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## Content and Bibliometric Analysis of Education as a Competitive Advantage of Business

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Abstract: This article aims to ground education as a competitive advantage of business based on content and bibliometric analysis. The paper examines the relationship between education level and business quality and leadership. It is highlighted that matching the level of education with business needs can ensure a higher level of labour productivity and better company results. The higher the level of education, the more an employee can benefit the company by working more efficiently and working with more ideas and innovations. The article also considers the importance of continuous learning and skill development for increasing business competitiveness and leadership in the modern world. For reaching the research goal, the methodology of data collection, content analysis, and synthesis from various sources, as well as bibliometric analysis of scientific publications indexed by the Scopus database using Bibliometrix and VosViewer software and R Studio programming language, was used. Over the past few years, the impact of education on business has received significant interest in the scientific community, as evidenced by the growing number of publishing articles indexed by the Scopus database. Four research clusters covered 10,914 keywords, and 95,636 connections in this context were formed. Multiple Correspondence Analysis allows the discovery of underlying structures in a set of categorical data (niche topics; developing topics; declining themes; most common topics and main topics). The research also covers case studies of companies that invest in training their employees to study the impact of such investments on business efficiency and competitiveness and analyses the opinions of business and education experts to assess the impact of education on business and the economy. The results of the conducted analysis confirm that investing in education is useful for business, contributes to the attraction of highly qualified employees, increases the level of productivity and competitiveness, and is also a guarantee of ensuring the successful functioning of the company in unpredictable conditions.

**Keywords:** competitiveness, employees, innovation, investment, knowledge, productivity, skills, technology. **JEL Classification:** I23, L26, M21.

Received: 30 April 2023

Accepted: 03 June 2023

Published: 30 June 2023

**Funding:** This research was funded by the Ministry of Education and Science of Ukraine and performed the results of the project «Business-Education-Science Coopetition: Institutional and Economic Models of Innovation Transfer for National Security and Sustainable Development» (Nº 0122U000772).

**Publisher:** Academic Research and Publishing UG (i.G.) (Germany) **Founder:** Sumy State University and Academic Research and Publishing UG (i.G.) (Germany)

**Cite as:** Kharchenko, D. (2023). Content and Bibliometric Analysis of Education as a Competitive Advantage of Business. *Business Ethics and Leadership*, 7(2), 99-108. <u>http://doi.org/10.21272/bel.7(2).99-108.2023</u>.



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## **Content and Bibliometric Analysis of Education as a Competitive Advantage of Business**

## Introduction

Education is often seen as a key driver of economic growth and development, equipping people with the skills and knowledge they need to succeed in the workplace and contribute to society. However, the benefits of education go beyond the individual level and can significantly impact business and the economy. One of the most important ways education affects business is its effect on productivity. Education equips people with the skills and knowledge needed to perform work more effectively, which can lead to higher levels of productivity and efficiency. It, in turn, can lead to improved business performance and competitiveness. Beyond productivity, education also stimulates innovation and creativity, giving people knowledge and tools, they need to develop new ideas and approaches. It is especially important in industries that rely on creativity, such as the arts, media, and technology. Innovation and creativity lead to the development of new products and services and give companies a competitive advantage in the market.

On the other hand, education plays a crucial role in improving management practices. It helps managers develop better leadership skills and improve their ability to lead and motivate employees. It contributes to improving employees' morale and job satisfaction, which, in turn, has a positive effect on business efficiency. In addition, training can improve access to finance. Lenders often perceive firms whose owners or managers have a higher education level as less risky and, therefore, more attractive to lenders. It can be critical for businesses looking to grow and expand too. It is also important to emphasize the role of education in the international arena. The degree of relations in the international labor market and the level of international competitiveness depends on the quality of education. Individuals with a higher level of education are better prepared to compete in the global market because they have the skills and knowledge needed to navigate complex global markets and develop effective strategies to compete with international competitors. Therefore, investment in education is critically significant for every country's economic growth and development because education is a critical driver of social mobility, better employment opportunities, decent working conditions, economic growth, and sustainable development.

When considering the impact of education level on business and competitiveness, as well as investment in education, such important aspects should be emphasized: inequality of access to education, lack of relevant skills, cost of education, "brain drain", impact on innovation, and implementation problems. Unequal access to education means that education may be expensive and not equally accessible to all people, potentially leading to inequalities in educational attainment and opportunities. The skills and knowledge provided by education may not always match the needs of the business world, leaving graduates with a skills gap that can affect their competitiveness. Similarly, some education systems may not pay enough attention to developing practical skills, hindering business growth and competitiveness. In a particular category of education seekers, the question arises: "Do you even need an education to succeed in business?" The problem with investing in education is that the price of an investment can be too high and expensive for individuals, businesses, and governments. Achieving a balance between investment in education and other priorities is difficult, especially in low-income countries or during economic downturns. "Brain drain" means that in some cases, highly educated people may decide to leave their country for better job opportunities or higher wages, leading to a brain drain effect. While education can lead to increased innovation and creativity, it can also have the opposite effect. Mechanical learning or a focus on specific skills can limit people's ability to think outside the box and develop new innovative ideas, which can hinder business competitiveness.

Overall, the impact of education on business and competitiveness is associated with many challenges that need to be addressed to enhance the positive effect on the economy and society. Therefore, studying the connection between education and business is urgent, considering their coopetition interaction. The article aims to ground education as a competitive advantage of business based on content and bibliometric analysis.

### Literature Review

Drucker (1967), often called the father of modern management, suggests that education is necessary to develop a strong ethical foundation, which is essential for long-term business success. He argues that businesses with a strong ethical framework are more likely to succeed long-term and that education is





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critical in developing this foundation (Drucker & Ellner, 1976). Porter (1990), a leading specialist in competitive strategy and competitiveness of nations and regions, argues that education is essential for creating a competitive advantage in business. He suggests that education allows people to develop unique skills and knowledge that are difficult to reproduce and can lead to high-quality businesses (Porter, 2008). Christensen (1997), an expert on disruptive innovation and author of The Innovator's Dilemma, also emphasizes the importance of education in building a successful business. He grounds that education allows to think creatively and develop new business models that can disrupt existing industries and create new growth opportunities.

According to the research of Heckman & Kautz (2012) and Hanushek (2013), there is a positive correlation between education and business productivity. Their study showed, on the example of OECD countries, that a higher level of education leads to an increase in employees' productivity, which, in turn, positively affects the quality of business. Also, the study notes that investment in education can lead to long-term economic growth and development.

The World Bank study notes that investment in education is important for promoting economic growth, reducing poverty, and improving people's quality of life (UNN, 2020; Hanushek & Woessmann, 2007; Barónaija et al., 2023). Research highlights that education is positively correlated with higher earnings and better employment opportunities, which can lead to a more skilled and productive workforce, ultimately increasing business competitiveness (WEF, 2018). Scientists Reijseger et al. (2017) note that a higher level of education is positively correlated with job satisfaction, which contributes to improving business results. Employees with a higher level of education are more engaged and committed to their work, which leads to higher productivity and better business results. Wang & Noe (2010). examine the impact of investment on the level of education and prove that investment in education improves the skills and competence of employees, which will lead to better job satisfaction and a more significant commitment of the workforce. Therefore, many studies by world scientists claim that a qualified and educated workforce is crucial for business prosperity in the conditions of the modern globalized, digital, and competitive economy.

Besides, Koibichuk et al. (2022a) confirmed that employment in high-tech businesses is an essential factor of socio-economic development. Samoilikova et al. (2022) investigated «business – education – science» coopetition, the transfer of innovations connected with it and their effect on sustainable development in general. Koibichuk et al. (2022b) also studied the coopetition of education and business, especially bibliometric aspects. However, in the study by Cranson (2018), it is noted that the level of education of employees is not always a guarantee of a successful business. The study found that the most important success factors are leadership skills, expertise in chosen fields, innovation ability, and openness to new ideas. Levine & Renelt (1992) and Easterly & Levine (2001) analysed data from 50 countries and found that higher education level can help run a business, it does not guarantee success. Leadership skills, expertise in chosen fields, ability to innovate and openness to new ideas may be more important for successful business operations. Therefore, it is necessary to consider whether education and investments in knowledge really have an impact on business and competitiveness.

#### Methodology and Research Methods

The impact of education on business performance and competitiveness is a complex issue that is the subject of numerous studies. The complex methodology was used to investigate the problems of education and its impact on business and investments in knowledge. Research methods included data collection, content analysis, and synthesis from various sources, as well as bibliometric analysis of scientific publications indexed by the Scopus database using Scopus tools, Bibliometrix and VosViewer software and R Studio programming language (Aria & Cuccurullo, 2017). Multiple Correspondence Analysis (MCA) allows the discovery of underlying structures in categorical data (niche topics; developing topics; declining themes; most common topics, and main topics). The article also conducts case studies of companies that invest in training their employees to study the impact of such investments on business efficiency and competitiveness and analyses the opinions of business and education experts to assess the impact of education on business and the economy.



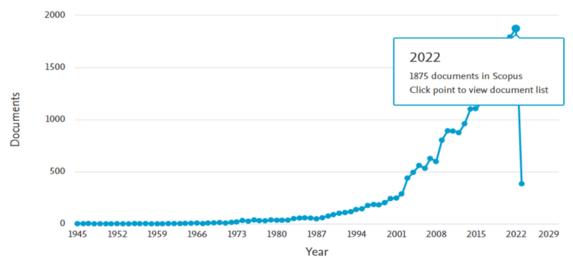


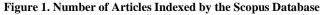
#### Results

Case studies of successful companies worldwide (Google, Southwest Airlines, Zappos) and organizations that explain their success, in part, by education and training, were considered. Google has been known for its culture of innovation, and education plays a key role in fostering that culture. The company offers a variety of training and education programs to its employees, including courses in leadership, coding, data analysis, and more. In addition, Google has a '20% time' policy, which encourages employees to spend 20% of their work time pursuing projects and interests that are not part of their primary job duties. This policy has led to many successful new products and features like Google Maps and Gmail. Google's commitment to continuous education and innovation has helped the company maintain its position as a leader in the technology industry (Duhigg, 2016). Southwest Airlines is a highly successful airline known for its low fares and customer-friendly policies. Its commitment to employee training and development is a key factor in its success. Southwest offers extensive training programs for its employees, including training in customer service, safety, and technical skills. In addition, the company encourages its employees' continuing education and professional development by offering compensation for work-related courses. This focus on education and training has helped Southwest create a highly skilled and motivated workforce, contributing to its success in the highly competitive airline industry (Gittell, 2011).

Zappos is an online shoe and clothing store known for its exceptional customer service. Education and training are key components of Zappos' customer service strategy. The company has a rigorous training program for new employees, including classroom training, observation of experienced employees, and on-the-job training. In addition, Zappos encourages continuing education and professional development for its employees by offering compensation for work-related courses. This emphasis on education and training has helped the company create a highly skilled and customer-oriented workforce, contributing to its success in the highly competitive online retail industry (Chafkin, 2009). Overall, these case studies demonstrate the importance of education and training for the success of businesses and organizations. Education can help create a skilled and motivated workforce, foster a culture of innovation and creativity, and improve customer service and satisfaction. By investing in education and training, businesses can gain a competitive advantage and achieve long-term success. To find out whether the topic "How the level of education affects business and whether it is worth investing in education" is an important one, a study using the content and bibliometric analysis of publications indexed by the Scopus scientometric database was conducted.

Over the past few years, the impact of education on business has received significant interest in the scientific community, as evidenced by the growing number of published articles on this topic. For example, articles on "education and business and investment in education" in the Scopus database increased from less than 100 in 2000 to more than 2,000 in 2022. Most articles were published in the last ten years (Figure 1).





Source: Developed by the author using Scopus database tools

The increase in articles shows the growing interest in "Education and business" among scientists and other specialists. Firstly, it is related to the understanding that employees' education level clearly affects business competitiveness. Secondly, to improve the quality of education and training to prepare a skilled workforce





for the labour market. The increase in the number of articles also indicates a growing interest in developing business education programs and scientific research in this direction, as well as investing more in training. The top 15 countries whose scientists published the most articles on "How the level of education affects business, and whether it is worth investing in education", are shown in Figure 2.

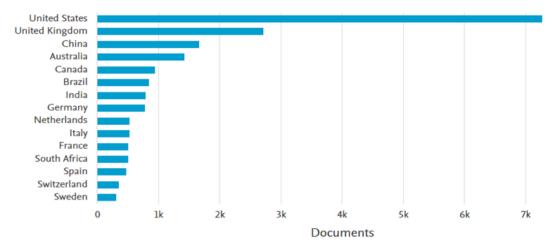


Figure 2. The Number of Published Articles in Different Countries of the World (K is 1000 Publications) Source: Developed by the author using Scopus database tools

According to the analysis results, the largest number of articles on education and business was published in the USA, Great Britain, China, Austria, Canada, etc. These countries have highly developed higher education systems and economies. They are home to world-leading universities that attract many scientists and researchers who conduct research in education and business. In addition, they have powerful research centres, firms, and organizations engaged in research in this field. Also, the culture of innovation and entrepreneurship is supported in the countries, which creates a favourable environment for business development and uses the latest management methods, which can be the object of research in education and business. The universities whose research workers published the most articles can be distinguished: the University of California, the University of Nebraska Medical Centre, Monash University, the Federal University of Rio Grande do Norte, etc (Figure 3).

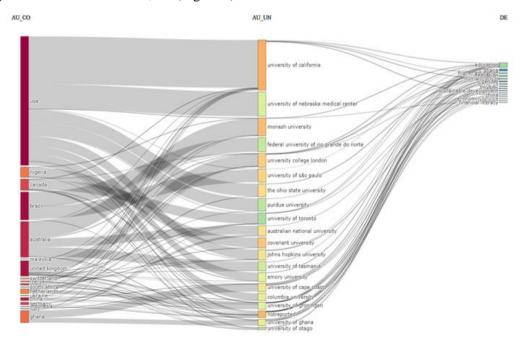


Figure 3. List of Universities that are Most Actively Involved in Business Education Research Source: Compiled by the author using Bibliometrix software and the R Studio programming language







The universities of the USA, Great Britain, Canada, and Austria are leaders in education and scientific research and have extensive experience and resources for conducting research. They also have strong research programs in business and management, which gives them high competitiveness in conducting research. In addition, many leading companies in the countries follow the latest trends in business and actively invest in research, which also stimulates research on this topic in higher education institutions of these countries. Thus, it can be concluded that education and business is a relevant topic for research in many countries of the world. The analysis of keywords in a sample of 825 publications, most often used by authors in articles, is shown in Figure 4. Such a keyword cloud was built using the Bibliometrix software, the R Studio programming language, and the Biblioshiny package (Aria & Cuccurullo, 2017). A total of 10,914 keywords were found, jointly used by authors in 825 publications, with the smallest number of keywords being 5 (Figure 4).



Figure 4. Cloud of Keywords Characterizing the Circulation of "Investment in Education – Business Level"

Source: Compiled by the author using Bibliometrix software and the R Studio programming language

Analyzing the same 825 publications in Vosviewer software made it possible to divide keywords into clusters. The number of connections between publications where the authors use five or more of the exact keywords is 44,757, and the total number of connections between the entire sample of publications is 95,636. The logic of cluster formation is related to the relevant, meaningful aspects of using keywords. So, for example, a group of publications in which the authors researched educational technologies in the medical field is marked in green, in red – the role of higher education for economic growth and the need to invest in education, in yellow – gender aspects of education, the age category of students, in purple – the role of health in getting an education, investing in education as a means of improving health, the social status of a person studying (married or single) (Figure 5).

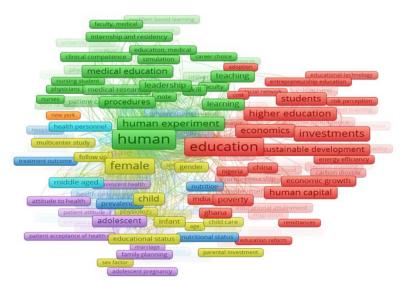


Figure 5. Keyword Relationship Graph

Source: Compiled by the author using Vosviewer software



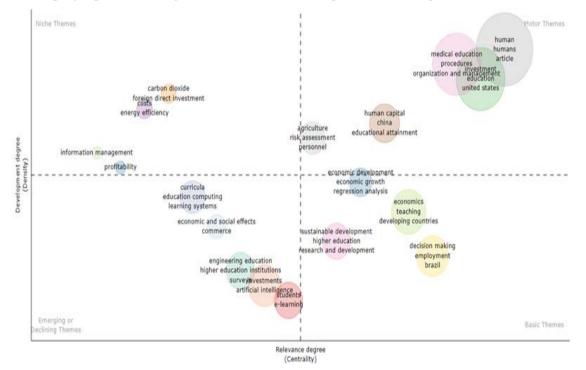


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Analysing the most used keywords (Figures 4, 5) shows that these are education, people, investments, and leadership. "Education" describes the process of learning and acquiring knowledge, which is the basis of any business. "People" provides education and business are directly related to the people who are the key players in these industries. In education, a person is the main subject who receives knowledge and develops his skills and competencies. In business, people are the main factors that ensure the efficient operation of the company, business development and profit.

"Investments" in education are also usually made to improve the quality of education and increase the level of competence of people. Thus, the word 'human' can be found in articles about investment in education because education is directly related to people and their development. Consequently, in articles about education, business and investment in education, the word 'people' is used to emphasise the importance of the role of people in these industries and the development of human capital as a key factor in achieving success. "Investments" comes up a lot because investing in education is an important element in the development of society. Investments in education can be made at different levels – from state investments in national education to investments by private companies in the training and development their employees. Investing in education can improve the quality of education, increase access to learning and develop human capital, which in turn contributes to the development of business and the economy. Moreover, investing in education can provide future workers with the necessary skills and competencies, which can be an important factor for companies looking for skilled workers.

"Leadership" means the success of any business or educational organization depends largely on competent leadership. Firstly, articles that discuss the topics of leadership in education and business may aim to investigate the effectiveness of various leadership methods, identify the most effective leaders in the field, or consider specific examples of successful leadership. Secondly, investors investing in education often make sure that the management of a university, school or other educational organization is experienced and able to manage projects effectively. It may include budget management, strategy development and operational planning. Thus, articles on investment in education may focus on the importance of effective leadership for successfully implementing investor projects. Therefore, the word 'leadership' can be found in articles about education and business as an important success factor, or in terms of describing specific investment projects in education. Therefore, these keywords indicate that articles about education and business focus on the importance of knowledge, skills, and management in the business environment, as well as on the latest technology and entrepreneurship. Figure 6 shows which sector keywords fall into: niche topics; developing topics; declining themes; most common topics and main topics.





Source: Compiled by the author using Bibliometrix software and the R Studio programming language





Multiple Correspondence Analysis (MCA) allows the discovery of underlying structures in a set of categorical data. As seen in Figure 6, keywords related to emerging topics include engineering education, student learning, artificial intelligence, and economic and social impact. Firstly, the growth in the number of students and the popularity of higher education leads to an increase in the demand for quality education and innovation in the field of learning. In addition, rapid technological development in business and industry requires highly qualified specialists with engineering education. Secondly, artificial intelligence is one of the fastest-growing fields of technology that can potentially change many aspects of modern life, including business, science, medicine, and other fields. It creates a significant demand for specialists with knowledge and skills in artificial intelligence. Therefore, the development of these topics takes place under market demand and the needs of society.

Topics such as information management, foreign direct investment, and profitability may be considered niche because they are specific and not general issues of interest to most people. However, these topics can be very important for some business, economics, and science fields. For example, information management is becoming increasingly important in today's digital world, where data volumes are growing exponentially. It may include aspects such as data collection, processing, and analysis, as well as its storage and protection against cyber-attacks. Foreign direct investment can be important to developing a country's economy and business, as it can help attract new technologies, financial resources, and expertise. Profitability is important for businesses and investors looking to profit from their investments and projects. It may include risk management, financial planning, and market analysis. So, these topics may be niche, but they may be relevant to certain areas of business and science.

Core topics are fundamental and widely discussed in various fields, including business, science, politics, technology, etc. For example, the economic situation affects business, investment, and other aspects of people's lives, so it is an important topic for discussion and analysis. Higher education, in turn, is a key factor for economic development, as it provides the knowledge and skills necessary for the development of society. Therefore, such topics usually belong to the main ones. Motor topics indirectly connect to the economy, business, or investment but are essential to people and society. For example, medical education and health are related to motor topics because, without health, it is impossible to achieve success in any area of life. Similarly, issues related to man and humanity are motorised because they concern human values and ethical issues. Education can also be related to motor topics, as its meaning is to help people develop their potential and improve their knowledge and skills, which can lead to better lives and an increase in the quality of people's lives. Based on the conducted research, education and its impact on business and investment in education is highly relevant and is receiving more and more attention in scientific research. In recent years, the number of published articles on this topic is constantly growing, which indicates a growing interest in this issue. So, the high interest in this topic on the part of scientists and researchers suggests the importance of education as a factor in business development and its role in the formation of effective investment strategies.

#### Conclusions

The article grounds education as a competitive advantage of business based on content and bibliometric analysis. It was identified that over the past few years, the impact of education on business had received significant interest in the scientific community, as evidenced by the growing number of publishing articles indexed by the Scopus database. The articles on 'education and business and investment in education' increased from less than 100 in 2000 to more than 2,000 in 2022. Most of these articles were published in the last ten years. Four research clusters covered 10,914 keywords, and 95,636 connections in this context were formed (educational technologies in the medical field; the role of higher education for economic growth and the need to invest in education; gender aspects of education, the age category of students; the role of health in getting an education, investing in education as a means of improving health, the social status of a person studying (married or single)).

Analysing the most used keywords showed that these were education, people, investments, and leadership. Multiple Correspondence Analysis allowed the discovery of underlying structures in a set of categorical data (niche topics; developing topics; declining themes; most common topics and main topics). The research also covered case studies of companies that invest in training their employees to study the impact of such investments on business efficiency and competitiveness and analysed the opinions of business and education experts to assess the effect of education on business and the economy. Numerous studies by world scientists





have shown that education positively affects business efficiency and the country's competitiveness. Employees with a higher level of education tend to be more productive, adaptable, and innovative, contributing to business success. Higher levels of education are also associated with higher wages and job satisfaction, leading to lower turnover and better employee retention. Investing in education has significant long-term economic benefits. Education is critical in developing a skilled and competitive workforce that drives economic growth and innovation. In addition, investments in education lead to improved social mobility, reduced income inequality, and better health outcomes. Despite the positive impact of education on business outcomes, there are persistent skills shortages in many industries where employers struggle to find workers with the right skills and qualifications. It highlights the need to adapt education to the needs of business and the labour market, emphasising providing relevant skills and training. The importance of lifelong learning should also be emphasised. With rapid changes in work and technology, lifelong learning is becoming increasingly important. Businesses prioritising their employees' continuous learning and training are more likely to remain competitive and innovative.

So, the article considers the importance of employee education for successful business operations and notes that investing in education is the best investment of money. A high level of employee education ensures an increase in business competitiveness, as it increases the quality of a product or service, reduces costs, and increases production efficiency. In addition, increasing the level of education of employees promotes the development of innovation and new technologies, which helps businesses to remain competitive in the market. Investing in education is one of the best investments of money, as it not only improves the level of education and provides competent workers but also contributes to the development of society as a whole. Investing in education helps to reduce the unemployment rate and increase the income of the population, which will contribute to the growth of the economy and the development of business.

Author Contributions: Conceptualization: Diana Kharchenko; methodology: Diana Kharchenko; software: Diana Kharchenko; validation: Diana Kharchenko; formal analysis: Diana Kharchenko; investigation: Diana Kharchenko; resources: Diana Kharchenko; data curation: Diana Kharchenko; writing-original draft preparation: Diana Kharchenko; writing-review and editing: Diana Kharchenko; visualization: Diana Kharchenko; supervision: Vitaliia Koibichuk; project administration: Diana Kharchenko.

Conflicts of Interest: Author declares no conflict of interest.

Data Availability Statement: Not applicable

### Informed Consent Statement: Not applicable

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