Vol.6 No.1, pp.31-47, May 2025
ISSN:2026-9153 (Online), 2026-8009 (Print)

https://journals.ium.edu.na
DOI: https://doi.org/10.64375/g84dxe87

NJMS
NAMIBIA JOURNAL OF MANAGERIAL SCIENCES

Received: 07 July 2024 Accepted: 04 April 2025 Published: 01 May 2025

Exploring the Role of Tax Revenue in Funding Higher Education to Meet Industry Needs and Foster Sustainable Development: A Review of Existing Literature.

Anna Caroline Nakale-Kawana

The Faculty of Environment and Sustainable Tourism, The International University of Management, Windhoek

kaw071962@gmail.com

ABSTRACT

This study explored the role of tax revenue in funding higher education to meet industry needs and foster sustainable development, using existing literature. Tax revenue is important for economic growth and development. Governments use tax revenue to fund needs, including infrastructural development, education, health and social amenities. The alignment of public and tax revenue with Sustainable Development Goals (SDGs) contribute to high-quality education that meet industry needs. In the last few decades, a wide range of works have featured studies documenting the alignment of public finance to high education that meet industry needs and contributing to development. The present study employed a secondary method to systematically review relevant literature to answer the key research question of what role tax revenues play in funding higher education with focus on alignment with industry needs to promote sustainable development. Research papers, journals and articles covering the time period 2017 to 2024 were included in the review as obtained from databases mostly Google Scholar. The publications were reviewed based on a thorough screening of abstracts and introductions. A total of 35 relevant scholarly publications were reviewed and analysed to obtain themes used to present findings and conclusions drawn by the study. A thematic literature review was employed to organise and synthesising existing literature around common themes. The reviews of the existing literature did not only answer the research question, but also added to the exiting knowledge on the role of tax revenue in funding higher education to cater for industry requirements and encourage sustainable development. Following the discussed methods of the study, a conceptual framework that defines the relationships between the concepts of public funding, high education, industry needs and sustainable development was devised.

Keywords: Tax revenue, Sustainable Development, University-Industry Collaborations, Industry needs

1. INTRODUCTION

Taxation is used by governments to mobilise revenue for supporting poverty alleviation, social justice and economic growth. Taxation constitutes 70% of government revenue in low-and lower-middle-income nations (Hannah et al., 2023). Education benefits the economy by providing developmental skills (Sanchez-Carrillo et al., 2021; Yue, 2023). Higher education institutions (HEIs) play a crucial role in achieving the Sustainable Development Goals (SDGs) and the 2030 Agenda established by the United Nations General Assembly in 2015. The collaboration between universities, research and development centres, and industries fosters an environment conducive to skills transfer, knowledge sharing, innovation, design, and creativity, all of which promote development. According to Xing and Marwaha (2017), Higher Education (HE) in the era of the Fourth Industrial Revolution (HE 4.0) presents a complex and exciting opportunity with the potential to significantly improve society. The authors further stated, driven by artificial intelligence (AI), the Fourth Industrial Revolution (4IR) will shift the workplace from task-based roles to those focused on human-oriented features. This transition will necessitate interdisciplinary education, exploration, and innovation. According to Berbegal-Mirabent et al.

(2019), a platform is required to facilitate initial connections between university students and teaching staff with relevant industries. On the basis of the above discussed, the study aims to review the existing literature on the use of tax revenue in funding higher education and its impact on meeting industry needs to address sustainable economic growth. The study was conducted to explore how tax revenues are utilised to finance higher education systems and how this funding can be aligned with the evolving needs of industries. The study aimed to identify the relationship between tax-funded education and sustainable economic development, particularly focusing on how well-educated workforces can drive industry growth and innovation. By reviewing existing literature, the study sought to provide insights into effective funding strategies, highlight best practices, and offer recommendations for policy-makers to enhance the alignment of higher education outputs with industry demands, ultimately contributing to sustainable economic growth. The Human Capital Theory postulates that investments in education and training increase the productivity and efficiency of individuals, which in turn enhances economic growth (Bandara, 2023). Higher education is regarded as a non-rivalrous and non-excludable good, justifying the use of tax revenue for its funding. Advancements in innovation, knowledge, and human capital enhance productivity, thereby improving the economic outlook.

1.2 The Nexus between Higher Education and Industry

The collaboration between HEIs is a cornerstone of innovation and economic growth. According to Shah and Gillen (2023), University-Industry Collaborations (UIC) contributes to sustainable economic development. Based on Etzkowitz and Leydesdorff's (2000) "Triple Helix" model, the potential for economic development lies in efficient government-industry-university collaborations (Cai & Etzkowitz, 2020; Figueredo & Fernandes, 2021). Figure 1 shows the strong interplay between critical social systems: industry, universities, and governments (Zakaria et al., 2023).

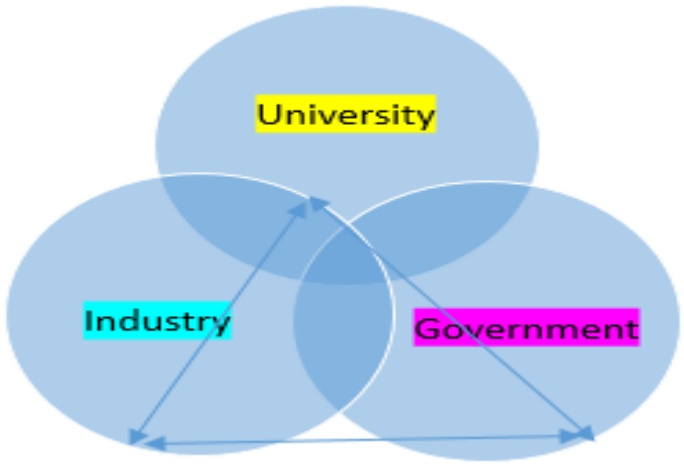

Figure 1: The Triple Helix Model

Source: Adopted from Zakaria et al. (2023)

In recent years, numerous Organisation for Economic Co-operation and Development **(**OECD) countries have undertaken curriculum reforms to better prepare children with the knowledge, skills, and competencies required for the future. Gouëdard et al. (2018) noted that several OECD countries engaged in curriculum reform, including; Estonia, Finland, Japan, Norway, and Wales (United Kingdom). The authors further noted that more than 40 countries are participating in the OECD-led education 2030 project, an effort that explores the skills and competencies that are needed for children to thrive in the 21st century. Berbegal-Mirabent et al. (2019) examined how educational crowdsourcing platforms can enhance collaboration between universities and industries in joint undergraduate and graduate program initiatives. They classify these platforms into three primary types based on their main focus: education, crowdsourcing, and networking. The platforms enable experiential learning, foster skill development, and stimulate the creation of innovative solutions to address industry needs. Paleka and Radić (2020) demonstrated in their empirical study of Croatia that higher education funding significantly influences economic growth. Ho et al. (2023) revealed that while tax revenue generally promotes economic growth, trade openness enhances this effect up to a point, beyond which excessive openness diminishes the positive impact.

1.3 Policy Frameworks and Case studies

Different approaches are followed by different countries in financing high education through taxpayers' money

to enhance Industry - University Collaboration (IUC); (Abatau, 2021). It is important to note that this study regard tax revenue for high education funding having reference to the funds collected from various taxes (such as income tax, property tax, sales tax, etc.) that are allocated to fund high education. In different countries and tax systems, the funds are typically collected by federal, state, and local governments and then distributed to support high education systems. In both Germany and Russia, financing occurs at three levels: federal (state), regional (provincial), and local (municipal) (Pereverzeva & Shamne, 2017). While a large portion of this funding comes from tax revenues, public education funding can also include other sources such as: federal grants and subsidies**,** state and local government contributions**,** private donations and grants**,** special funding programs and initiatives**.** The primary investor in specialist training in European countries is the government, which is tasked with financing the training of specialists to supply staff for both the public sector and strategic areas of private industry (Hryhorash et al., 2020). In Argentina, federal tax revenue redistribution is a fiscal mechanism used to allocate tax revenue to education financing (UNESCO, 2021).

Berbegal-Mirabent et al. (2019) indicated that collaborative platforms give benefits to all stakeholders by providing experimental education, increasing the acquisition of skills, and foster the improvement of fresh ideas to meet industry needs. The Scandinavian countries put importance on public funded education. In Denmark, Sweden and Norway, public funding devoted to high education was 1.8, 1,6 and 1, 4% respectively of their Gross Domestic Products (GDP) in 2012 (Bégin-Caouette, 2017). Bégin- Caouette (2017) noted Europe's 2020 headline to increase public and private funds for Research and Development (R&D) to 3% levels of GDP. According to Eurostat (2019), in 2017, the Member States of the European Union (EU) collectively spent nearly €320 billion on Research and Development (R&D), as shown in figure 2.

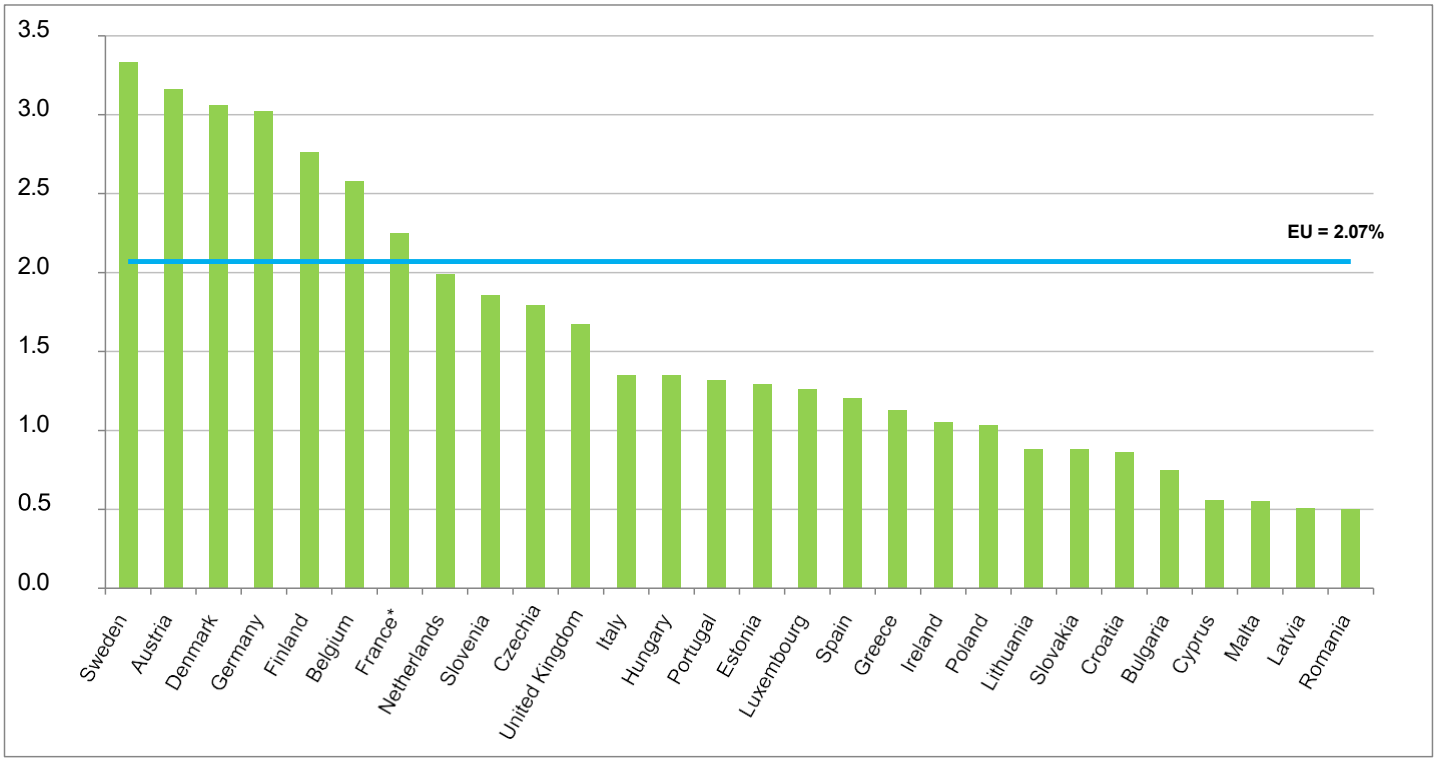

Figure 2: Research and Development (R&D) intensity across EU Member States in 2017.

Source: Eurostat (2019)

Sweden (3.33%) and Austria (3.16%) recorded the highest R&D intensities, followed by Denmark (3.06%) and Germany (3.02%), each investing over 3% of their GDP in research and development. On the lower end of the spectrum, eight member states reported R&D intensity levels below 1%: Romania (0.5%), Latvia (0.51%), Malta (0.55%), Cyprus (0.56%), Bulgaria (0.75%), Croatia (0.86%), as well as Lithuania and Slovakia, each at 0.88%.

The Biden-Harris administration has allocated $44.5 million to 22 higher learning institutions for the Rural Post-Secondary and Economic Development (RPED) initiative, aiming to enhance career quality and meet industry demand (MSM Reporter Bureau, 2024). In Germany, government legislation significantly influences higher education by promoting interdisciplinary initiatives at universities (Leišytė et al., 2022). The authors further noted

that German HE system is a federal, largely public system with a state-dominated funding model and the funding of public HEIs lies with the 16 states. Limbo (2020) highlighted the Namibian government's substantial investment in higher education and skills development. Indrawati and Kuncoro (2021) examined Indonesia's preparedness to enhance human capital in response to demographic changes and economic restructuring, with the goal of leveraging technological advancements from the 4IR. The authors observed signs of premature de-industrialisation in Indonesia, emphasising the need to boost productivity to adapt to digital and structural economic changes. Lifelong education has become essential in the era of the 4IR. Consequently, educational curricula must emphasise appropriate digital skills to prevent unnecessary labour force disruptions caused by robotics. There is a growing demand for a skilled workforce, highlighting the critical role of higher education in meeting this need. Nkwanyane (2023) indicated that South Africa's Ministry of Higher Education and Training has significantly revamped the technical and vocational education and training (TVET) sector to address socioeconomic issues such as poverty, unemployment, and inequality. Aligned with the mission outlined in the White Paper for Post-School Education and Training, TVET programs are prioritised for their importance in addressing societal challenges (Nkwanyane, 2023). Nkwanyane (2023) further observed that these programs focus on providing industry-aligned skills to youth and young adults, facilitating their successful entry into the workforce and promoting sustainable livelihoods.

Pal (2023) noted that education is universally recognised as the most crucial instrument for socioeconomic development and acts as a catalyst for enhancing productivity and fostering technological advancements. As the population's education level rises, it unlocks and expands various sectors of the economy. According to Ramli et al. (2018) the context of the 4IR and the 11th Malaysia Plan (2016-2020) outlined six strategic thrusts. The thrusts aimed at transforming Malaysia into an advanced economy by 2020. Among these strategic thrusts, green skills, on which the authors noted that integration of green skills within the TVET program promotes sustainable development, address poverty, and foster inclusive economic growth. Researchers gave light on the value of curriculum flexibility which gives nations the ability of producing graduates with needed skills for industries. Fan et al. (2019) used a sample of 146 Taiwanese universities, and found that both government and industry funding expedited UIC regulations. The authors recommended further state funding for ample impact on establishing the UIC. Tax revenue-funded initiatives that give positive impact to the collaboration of academia and industry, would foster developmental agendas matching with industry needs. Tax revenue therefore become imperative to support R&D, that create new services and goods leading to economic development and creativity in academia.

According to UNESCO (2022) globally, total public HE spending increased in real US$ purchasing power parity (PPP) in every year. Figure 3 shows comparison of total public spending patterns relative to enrolment trends reveals a contrasting scenario. The figure further shows a global public spending per student rising by 7% between 2006 and 2018, reaching USD 4,758 (in real PPP terms). Europe and Northern America saw a significant advantage, with per-student spending increasing by 36% to USD 10,541 in 2018. Eastern and South-Eastern Asia was the only other region to record an increase, with a 56% rise, bringing spending per student to USD 3,509 (UNESCO, 2022). UNESCO (2022) stated in contrast, all other SDG regional groupings experienced a decline in per-student public spending. The legends for figure 3 are as follow:

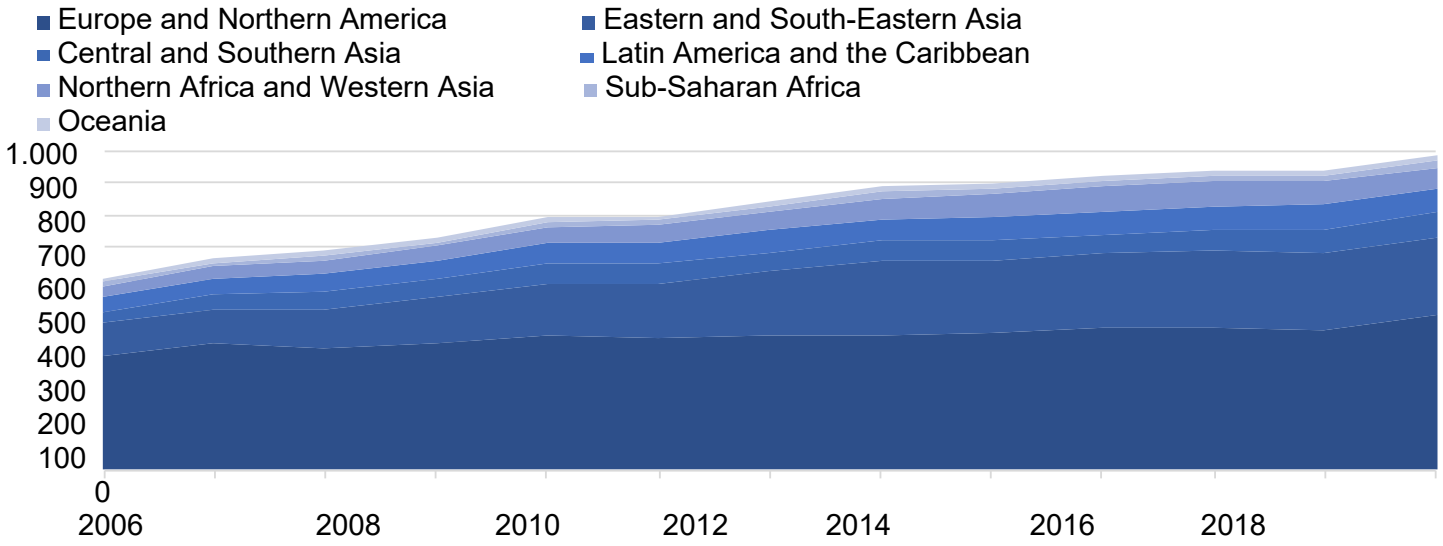

Figure 3: Total Public Spending on HE by super-region, 2006- 2018 at PPP (in billions of 2018 USD)
Source: UNESCO (2022)

With enrolment in higher education having increased over the past years and the proliferation of diverse educational providers, securing sufficient financing has become increasingly crucial to uphold equality and affordability in higher education. As noted by Williams and Usher (2022) public investment in higher education in a set of 55 countries increased by 64% after inflation between the years 2006 and 2018. This resulted in an increase of 7% in spending per student. Conversely, other regional groupings under the SDGs witnessed a decline in spending per student during the 2006 - 2018 period (Williams & Usher 2022).

1.4 Challenges faced in achieving UIC for sustainable development

The UIC is achieved with challenges including lack of funding by governments and private sectors. Research shows that a 15% of GDP in revenue is needed to fund basic needs but in 30 of the 75 poorest nations, revenues from tax are below this 15% threshold (OECD, 2018).

Notwithstanding the role HEIs play in the socio-economic development Sub-Saharan Africa (SSA) record low enrolment rates. In figure 4 Amin and Ntembe (2020) demonstrate the situation of enormously low enrolment in HEIs in SSA compared to other regions. Amin and Ntembe (2020) noted a less than 6% enrolment rate in SSA, while the world average is 26%. Efforts have been made which led to a rise in enrolment, but with an unexpected consequence, like increased unemployment rates due to the larger number of graduates entering the job market.

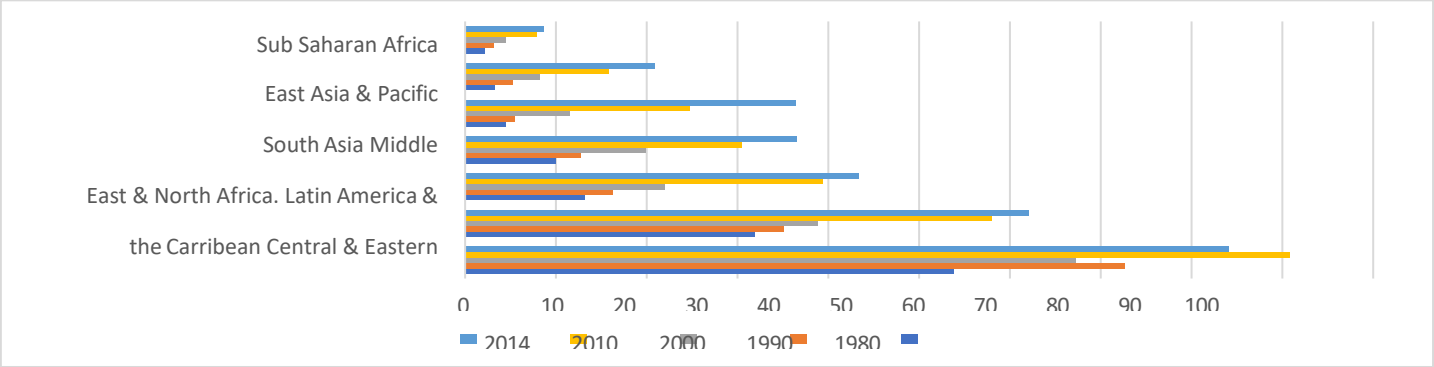

Figure 4. Higher education enrolment ratios by region

Source: Amin and Ntembe (2020)

In US, industry- university financing continues to be at low levels, and while there is high level of interest to build public-private partnerships, no promising results were achieved (Pourdeyhimi, 2021). Kim and Park (2018) indicated nine obstacles for securing university funding in Korea: (i) instability, (ii) limited overall allocation,(iii) redundant investments by the central government, (iv) inconsistency in program promotion goals, (v) ties to university structural reforms, (vi) imbalance in financial support targets, (vii) lack of transparency in financial support predictability, (viii) financial structures of private universities that rely heavily on tuition fees, and (viiii) various factors contributing to tuition increases. Berbegal-Mirabent et al. (2019) classified platforms that enhance collaboration between universities and industry into three primary types: education, crowdsourcing, and networking. The platforms enabled experiential learning, foster skill development, and stimulate the creation of innovative solutions to address industry needs.

2. METHODOLOGY/MATERIALS AND METHODS

2.1 Methods

An exploratory approach was adopted to enhance the researcher's understanding, and improve knowledge on funding for HE and the collaboration thereof with the industry. Qualitative elements of research were employed to answer the research question. These elements were quantified to enhance the understanding on the area of the study. The study utilised a secondary method to systematically review the literature on the role of tax revenues in funding higher education, particularly focusing on how this aligns with industry needs to promote

sustainable economic development.

2.2 Inclusion criteria

Research papers, journals, and articles published between 2017 and 2024 formed part of this study. These were obtained from the world wide web. The publications were identified and selected by titles, years of publications and abstracts sourced mainly from Google Scholar. Exclusion was applied if the article or a year suggested irrelevance to the study. After selection, a screening of abstracts and introductions was conducted to improve the robustness of the methods. The study followed the principles of consistency and transparency as drivers of quality in systematic literature reviews. Shah and Gillen (2023) identified the sources for review by following the systematic process of identifying key search terms and databases. Screening was made to ensure that the themes included in the study are relevant and aimed at answering the research question. Figure 5 depicts a flow chart of such screening.

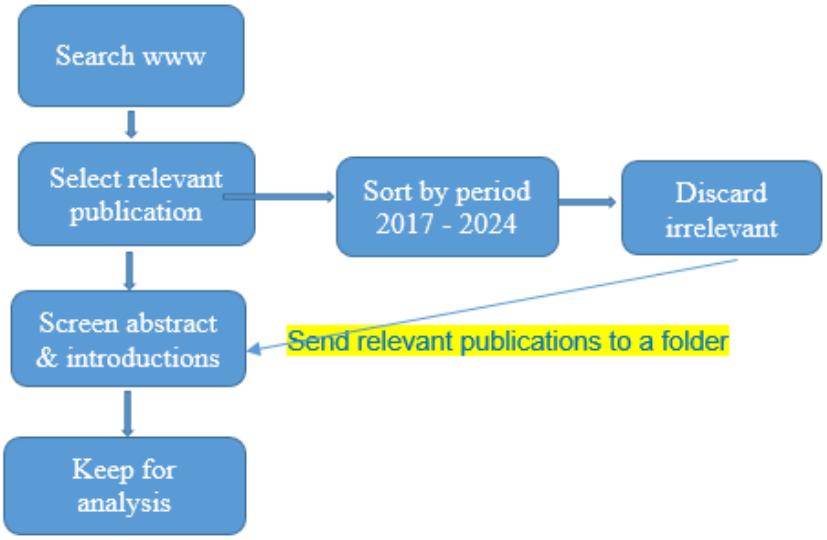

Figure 5. Publications Screening Flow Chart

Source: Researcher own construction (2024)

2.3 Analysis

A list of thirty-five (35) scholarly publications reviewed are shown in table 1. Related themes found are also listed in the same table. Some examples of the themes found were*: "through taxpayers"; "money to enhance IUC "; "financing higher education "; "government funding of universities"; "financial support for higher education"; investing in human capital"; "create UIC to enhance R&D"; "sustainable economic growth"*

The study identified overlapping and similar themes, and grouped them. Broader codes were assigned to categories that reflected the core ideas of the themes they contain. Further analysis was done by refining and meaningfully merging them. The processes resulted in five coded themes with meaningful definition to capture the richness of the data as shown in tables 2 and 3. The five major coded themes are related to the research question (what role tax revenue and public finance have in financing HE to meet industry needs and foster economic development).

Table 1. Articles reviewed and themes identified

Reviewed Publications	Identified themes
1. Williams, J., & Usher, A. (2022). 2022 World Higher Education: Institutions, students and funding. Higher	Public investment in higher education; Sustainable Development Goals

Education Strategy Associates. https://higheredstrategy.com/world-higher-education-institutions-students-and-funding/	
2. Fan, H., Huang, M., Chen, D. (2019). Do funding sources matter? The impact of university-industry collaboration funding sources on innovation performance of universities. *Technology Analysis and Strategic Management, 31*(2):1-13. https://doi.org/10.1080/09537325.2019.1614158#	State funding; university-industry collaboration (UIC); facilitated UIC; governmental funding
3. Ramli, S., Rasul, M. S., & Affandi, H. M. (2018). Sustainable Development: Needs of Green Skills in the Fourth Industrial Revolution (4IR). *International Journal of Academic Research in Business and Social Sciences*, *8*(9), 1082–1095. http://dx.doi.org/10.6007/IJARBSS/v8-i9/4682	Intergrading of green skills; promote sustainable growth
4. Pal, L.C. (2023) Impact of education on economic Development. *Khazanah Pendidikan Islam 5*(1):10-19. https://doi.org/0.15575/kp.v5i1.25199	Socio economic development; sustainable and economic progress; sustainable and inclusive growth
5. Nkwanyane, T. P. (2023). Understanding the Demand for Industrial skills through the National Certificate (Vocational) Building and Civil Engineering Programme. *International Journal of learning, teaching and educational research., 22*(5):674-687. http://doi.org/10.26803/ijlter.22.5.35	Providing industry align skills; promoting sustainable lives; meet the demand for industrial skills
6. Indrawati, S. M. & Kuncoro, A. (2021). Improving competitiveness through vocational and higher education: Indonesia's vision for Human Capital Development in 2019–2024. *Bulletin of Indonesian Economic Studies*, (57)1, 29-59. https://doi.org/10.1080/00074918.2021.1909692	Adapt to digital changes; emphasise appropriate digital skills
7. Limbo, N. (2020). On Sustainable Funding and the Reform of Higher Education. https://www.namibian.com.na/on-sustainable-funding-and-the-reform-of-higher-education/	Investment in higher education; leverage the Fourth Industrial Revolution; government grants' funding; funding higher education
8. Leišytė, L. Rose, A. & Sterk-Zeeman, N. (2022). Higher education policies and interdisciplinarity in Germany. *Tertiary Education and Management,* 28, 353–370. https://doi.org/10.1007/s11233-022-09110-x	State dominated funding; funding of public HEIs; multi- and interdisciplinary knowledge
9. MSM Reporter Bureau (2024). US grants $44.5 million to 22 higher education institutions. https://msmreporter.com/us-grants-44-5-million-to-22-higher-education-institutions/	Meet industry demand; in-demand industry; aligned with high-demand industries
10. Bégin- Caouette, O. (2017). Public research funding streams and the perspective of system actors. https://era.ideasoneurope.eu/2017/12/04/public-research-funding-streams-perspective-system-acto	Increase public funds; funding streams; public research funding
11. UNESCO (2021). Argentina, financing for equity. Global education monitoring report. Retrieved from: https://education-profiles.org/latin-america-and-the-caribbean/argentina/~financing-for-equity	Federal tax revenue; financing the national education; skills required by the job market
12. Hryhorash, O., Chentsov, V., Nurgaliyeva, A. & Hryhorash, T. (2020). State funding of higher education as a factor of ensuring its quality: experience of the European countries. *Public and Municipal Finance*, *9*(1), 60-69. http://dx.doi.org/10.21511/pmf.09(1).2020.06	Financing training; training of specialists; supply staff for industry
13. Berbegal-Mirabent, J., Dolors Gil-Doménech, D. Ribeiro-Soriano, D.E. (2019). Fostering university-industry collaborations through university teaching. *Knowledge Management Research & Practice, 18*(1)1-13. https://doi.org/10.1080/14778238.2019.1638738	Collaborative platforms; meet industry needs
14. Pereverzeva Y.V. & Shamne A. N. (2017). Financing higher education: experience of Russia and Germany. *Advances in*	

Social Science, Education and Humanities Research (ASSEHR), 97. https://doi.org/10.2991/cildiah-17.2017.38	Financing HE; government funding of universities
15. Wuttaphan, N. (2017). Human capital theory: The theory of human resource development, implications, and future. *Life Sciences and Environment Journal*, *18*(2), 240–253. https://ph01.tci-thaijo.org/index.php/psru/article/view/76477	Invest in human capital; sustainability in the complex business; knowledge-based economy,
16. Sanchez-Carrillo et al., 2021. Embracing higher education leadership in sustainability: A systematic review. *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2021.126675#	Improve education levels; Sustainable Development Goals; investments in education and training; increase the productivity and efficiency of individuals;
17. Shah, R., & Gillen, A. L. (2023). A systematic literature review of university-industry partnerships in engineering education. *European Journal of Engineering Education, 49*(3), 577–603. https://doi.org/10.1080/03043797.2023.2253741	University-industry partnership; university industry collaboration
18. Bandara S. (2023). Relationship between higher education and economic development: evidence from West Virginia. *The International Journal of Business and Finance Research, 17*(1) 93-104.	Investment in education; education that generates skilled labor force
19. Yue, Y. (2023). From Macro- to Micro-: China's expectations from the 2030 agenda for sustainable development of higher education and its influence on STEM english reforms https://doi.org/10.17673/vsgtu-pps.2023.1.1	Sustainable development; talents for global competency
20. Wasiaturrahma, N. Chairunissa (2022). Endogenous growth factors in four categories of countries based on Human Development Index. 11(3) 567-583. https://www.journal.unrika.ac.id/index.php/jurnaldms/article/view/4758	Objective of sustainable development (SD; Sustainable Development Goals
21. Abatau, N. (2021). The financing of higher education in different countries: a short analysis. *Journal of International Business Research, 20*(6), 1-3. https://www.abacademies.org/articles/the-financing-of-higher-education-in-different-countries-a-short-analysis.pdf	Through taxpayers' money; enhance IUC; financing higher education; government funding of universities; higher education financing; public-sector-funded; public contributions to higher education financing

22. NShi, L., Han, L. Yang, F., & Gao, L. (2019). The Evolution of Sustainable Development Theory: Types, Goals, and Research Prospects. *Sustainability Journal, 11*(24), 7158. https://doi.org/10.3390/su11247158	Sustainable development (SD); sustainable development paths; Sustainable Development Goals (SDGs); SD types and goals
23. Cai, Y. & Etzkowitz, H. (2020). Theorising the Triple Helix Model: past, present, and future. *Triple Helix Model Journal,* 27. https://doi.org/ 10.1163/21971927-bja10003	Skills and competencies; needed for children to thrive in the 21st century

24. UNDP (2023). How do taxes drive the Sustainable Development Goals? https://www.undp.org/blog/how-do-taxes-drive-sustainable-development-goals	Tax revenue; Sustainable Development Goals (SDGs); tax for SDGs; tax for SDGs initiative; sustainable growth strategies;
25. Xing, B.& Marwala, T. (2017). implications of the Fourth Industrial Age on Higher Education. *The Thinker*, 73, 1-9. https://doi.org/10.25073/0866-773X/87	Skills, knowledge and competencies required, in the 4IR era; funding for training
26. Yue, Y. (2023). From Macro- to Micro-: China's expectations from the 2030 agenda for sustainable development of higher education and its influence on STEM english reforms. https://doi.org/10.17673/vsgtu-pps.2023.1.1	Sustainable development; talent with global competent; agenda for Sustainable Development; sustainable development; Sustainable Development Goal 4
27. Amin, A.A. & Ntembe, A. (2020). Sub-Sahara Africa's Higher Education: Financing, Growth, and Employment. *International Journal of Higher Education,* 10 (1). https://doi.org/10.5430/ijhe.v10n1p14	Government expenditures on higher; investing in higher education
28. Pourdeyhimi, B. (2021). University research funding: Why does industry funding continue to be a small portion of university research, and how can we change the paradigm? *Industry and Higher Education, 35*(3), 150–158. https://doi.org/10.1177/0950422220962286	University financing; build public-private partnerships; interactions between industry and academia
29. Kim, B. & Park, N. (2018). Lessons learned from financing universal higher education in Korea. *International Journal of Educational Development, 58* (1), 116-127. https://doi.org/10.1016/j.ijedudev.2017.09.010	Financial support for higher education; securing financial support; financing HE; education financing
30. Ho, T.T., Tran X.H., Nguyen Q. K. (2022). Tax revenue-economic growth relationship and the role of trade openness in developing countries.10(2). https://doi.org/10.1080/23311975.2023.2213959	Tax revenue; increasing tax revenue
31. Berbegal-Mirabent, J. , Dolors Gil-Doménech, D. , Ribeiro-Soriano, D.E. (2019). Fostering university-industry collaborations through university teaching. *Knowledge Management Research & Practice 18*(1)1-13. https://doi.org/10.1080/14778238.2019.1638738	University-industry links; bring university and industry together; meet industry needs
32. Paleka, H. & Radić, M. N.(2020).Higher Education Funding and Economic Growth: Empirical Evidence from Croatia. *Scientific Annals of Economics and Business, 67*(3):409-421. https://doi.org/10.47743/saeb-2020-0021	UIC to enhance; sustainable economic growth; sustainable economic growth and development; sustainable economic growth factor; sustainable and inclusive growth

33. Zhang, Y., & Chen, X. (2023). Empirical Analysis of University–Industry Collaboration in Postgraduate Education: A Case Study of Chinese Universities of Applied Sciences. Sustainability, 15(7), 6252. https://doi.org/10.3390/su15076252	Meeting the needs of industry university–industry collaboration; improve their employability
34. Gouëdard, P. Pont B., Hyttinen, S. & Huang, P. (2020). Curriculum reform: A literature review to support effective implementation, OECD Education Working Papers 239. https://doi.org/10.1787/efe8a48c-en	; Skills and competencies that are needed
35. Adepoju T. L. & Okotoni C. A. (2018). Higher Education, Knowledge Economy and Sustainable Development in Nigeria. Journal of Education and Practice, 9(18). https://core.ac.uk/download/pdf/234641767.pdf	Quality of generated knowledge; relevant manpower training; sustainable development; Sustainable national capacity development.

Source: Researcher own construction (2024)

The study identified five key themes that were most frequently discussed in the reviewed literature, which are outlined and coded as follows:

Industry-University Collaboration (IUC) refers to a partnership between businesses (industry) and academic institutions (universities) aimed at leveraging their respective strengths to achieve common goals. This collaboration can take various forms, including R&D, innovation and commercialisation, training and workforce development, infrastructure sharing, and problem solving.

Sustainable development (SD) refers to a mode of human development where resource use aims to meet human needs while ensuring the sustainability of natural systems and the environment, so that these needs can be met not only in the present, but also for future generations. The concept encompasses three main pillars: economic sustainability, environmental sustainability, and social sustainability.

Public and Tax Funding (PTF) entails the financial support provided by the government to institutions of higher learning, such as universities and colleges. This funding is typically sourced from taxpayers and can be allocated in various forms.

Higher Education Funding (HEF) is crucial for maintaining the quality of education, supporting research and innovation, and providing access to education for a diverse student population. Revenue generated from students' tuition and fees is a significant source of funding for many institutions. Other sources are direct funding (grants, subsidies) and indirect funding (tax incentives, scholarships)

Industry Needs (IN) are defined in terms of skills that vary widely depending on the sector, but several key trends and common requirements are prevalent across many fields, which include: technical, soft, emerging (green and sustainability), and industry-specific skills.

2.4 Results

Table 2 presents the thematic framework developed in the study, outlining five key themes along with corresponding examples. A total of 104 themes were identified, with 29 related to IN and 25 to HEF. The least identified themes, totaling 14, pertain to the concept of IUC, while 17 and 19 themes correspond to PTF and SD, respectively. The hierarchical distribution of these themes is further quantified in table 3. The study aimed to enhance understanding and address the research question on the role of taxation and public funding in financing higher education to meet industry demands and drive sustainable economic development. Although some

concepts, such as IUC, were found to be discussed less frequently, their significance in economic development remains vital.

Table 2: Thematic Framework of the study

Themes	Themes numbers	Instances
Industry University Collaboration **(IUC)**	14	*"government-industry-university collaboration", "industry university collaboration", "collaboration platforms", "expedite iuc", "university and industry together"*
Sustainable Development **(SD)**	19	*Sustainable Development Goals (SDGs) "enhance economic growth", "development to all, "socio-economic development", "advance economies"*
Public and Tax Funding **(PTF)**	17	*"through taxpayer money, "public funding", "tax revenue to education financing", "public and private funds for research", "government funding of universities"*
High Education Financing **(HEF)**	25	*"financial support for higher education", "finance higher education", "supporting higher education", "higher learning institution funding"*
Industry Needs **(IN)**	29	*"skills and competencies that are needed", "skills and competencies needed in 20th century", "meet industry needs", "meet industry demand", "enhance human capital for fourth industrial revolution"*

Source: Researcher own constructed (2024)

Themes and their frequency counts are depicted in table 3 with dominant theme *IN* (28%) as the most frequently discussed theme, indicating that stakeholders highly prioritize aligning education or research with the practical needs of industry. The HEF at 24% is a close second concern. implies participants concerns with how education is funded. The next theme is SD at 18% reflecting the importance of integrating environmental and social sustainability into academic or industrial strategies. PTF theme stands at 16% indicating awareness or concern about how public funds and taxation are being used to support education or industry partnerships. The last theme IUC at 14% while the least frequent, this theme still appears significantly. suggests interest in collaboration between academia and industry for innovation, research, or student training.

Table 3: Themes and their frequency counts

Concepts	Number of themes	%
	29	28

Industry Needs **(IN)**		
High Education Financing **(HEF)**	25	24
Sustainable Development **(SD)**	19	18
Public and Tax Funding **(PTF)**	17	16
Industrial University Collaboration **(IUC)**	14	14

Source: Researcher own constructed (2024)

2.5 Discussions and Implications

This section interprets the study's findings in relation to the research questions, literature review, and relevant theoretical perspectives concerning the nexus between higher education and industry. It draws meaningful insights from the data to understand how tax revenue allocation influences higher education funding, and how such funding, in turn, affects the dynamics of industry collaboration and sustainable economic development. The interpretation also considers how the strategic alignment between academia and industry can foster innovation, skills development, and job creation ultimately contributing to national development goals.

To anchor these relationships, a conceptual framework is employed, serving as a structured representation of the key concepts, variables, and their interrelationships within the study. This framework not only clarifies the study's theoretical foundation but also provides a visual and systematic approach to understanding the mechanisms through which tax policies and funding priorities shape the higher education sector's responsiveness to industry needs.

Figure 6 illustrates this conceptual framework, presenting a visual representation of the interconnectedness between tax revenue allocation, higher education funding, industry collaboration, and sustainable economic development. It highlights the cyclical nature of these elements, demonstrating how increased tax revenue when strategically allocated can enhance educational infrastructure and research capabilities, thereby strengthening industry partnerships and promoting long-term economic resilience. The figure emphasizes the feedback loops and synergies that arise when education and industry are integrated through well-informed fiscal policies and cooperative initiatives, ultimately driving innovation and inclusive growth.

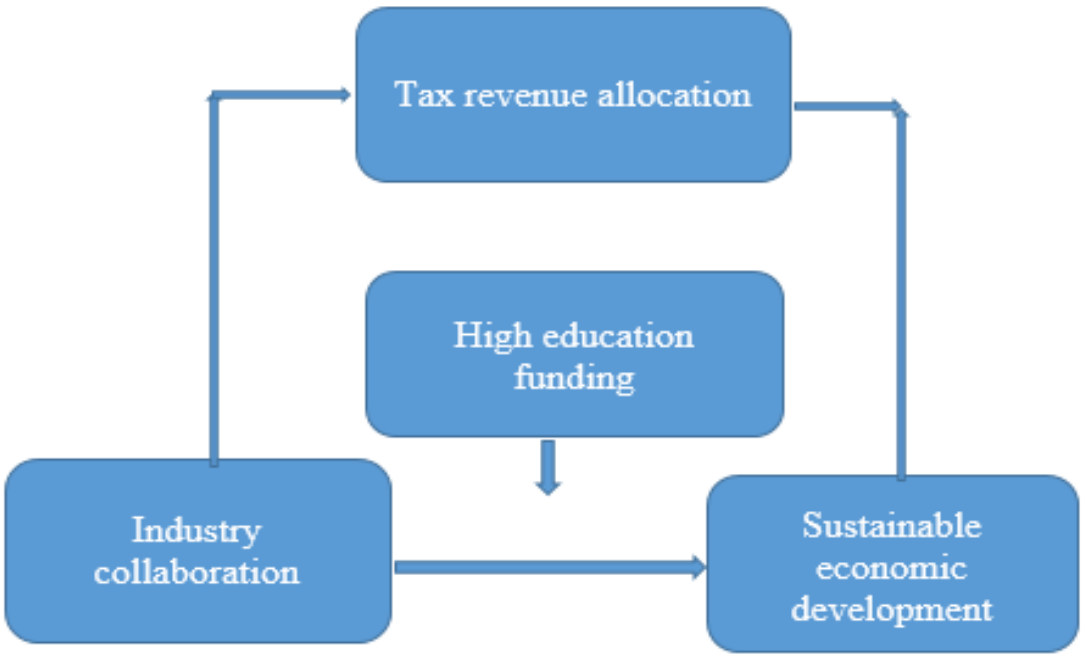

Figure 6: Conceptual framework of the study

Source: Researcher own construction

This interconnected approach ensures that tax revenue fosters sustainable development by bridging education, industry needs, and economic growth.

The findings show that the allocation of tax revenue to higher education funding improves access, quality, and research output. Insufficient funding may lead to skills shortages, hindering economic growth. Partnerships between higher education institutions and industries is said to ensure relevant skills development. Tax incentives for R&D encourage private-sector investment in education. The study also established that a well-funded education system produces a skilled workforce, driving innovation and productivity. Industry-driven education programs enhance employability and entrepreneurship, reducing reliance on government support. Policy reforms should be effected where necessary to assist governments directing tax revenue effectively to education to boost economic competitiveness. Public-Private Partnerships would create stronger collaboration between industries and universities that can align education with market needs. Investing in higher education via tax revenue could enhance a self-sustaining cycle of innovation, job creation, and economic resilience. Businesses may be more willing to comply with tax laws if they see tangible benefits from public investments in education and workforce development.

2.6 Conclusions and Recommendations

A well-integrated approach to tax policy, education funding, and industry collaboration enables governments to drive sustainable economic development and build a resilient, knowledge-based economy. Investing tax revenues in higher education is essential for ensuring long-term development sustainability. Publicly funded higher education contributes to economic growth and sustainable development by fostering a more skilled workforce and promoting innovation. Aligning tax and public funding for higher education with industry needs is crucial to balancing economic progress with social equity and environmental sustainability. Therefore, the study recommends that both the public and private sectors collaborate in funding higher education institutions (HEIs) and research and development (R&D) to create programs that effectively address the demands of the current and future industrial landscape, fostering sustainable development for all nations. Future studies are recommended to monitor the attainment of the 17 Sustainable Development Goals (SDGs) depicted in figure 7.

Figure 7: 17 Sustainable Development Goals

Adopted from: European Union (2023)

Attainment of SDGs is a crucial call to all nations, both developed and developing to collaborate in a global partnership. Tax revenue is the primary domestic resource for financing education, healthcare, infrastructure, and social welfare, which are central to SDGs. Monitoring SDGs attainment helps assess whether tax policies

effectively allocate resources to key areas such as poverty reduction (SDG 1), quality education (SDG 4), and industry innovation (SDG 9).

References

Abatau, N. (2021). The financing of higher education in different countries: a short analysis. Journal of International Business Research, 20(6), 1-3.https://www.abacademies.org/articles/the-financing-of-higher-education-in-different-countries-a-short-analysis.pdf

Amin, A.A. & Ntembe, A. (2020). Sub-Sahara Africa's Higher Education: Financing, Growth, and Employment. *International Journal of Higher Education, 10*(1). https://doi.org/10.5430/ijhe.v10n1p14

Bandara S. (2023). Relationship between higher education and economic development: evidence from West Virginia. The International Journal of Business and Finance Research, 17(1) 93-104.Bégin- Caouette, O. (2017). Public research funding streams and the perspective of system actors. https://era.ideasoneurope.eu/2017/12/04/public-research-funding-streams-perspective-system-acto pp. 44-51. https://doi.org/10.37788/2021-3/44-51

Berbegal-Mirabent, J. , Dolors Gil-Doménech, D. , Ribeiro-Soriano, D.E. (2019). Fostering university-industry collaborations through university teaching. *Knowledge Management Research & Practice, 18*(1)1-13. https://doi.org/10.1080/14778238.2019.1638738

Bezdek, R. (2019). The hydrogen economy and jobs of the future. Renewable Energy and Environmental Sustainability, 4 (1). https://doi.org/10.1051/rees/2018005

Cai, Y. & Etzkowitz, H. (2020). Theorizing the Triple Helix Model: past, present, and future. Triple Helix Model Journal 27. https://doi.org/ 10.1163/21971927-bja10003

Fan, H., Huang, M., Chen, D.(2019). Do funding sources matter? The impact of university-industry collaboration funding sources on innovation performance of universities. *Technology Analysis and Strategic Management, 31*(2):1-13. https://doi.org/10.1080/09537325.2019.1614158#

Figueredo, N. & Cristina Fernandes, C. (2021). Cooperation University–Industry: A Systematic Literature Review. *International Journal of Innovation and Technology Management*, 17(08). https://doi.org/10.1142/S0219877021300019

Gouëdard, P. Pont B., Hyttinen, S. & Huang, P. (2020). Curriculum reform: A literature review to support effective implementation, OECD Education Working Papers 239. https://doi.org/10.1787/efe8a48c-en

Hannah, E., O'Hare, B., Lopez, M., Murray, S., Etter-Phoya, R., Hall, S., Masiya, M. (2023). How can corporate taxes contribute to sub-Saharan Africa's Sustainable Development Goals (SDGs)? A case study of Vodafone. *Global Health,* 19(1). https://doi.org/10.1186/s12992-022-00894-6.

Ho, T.T., Tran X.H., Nguyen Q. K. (2022). Tax revenue-economic growth relationship and the role of trade openness in developing countries.10(2). https://doi.org/10.1080/23311975.2023.2213959

Hryhorash, O., Chentsov, V., Nurgaliyeva, A. & Hryhorash, T. (2020). State funding of higher education as a factor of ensuring its quality: experience of the European countries. *Public and Municipal Finance, 9*(1), 60-69. http://dx.doi.org/10.21511/pmf.09(1).2020.06

Indrawati, S. M. & Kuncoro, A. (2021). Improving competitiveness through vocational and higher education: Indonesia's vision for Human Capital Development in 2019–2024. Bulletin of Indonesian Economic Studies, (57)1, 29-59. https://doi.org/10.1080/00074918.2021.1909692

Kim, B. & Park, N. (2018). Lessons learned from financing universal higher education in Korea. *International Journal of Educational Development 58* (1), 116-127. https://doi.org/10.1016/j.ijedudev.2017.09.010

Leišytė, L. Rose, A. & Sterk-Zeeman, N. (2022). Higher education policies and interdisciplinarity in Germany. *Tertiary Education and Management*, 28, 353–370. https://doi.org/10.1007/s11233-022-09110-x

Limbo, N. (2020). On Sustainable Funding and the Reform of Higher Education. https://www.namibian.com.na/on-sustainable-funding-and-the-reform-of-higher-education/

MSM News Service Reporter Bureau. (2024, Month Day). *US grants $44.5 million to 22 higher education institutions*. MSM News Service. https://msmreporter.com/us-grants-44-5-million-to-22-higher-education-institutions/

Nkwanyane, T. P. (2023). Understanding the Demand for Industrial skills through the National Certificate (Vocational)Building and Civil Engineering Programme. *International Journal of learning, teaching and educational research., 22*(5):674-687. http://doi.org/10.26803/ijlter.22.5.35

Pal, L.C. (2023) Impact of education on economic Development. Khazanah Pendidikan Islam. 5(1):10-19. https://doi.org/0.15575/kp.v5i1.25199

Paleka, H. & Radić, M. N.(2020).Higher Education Funding and Economic Growth: Empirical Evidence from Croatia. *Scientific Annals of Economics and Business*, *67*(3),409-421**.** https://doi.org/10.47743/saeb-2020-0021

Pereverzeva Y.V. & Shamne A. N. (2017). Financing higher education: experience of Russia and Germany. *Advances in Social Science, Education and Humanities Research (ASSEHR), 97*. https://doi.org/10.2991/cildiah-17.2017.38

Pourdeyhimi, B. (2021). University research funding: Why does industry funding continue to be a small portion of university research, and how can we change the paradigm? *Industry and Higher Education, 35*(3), 150–158. https://doi.org/10.1177/0950422220962286

Ramli, S., Rasul, M. S., & Affandi, H. M. (2018). Sustainable Development: Needs of Green Skills in the Fourth Industrial Revolution (4IR). *International Journal of Academic Research in Business and Social Sciences, 8*(9), 1082–1095. http://dx.doi.org/10.6007/IJARBSS/v8-i9/4682

Sanchez-Carrillo, J.C.; Cadarso, M.A.; Tobarra, M.A. (2021). Embracing higher education leadership in sustainability: A systematic review. Journal of Cleaner Production. https://doi.org/10.1016/j.jclepro.2021.126675#

Shah, R., & Gillen, A. L. (2023). A systematic literature review of university-industry partnerships in engineering education. *European Journal of Engineering Education, 49*(3),577–603. https://doi.org/10.1080/03043797.2023.2253741

UNESCO (2021). Argentina, financing for equity. Global education monitoring report. https://education-profiles.org/latin-america-and-the-caribbean/argentina/~financing-for-equity

Williams, J., & Usher, A. (2022). 2022 World Higher Education: Institutions, students and funding. Higher Education Strategy Associates. https://higheredstrategy.com/world-higher-education-institutions-students-and-funding/

Wuttaphan, N. (2017). Human cspital theory: The theory of human resource development, implications, and

future. *Life Sciences and Environment Journal, 18*(2), 240–253. https://ph01.tci-thaijo.org/index.php/psru/article/view/76477

Xing. B., & Marwala, T. (2017). Implications of the Fourth Industrial Age on Higher Education. *The Thinker* ,73, 1-9. https://doi.org/10.25073/0866-773X/87

Zakaria, H., Kamarudin, D., Fauzi M. A., & Wider, W. (2023). Mapping the helix model of innovation influence on education: A bibliometric review. 8 https://doi.org/10.3389/feduc.2023.1142502

Zhang, Y., & Chen, X. (2023). Empirical Analysis of University–Industry Collaboration in Postgraduate Education: A Case Study of Chinese Universities of Applied Sciences. *Sustainability, 15*(7), 6252. https://doi.org/10.3390/su15076252

Yue, Y. (2023). From Macro- to Micro-: China's expectations from the 2030 agenda for sustainable development of higher education and its influence on STEM english reforms https://doi.org/10.17673/vsgtu-pps.2023.1.1