature review

Overeducation

The concept of overeducation can be defined as a surplus of human capital that is most likely to lead to a mismatch in the short-term school-to-work transition between a graduate's expected career prospects and actual market opportunities (Caroleo & Pastore, 2015).

Overeducation is associated with ending up working in an unsuitable job and, therefore, graduates in a survey believe that waiting for the perfect job might be better for their career paths later in life (Meroni & Vera-Toscano, 2017). The same authors suggest that educational quality must be homogeneous for all levels of the system and accompanied by guidance in professional career, such as "national employment agencies", and "job-search trainings", for instance, so as to balance out demand and supply in the labor market (Meroni & Vera-Toscano, 2017). However, a field experiment on fictitious job applications shows that waiting for the most suitable job ends up in longer periods of unemployment, which is not so desirable for employers, as they expect the applicants to have benefitted from former job training combined with a sense of work responsibility, and to master social skills, the ability to learn long-term and the latest technologies required on the job (Baert & Verhaest, 2019).

One study shows that in the European Union, migrant women are more likely to be overeducated than non-migrant women and men, and that the degree of urbanization has nothing in common with the phenomenon of overeducation (Baran, 2024). While it is not necessarily bad to be overeducated, the market disequilibrium occurs mainly when imperfect information on job vacancies interferes with the job - hunting process of candidates, resulting in choosing a job inferior to someone's knowledge (McGuinness & Pouliakas, 2017). Businesses and their sustainable growth play an important role on the labor market in terms of providing diversification and extra opportunities for tertiary graduates who are in search for better paid jobs where they can use the skills they acquired during studies, and both businesses' and institutions' rigidity in doing so contribute to quantitative overeducation (Pana & Fanea-Ivanovici, 2019).

Undereducation

Naturally, undereducation is described as the opposite of overeducation, that is, a situation in which someone has less years of education and skills than required for a specific job.

The disequilibrium in the labor market takes place mainly because of the inequalities in the salaries – while the overeducated earn less money for their under qualified jobs, the

undereducated tend to be paid more than adequate workers with more years of education would normally be (Verhaest & Omey, 2012). A 2020 study about UK and Germany (Wiedner & Schaeffer, 2020) revealed how around 13% from the total of workers in the two countries are undereducated, with Germany having a better organized education system producing fewer under skilled students and with British labor markets which train graduates on-the-job to correct the shortcomings of an imperfect educational system. However, at the European countries level, in 2016 there were between 20% and 50% of employees who worked in a job for which they did not possess the necessary qualifications, another paper discloses (Morgado, Sequeira, Santos, Ferreira-Lopes, & Reis, 2016). In short, since then, undereducation has been affecting labor markets more negatively than overeducation has in the case for European countries.

People with more social standing who have less education and look for job positions similar to those of their parents' are most likely to end up working in professions which require higher level of educations, thus resulting in undereducation – this is called “intergenerational stability” (Bürmann, 2023). With the free movement right in the European Union, migration can be influenced by undereducation as it is positively correlated with the choice of emigration and return to home country, as well, due to graduates who cannot find vacancies in their countries of origin (Wanner, Pecoraro, & Tani, 2021). Nevertheless, no matter the degree of undereducation, immigrants have the possibility of acquiring “the local labor market knowledge” and gaining country-specific skills over the length of their stay in the host country (Cim, Kind, & Kleibrink, 2020).

Employability

Employability is the characteristic of graduates who own a set of skills, knowledge, competences and personal traits that allows them to enter the labor market in desired occupations. As pointed out in the above subchapters, there are two forces, overeducation and undereducation, that may disrupt the process of finding the most suitable job. Over- and under-qualification in the labor market highlight the educational system's inability to answer to the market's needs and, in this way, it creates a difficult insertion for graduates in the workforce (Istrate, Horea-Şerban, & Muntele, 2019). Therefore, it is crucial for educational systems to function on a demand and supply model so as to provide the set of competences that the changing labor market asks for, and to adapt the curriculum accordingly.

Due to a constantly changing labor market, technological advancements and changes in demanded skills, higher education institutions must work together with the business sector, so as to adapt their curriculum to be more creative- and innovation-oriented (Draissi, Rong, & Suliman, 2023). On the other hand, the business sector representatives, namely the employers, should know exactly what to look for in candidates, thus they must be correctly informed on the required skills, especially because the market is consistently dynamic and uncertain at times (Suleman, 2017). In such manner, the harmony between the acquired skills and the required ones should meet at an equilibrium point established by the partnerships between educational frameworks and the industries.

Although being an important employment outcome metric, job satisfaction is usually overlooked in studies (Jackson & Li, 2022). Besides wage gaps, benefits and career advancement chances, the skills mismatch caused by issues in the supply and demand of competences generate displeasure and disappointment among graduates with both their past education and current employment choices, as in some graduates may regret the degrees they

studied for or the jobs they worked in (Figueiredo, Biscaia, Rocha, & Teixeira, 2017). Nonetheless, higher education is compelling for one's personal gratification, so investments in higher education generally favor a much easier process of abilities improvement on-the-job (Martini & Fabbris, 2017).

Methodology

This paper is based on a quantitative bibliometric analysis which takes into account bibliographic data, so as to argument the four research questions of this study. The chosen database was extracted from Web of Science, the world's oldest well-known source of accurate and reliable data among academics (Birkle, Pendlebury, Schnell, & Adams, 2020). The bibliometric research is most applicable to the type of exploration using large quantities of scientific data that assesses the present state of knowledge in a selected domain, by revealing networks between countries, organizations and authors, and by uncovering groups of keywords associated with a specific topic (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021). In this way, such a form of analysis discovers the gaps in the academic literature with the scope of inspiring fellow researchers to touch subjects which need major attention (Öztürk, Kocaman, & Kanbach, 2024).

In this paper, the search in Web of Science took place in February 2025 and acknowledged the following blend of keywords, the choice being related to our findings in the literature review: 'employability', 'overeducation', 'undereducation', 'educational mismatch', 'job mismatch' and 'skill mismatch'. By looking at the article title, abstract and keywords, and without considering time range, our sample size reached a number of 698 articles (n=698) which are satisfactory for our investigation. In parallel, we searched in the Scopus database by using the same combination of keywords and only 206 documents were found. Thus, we chose Web of Science as our database and exported the created list of papers to a tab delimited file proper for use in the VOSviewer software and included full record and cited references. The VOSviewer software creates visual representations of different variables and it is well suited for bibliometric analyses (Kirby, 2023). The retrieved database is composed of mainly articles (620), proceeding papers (60), book chapters (13), review articles (13), early access papers (12), book reviews (5) and one book.

Topics around the economics of education and labor economics are important subjects of debate and the literature in this area is rich. We narrowed our searches to 'overeducation, undereducation and employability' in order to see how these two cases of mismatch affect employment among graduates. Web of Science (WoS) database was more suitable for our research in comparison with other scientific databases, as it provided the largest amount of papers fit for our theme's requirements. In the next chapter, the results are exposed and discussed for each research question: (1) What subjects were researched before on the topic of overeducation, undereducation and employability in the academic literature? (2) What are the main domains in which the topic of overeducation, undereducation and employability are used? (3) Which authors, countries and institutions contributed the most on the topic so far? (4) What authors are the most cited in relation to countries and institutions?

Results and discussions

To begin with, the first two research questions will be discussed, followed by the last two.

RQ1: What subjects were researched on before on the topic of overeducation, undereducation and employability in the academic literature? and RQ2: What are the main



Count	Category
327	Business Economics
179	Education Educational Research
99	Social Sciences Other Topics
54	Public Administration
38	Environmental Sciences Energy
27	Urban Studies
21	Geography
17	Psychology
16	Demography
40	Sociology

Source: Web of Science analysis of bibliographic database as per the authors' own research.

The categories in which the studied papers are included (**Figure 3**) are Economics (235 papers), Educational Research (173), Industrial Relations Labor (70), Management (64), Sociology (60), Social Sciences Interdisciplinary (51), Business (16), Public Environmental Occupational Health (12), Political Science (11), Education Scientific Disciplines (9), Hospitality Leisure Sport Tourism (8), Computer Science Interdisciplinary Applications (5). This aspect strongly emphasizes the importance of our theme in various topics of discussion with economic significance due to the fact that education and employability play crucial roles in any domain.



Figure 3. Web of Science categories

Source: Web of Science database analysis as per the authors' own research.

RQ3: Which authors, countries and institutions contributed the most on the topic so far? and *RQ4: What authors are the most cited in relation to countries and institutions?* look more in depth at the performed work of authors, organizations and countries and the created networks between them.

The highest number of papers appeared in 2023 with 66 papers, followed by year 2020 with 63 papers, 60 papers in 2022, 59 papers in 2021, 53 papers in 2024, 44 papers in 2017 and 43 papers in 2019, as **Figure 4** shows. We would expect a growing trend for the next years as this topic on the economics of education will tackle many of the issues between the educational level and employment. The most productive authors until now were Verhaest D. (10 papers), McGuinness S. (8 papers), Miller P.W. (8 papers) and Park K. (8 papers), as per **Figure 5**. The bar chart in **Figure 6** displays USA as the most productive contributing country with 104 studies, followed by Spain with 86 studies, Germany with 65, England with 57, and Italy with 55 studies. China, South Korea, Australia, Netherlands and Belgium are as well countries which contributed to the literature on the topic, because the discussed topic has a worldwide interest for the well-being of people.

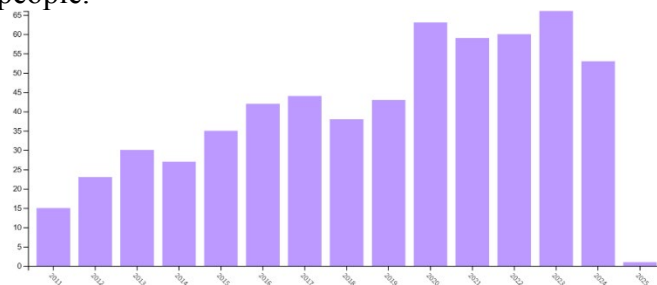


Figure 4. Publication Years

Source: Web of Science analysis based on the authors' own research.

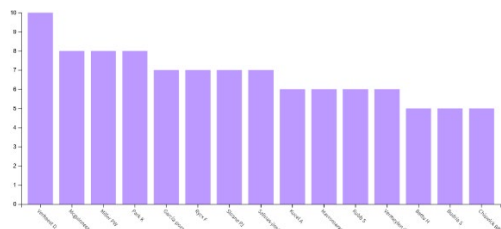


Figure 5. Authors' Productivity

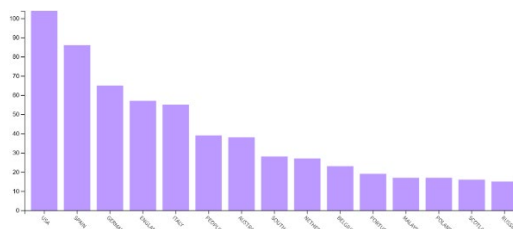


Figure 6. Contributing Countries

Source: Web of Science analysis based on the authors' own research.

The scientific papers in our database belong to publications such as *Economics of Education Review*, *Education Economics*, *International Journal of Manpower*, *Applied Economics*, *Social Indicators Research*, *Journal of Education and Work*, *Labour Economics*, or *Education and Training*. The authors' affiliations are *IZA Institute Labor Economics* (21), *Universidad de Malaga* (13), *University of London* (13), *Ghent University* (10), *Maastricht University* (10), *Stockholm University* (10), *University of Aberdeen* (9), *University of Wisconsin System* (9), *University of Amsterdam* (7), *University of California System* (7) and so many others.

In VOSviewer, the co-authorship of authors network refers to the relationships between authors and how often they have co-authored papers together. In **Figure 7**, the clusters of collaborative authors could be easily traced, showing that Verhaest Dieter, also the most productive author, has worked together with some of the other authors. The clusters are not so large, which indicates that there are few research teams on this topic.

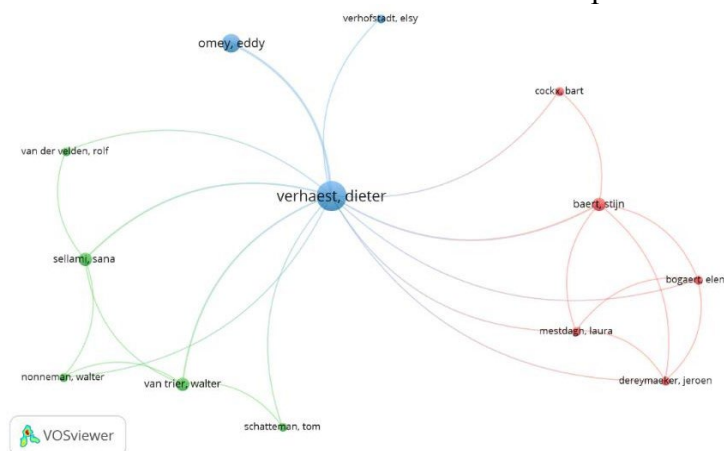


Figure 7. Co-authorship of authors

Source: Authors' own research.

The network of citation-authors indicates how many times authors have cited the work of fellow researchers. **Figure 8** highlights how the author McGuinness Seamus is the most cited author and the one who frequently cited the other authors, similar to author Verhaest Dieter. These two have the strongest link meaning that they can be considered to be leaders in this area of research. Reversely, another function of VOSviewer is to discover the network maps of authors who are usually cited together in articles. Thus, as **Figure 9** suggests, McGuinness S., Sicherman, N., Groot W., Chevalier, A. are some of the authors sharing the same interest and schools of thought on this subject. The isolated cluster containing author Ihlanfeldt, Kr. shows

that the author has the same interest on the matter, but has not cited the authors in the conglomerate of clusters on the left side.

The citation of countries network map sustains the idea mentioned above that countries worldwide collaborate on this topic, as can be seen in **Figure 10**. Here, there are many influences between countries, so various countries share research ideas and knowledge, creating a reliable literature on our topic.

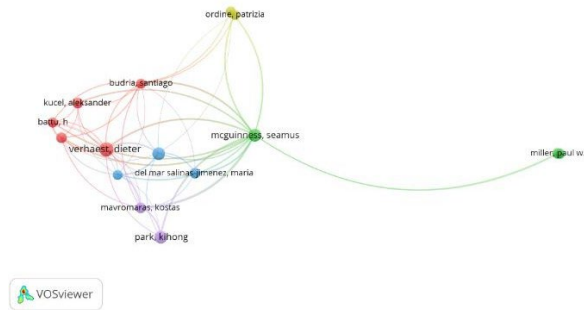


Figure 8. Cited Authors



Figure 9. Co-citation of Authors

Source: Authors' own research.

At the same time, the network based on the co-authorship of countries reveals the strong collaboration on international research between the United States, Germany, England, Spain, China, Portugal, Italy, as per **Figure 11**. Malaysia, Croatia, Poland, Colombia, Finland are examples of countries with relatively weaker connections in the academia in comparison with the other countries from the clusters.

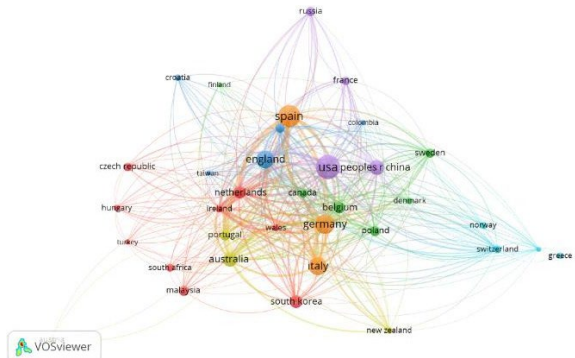


Figure 10. Citation Countries

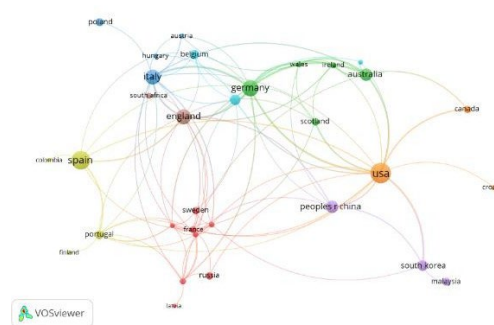


Figure 11. Co-authorship Countries

Source: Authors' own research.

Lastly, on the analysis of organizations, there are few of them which have partnerships on this research topic, and they are the IZA Institute, Ghent University, Aberdeen University and University of Western Australia (**Figure 12**). Another interesting network of organization looks at the bibliographic coupling which identifies the references cited by the institutions in their research. This fact emphasizes on the alignment of institutional research and how their work is fundamental and rooted in original and trustworthy sources. **Figure 13** exemplifies the strong institutional connections and how the bibliographic basis of the organizations' scientific studies relies on similar references.



Figure 12. Co-authorship of Organizations

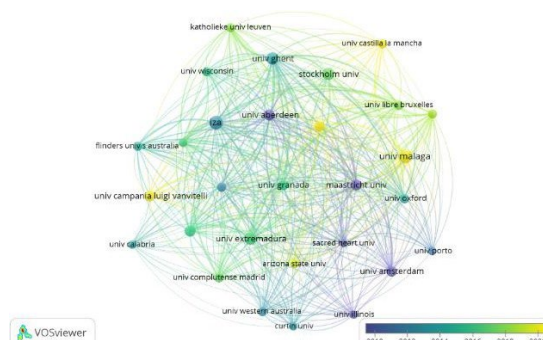


Figure 13. Bibliographic Coupling of Organizations

Source: Authors' own research.

Conclusion

Overeducation and undereducation fall in the mismatches category and they can affect the normal path of graduates' employment. This study focused on bibliometric indicators about relevant authors, countries and organizations and it has set the actual level of knowledge on the subject of three major aspects of the economics of education and labor economics: overeducation, undereducation and employability. The current database is rich and it is growing daily because of the importance of the topic and its applicability in real life situations encountered by many students, graduates and professionals. Our study proves that there are many connections between authors, organizations and countries, so there is space for future research connectivity for the literature's adaptation. The study can be extended to other areas of the two categories, such as productivity, dropouts and employment, demand and supply in the educational system and the labor market, and so on. The limitations consist of missing data on self-citation of authors in our database, which could potentially lead to distortions in networks. Geographic biases could interfere as well due to the fact that the most productive, cited countries also strongly collaborate, which may marginalize research from developing countries, where the issue of unemployment might be higher.

The importance of our paper is directed towards potential future research on factors that influence employability and their connection to educational attainment. The role of education has implications in graduates' efficient insertion on the labor market, and, as this market is changing at a fast pace, required skills and competences, which are mainly produced by education, can change too. Educators, as well as employers, need to find common grounds so that to create prosperous environments in which professionals can thrive.

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