ADAPTING TO CHANGE IN THE MODERN WORLD: SKILLS DEVELOPMENT IN HIGHER EDUCATION FOR ECONOMIC AND SUSTAINABILITY ISSUES

A. MUSTAFAZADA

Ayshan Mustafazada
Azerbaijan University of Languages, Azerbaijan
https://orcid.org/0009-0004-6687-7400, E-mail: ayshan.mustafazada@adu.edu.az

Abstract: The capacity to adapt to change is critical for both individual achievement and societal growth in the quickly changing global scene of today. This study investigates how higher education can provide students with the tools they need to successfully handle difficulties related to sustainability and the economy. Utilizing multidisciplinary viewpoints from the fields of education, economics and environmental studies, this research delves into the tactics and methods used by universities to cultivate flexibility and fortitude in their students. This research attempts to uncover critical competencies and pedagogical strategies that support skill development for solving complex economic and sustainability concerns by looking at case studies and best practices from different educational environments. This research also examines the relationship between environmental sustainability and economic growth, highlighting the value of holistic methods in the creation of curricula for higher education. In the end, this study adds to the continuing conversation about the role of higher education in equipping students to prosper in a changing, globally interconnected world where sustainability and adaptation are essential to long-term success and the welfare of society. Additionally, this article emphasizes the significance of acquiring 21st-century skills for success in the contemporary workforce, including as critical thinking, creativity, cooperation, communication, and technological literacy. In order to successfully solve economic and environmental concerns, the research ends with recommendations for enhancing programmes for skill development, funding faculty development, encouraging multidisciplinary collaboration, and interacting with stakeholders.

Keywords: Higher education, sustainability, economic growth, pedagogical strategies

INTRODUCTION

Rapid technology breakthroughs, economic transformations, and environmental issues require higher education to take a proactive approach to skill development in light of the ever-changing modern world. Formerly focused only on academic information acquisition, the traditional model of higher education today has to provide students with the adaptable skill sets needed to deal with changing economic and sustainability issues. This introduction explores the vital role that higher education institutions play in helping students develop resilience and flexibility so they are ready to flourish in a world where change is a constant.

The economic landscape has changed dramatically as a result of globalisation, automation, and the creation of new industries. This has brought about both opportunities and challenges. Higher education establishments must therefore place a significant priority on developing abilities like critical thinking, problem-solving, entrepreneurship, and adaptability. In addition to making graduates more employable, these abilities enable them to spur economic growth, foster innovation, and negotiate the uncertainties of a labour market that is changing quickly.

Stronger ties between academia and business are clearly advantageous to both parties, unless it takes up time that a professor should be using to assist students. While working with businesses is "the third task" for universities in the Nordic region, many of these institutions do not charge tuition; yet government financing for these institutions ranges from 20% to 35% (Bridgestock, 2021). The government of Japan separated HEIs into multiple groups and gave the instructions on how to locate their own revenue streams (Destination Guides, 2021). In many nations, HEIs are becoming increasingly distinct from one another as a result of their uneven success in these endeavours. Furthermore, a number of knowledgeable observers assert that even with better didactics, the declining quality of instruction cannot be entirely offset.

Another difficulty facing HEIs is how to integrate the Sustainable Development Goals (SDGs) into their institutional, scientific, and pedagogical processes on a worldwide scale. The majority of the world's top institutions compete in Times Higher Education THE's Impact Ranking (Impact Rankings, 2021), which indicates how closely they adhere to the SDGs, which were endorsed by all UN members in 2015. A total of 767 institutions from 86 countries took part in the 2019 THE ranking; nevertheless, 82% of them are located in high-income nations.

These changes suggest that higher education is becoming increasingly cognizant of the consequences of contemporary, post-industrial society in academia. The 21st century demands a completely distinct knowledge base abs skill set due to its intensity and complexity, which includes understanding the sociopsychological characteristics of young people who are preparing to enter the workforce. A university cannot meet the highest scientific standards on its own. Regardless of the precise responsibilities they will play in society or the economy, they are now expected to be able and motivated to instil in young people the ideals of sustainable development and a feeling of social responsibility. Regretfully, not many governments recognise the need for constant assistance and sufficient financing for this.

In conclusion, the necessity of developing new abilities in higher education is highlighted by the need to adjust to change in the current world. Institutions may empower students to flourish in a fast-changing global world by providing them with the varied skills necessary to address sustainability and economic challenges. This investigation will focus on different approaches and top techniques for incorporating skill development into curricula in higher education, with the ultimate goal of producing a new breed of knowledgeable, flexible and conscious leaders.

Higher Education and Sustainability

Higher education establishments play a pivotal role in propelling social and economic advancement by moulding the cognizance, competencies, and principles of forthcoming generations. The relationship between sustainability and higher education has gained more

attention in recent years. More and more people are calling for higher education to take the lead in tackling urgent global concerns including social injustice, resource depletion, and climate change.

Academic institutions have a pivotal function in advancing sustainability via many approaches such as curriculum development, campus management, research endeavours, and community involvement.

- *Curriculum Integration:* A lot of colleges include sustainability concepts in all areas of their curricula. Regardless of their major, this integration guarantees that students are exposed to ideas like social responsibility, renewable energy, sustainable development, and environmental science. Higher education institutions teach students to become environmentally conscious professionals prepared to face sustainability concerns in their particular industries by offering courses, minors, or majors focused on sustainability.

- *Research and Innovation:* Universities carry out research to expand understanding and provide novel approaches to sustainability problems. Numerous academic fields are covered by this research, including engineering, economics, sociology, environmental science, and public policy. Universities frequently create sustainability-focused research centres or institutes to promote multidisciplinary collaboration and provide funding for significant studies that tackle urgent environmental issues.

- *Campus Sustainability Initiatives:* A lot of colleges integrate sustainability practices into their internal infrastructure and operations. Energy-efficient building designs, renewable energy installations, trash reduction and recycling programmes, water conservation techniques, environmentally friendly transportation alternatives, and sustainable procurement methods are a few examples of these activities. Higher education institutions show their dedication to environmental stewardship and give students real-world examples of sustainability in action by implementing sustainable practices on campus.

- *Outreach & Community Engagement:* In order to enhance sustainability and solve regional environmental issues, higher education institutions interact with the communities in which they operate. In order to design and carry out sustainability projects, initiatives, and outreach programmes, this involvement may entail collaborations with regional administrations, companies, nonprofits, and community organisations. Universities can help create more resilient and sustainable communities while giving students chances for hands-on learning and civic participation through community involvement.

- *Accountability for Sustainability:* To monitor and disseminate their progress towards environmental, social, and economic sustainability objectives, several colleges provide sustainability reports. Data on energy use, greenhouse gas emissions, waste production and diversion, water use, sustainable transportation choices, sustainable procurement methods, and social responsibility programmes are usually included in these reports. Higher education institutions show their stakeholders that they are accountable to them

and work to continuously improve their sustainability practices by being open and honest about their sustainability performance.

Higher education institutions, in general, are essential to the advancement of sustainability because they train the next generation of leaders, carry out research, adopt sustainable practices on campus, interact with the community, and encourage responsibility and openness in sustainability initiatives. By means of these diverse channels, academic institutions aid in moulding a future that is both egalitarian and environmentally friendly.

Higher Education and Twenty-First Century Skills

Companies' contributions to society need to shift fundamentally and permanently as a result of the post-COVID and climate change reality. In order to effectively address the need for action on a sustainable, human-centric, and resilient European industry, leaders must possess the abilities to consider, comprehend, and act in the company's and society's long-term best interests as well as to fit within the current but also the foreseeable EU policy frameworks (Cooke, 2012).

The skills and abilities required by the current labour market heavily dominate themes covered later in school, and the reasons for this include the rising pace and breadth of change. It is widely acknowledged that compared to many other countries, the Nordic countries have embraced this issue earlier and more easily.

Employers pay graduates based on jobs, which are essentially determined by the sort of formal degree, and students are driven to get formal degrees even if they do not always indicate a set of abilities and skills. This is the primary issue that most European nations face. While this serves a very different social purpose—that of training the future elite in a society where the majority of people lack literacy—it is related to the idea of a traditional university.

A large portion of the workforce in higher education still operates under the outdated belief that they can only truly succeed as long as they impart to their students the greatest knowledge possible in their field. They pay little attention to the competencies and skills that employers will need in the labour market of the future. The majority of European nations continue to face serious challenges as a result of these discrepancies between the labour market needs and the actual competences of graduates (not so much in Scandinavia, in the US, and numerous Asian countries). Far too many university instructors are not receiving the help and encouragement they need to modernise their teaching methods. This is seen as their duty, which aligns with another antiquated method of treating every topic rigorously independently and providing little room for interdisciplinary and intersubject viewpoints and actions. The majority of institutions' curriculum and programmes on certain subjects serve as excellent examples of this. The OECD (OECD Future of Education, 2021) has created a global skills strategy, refocusing its attention from traditional higher education tracks to lifelong learning and skills retained throughout the lifetime. This is due to the organization's recognition of the intricacy of skills policies as well as the possibility for peer learning.

Let us emphasise that the leadership of universities and their departments, as well as the relevant authorities, are involved in this issue. The first stage is to assess what the appropriate government agencies and their policies should be doing, as well as what colleges and academics themselves ought to be doing.

Nothing in the extensive education literature refers to, say, the «20th-century skills» because of the greater changes that have occurred in the 21st century as opposed to previous centuries. What are the 21st-century abilities that are necessary in today's technologically and socially advanced world and that must be gained through both lifelong learning and formal education, including university education? After reading a plethora of relevant material, we may choose to use Stauffer's (Stauffer,2021) summary, which consists of the twelve abilities and competences listed below, divided into three categories:

Learning skills: Critical thinking, Creativity, Collaboration, Communication. *Literacy skills:* Information literacy, Media literacy, Technology literacy. *Life skills:* Flexibility, Leadership, Initiative, Productivity, Social skills.

None of these abilities are brand-new, with the exception of digital literacy, but they have never been deemed necessary elements of a high-quality education. In the field of education science, they are now acknowledged as being very necessary for persons who wish to succeed in the modern workforce.

How will instructors help their pupils gain all these skills? is another important topic. To begin with, it is important to note that the professor or instructor was formerly highly esteemed based only on their position and academic standing. This is no longer the case; instead, students now need to sense the quality of their teachers and their desire to be welcomed due to their capacity to interact with them both in person and virtually.

The instructor must demonstrate a commensurate degree of proficiency in using digital tools to communicate with students online and search and share knowledge online in order to gain the respect and acceptance of the students. In the new technology era, students will consider their professors as senior partners, therefore only on this basis can a proper relationship be anticipated to grow. Without it, pupils will view teachers as learned individuals from a bygone era. This can lead to a big hole that would make it difficult to develop modern teaching methods or experiences.

Here are some beneficial proposals by a digital native, Professor T. Palmer, listing the significant characteristics of a high-quality 21st-century educator (Palmer,2021): Learner-centered classroom and personalized instruction, Students as producers, Learning new technologies, Going global, Smartly use of smartphones, Blog, Go digital, Collaborate, Use Twitter chats, Connect, Project-based learning, Build your positive digital footprint, Code, Innovate, Keep learning.

Creating and managing future scenarios and corporate foresight are generally not included in HEIs' curriculum or set as required courses for professional development pertaining to sustainable practices in organisations. Concurrently, corporate foresight has started to shift in recent years from being a tool for top management to a more inclusive stakeholder-driven approach. great levels of involvement, interaction, and immersion in hybrid techniques have demonstrated a great potential for increasing the number of stakeholders on board and advancing ownership of the deliverables.

The Economic and Social Roles of Higher Education

Competencies and skills are also essential in the continuous transition to a more sustainable economy. They are also necessary to foresee and address unforeseen outcomes of innovation. In order to create mid-range visions that serve as guidelines for cooperation, sustainability foresight competences necessitate the combination of empirical research skills with hermeneutic skills for the interpretation, contextualization, and evaluation of individual results. Rarely are these competences and skills taught in European HEIs (with a few notable exceptions in Finland, Germany, and France, for instance), (Adams, 2016).

Strategic sustainability foresight is a competence that is lacking in many European companies. Strategic foresight is a prerequisite for organisational integration, general strategic decision-making, and leadership and product/service level visioning. Businesses and students alike struggle to understand how to approach the task of working methodically with desirable and realistic green future possibilities (Adams, 2016).

Employers must implement significant and long-lasting reforms in response to the post-COVID and climate change reality. Here, skills and competences are essential to the continuous transition to a digital economy that is more robust, sustainable, and sustainable. They are also necessary to foresee and address unexpected repercussions of innovation (which is crucial for innovation focused on sustainability).

The current state of education in the majority of European nations falls short in the following areas:
* Methods to promote sustainability foresight independent of the specific area of interest; a step-by-step hybrid learning approach; and product/service design schools.
* Content and materials available for higher education establishments.
* Appropriate individuals to impart the knowledge.

The use of cutting-edge approaches in digital, hybrid, and human-centered education to facilitate involvement led by stakeholders or students (Adams, 2016).

It won't be enough to address social issues, neighbourhood projects, and measures aimed at lessening environmental damage and social unrest. In order to achieve shared value, developing innovative goods, services, and business strategies is insufficient (Adams, 2016) to have the net beneficial effect that business may have. Rather, this calls for creating a values-based organisational culture and managing innovation through procedures and approaches that blend action, foresight, and direction. Let me emphasize that a value-based strategy is essential to achieving sustainable development goals since shared values guarantee dedication and perseverance in achieving desired results.

In keeping with the above justifications, HEIs may help create the ideal future by carrying out the following actions:
- Establishing a group of exceptional professionals with crowdsourcing and sustainability vision to identify obstacles and best practices.
- Compile and evaluate complementary information, abilities, and techniques; identify important obstacles in the areas of innovation, sustainability, and local and national industry.
- Involve experts and practitioners in jointly developing specialised solutions to deal with the aforementioned problems.

- Create prototype solutions, which have to be tested and improved upon iteratively in collaboration with representatives of the industry partners who offer criticism and recommendations. Within the existing EU frameworks, such as Horizon Europe, Inter Reg, and other financing schemes, there are plenty of opportunity to develop new industrial solutions.

These arguments support the claim that, in order to ensure sustainable development and produce innovative skill sets, higher education needs to change to a multidisciplinary partnership with employers (industry) and policy communities at all levels. This shift is necessary in light of current economic and social trends. This claim may be used to inform recommendations for future studies on the trends and difficulties in higher education if the data from the current research are consistent with it. We conducted many bibliometric evaluations of the corpus of existing information to examine if the research patterns over the previous five years reflect our hypothesised path of higher education development in order to support such a notion and provide guidance for future empirical research. The analysis's foundation is:

- assessment of research trends, made possible by Elsevier SciVal, a scientometric tool that allows for the evaluation and benchmarking of research trends and performance based on Elsevier Scopus data;
- a thorough examination of bibliometric data pertaining to publications indexed by the Elsevier Scopus and Clarivate Web of Science (WoS), identified using the terms suggested, that describe the research trends in the body of existing literature about 21st-century skills, sustainability, and higher education.

METHODOLOGY

A high-level evaluation of research articles that may be related to 21st-century skills and the sustainability of higher education forms the foundation of empirical analysis. In this empirical investigation, we analysed an entire corpus of publications indexed by Elsevier Scopus that were related to the pertinent Sustainable Development Goals (SDGs) using the Elsevier SciVal scientometric tool. The prior five-year period, from 2016 to 2020, was the subject of the research.

We initially determined pertinent search phrases and keywords pertaining to sustainability, higher education, and 21st-century skills before conducting our research. Various concepts like "sustainability education," "21st-century skills," and "higher education" were among these keywords. Next, we searched the Elsevier Scopus database for publications published between 2016 and 2020 using these keywords.

Only peer-reviewed publications that directly related to the goals of the study were included in the search results. This required evaluating each article's title, abstract, and keywords to ascertain how relevant they were to the subjects of interest. The analysis did not include any articles that did not fit the criteria.

We performed a scientometric analysis of the corpus using the Elsevier SciVal tool after identifying the initial set of articles. This included analysing a range of measures and indicators to obtain insights into the state of research on sustainability and 21st-century skills in higher

education, including authorship patterns, publishing trends, and keyword co-occurrence networks.

Finding important topics, patterns, and trends within the corpus of articles was the main goal of the study. This involved figuring out which articles were the most often referenced, whose authors were the most productive, what the most popular study topics were, and whether there were any new areas of interest or disagreement in the field.

All things considered, the technique used a methodical strategy to locate and examine a large collection of research articles associated with the goals of the study. Through the use of the Elsevier SciVal tool, we were able to get important information on the current status of research concerning sustainability and 21st-century skills in higher education throughout the designated period.

RESULTS AND DISCUSSION

Our empirical strategy is doing a high-level examination of academic papers from the five years prior (i.e., the 2016–2020 timeframe), which have been identified as pertinent to our study proposal and linked to the pertinent SDGs. SDG 4 (Quality Education), SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action) are the broad topics of sustainability and the value of higher education for employers that we have mapped to.

Figures 1a–f, which also include the total number of published research items cited by Elsevier Scopus, demonstrate a rise in research interest in the chosen SDGs from 2016 to 2020. The fields of sustainable energy (Figure 1c), clean water (Figure 1b), climate change (Figure 1f), quality education (Figure 1a), sustainable consumption and production (Figure 1e), and sustainable cities and communities (Figure 1d) have the highest level of research interest among the pertinent SDGs.

Figure 1 (a)
Research output pertaining to SDG4 (210,989 total papers) from 2016 to 2020.
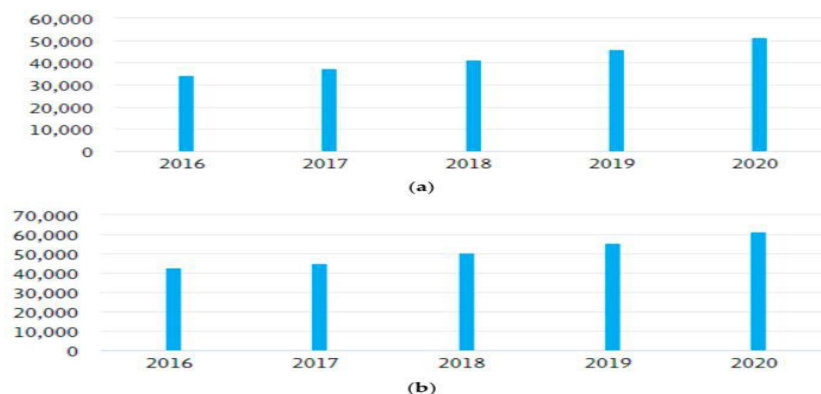
Figure 2 (b)
Research output pertaining to SDG4 (210,989 total papers) from 2016 to 2020

(a). Research output pertaining to SDG4 (210,989 total papers) from 2016 to 2020.
(b). Research output connected to SDG 6 from 2016 to 2020 (a total of 264,807 papers).
(c). Research output pertaining to SDG7 from 2016 to 2020 (731,457 total papers).
(d). Research output pertaining to SDG11 from 2016 to 2020 (336,506 total papers).
(e). Research output pertaining to SDG 12 from 2016 to 2020 (198,075 total papers).
(f). Research output pertaining to SDG13 from 2016 to 2020 (221,759 total papers).
Source: Elsevier SciVal.

Multidisciplinarity is the most noteworthy aspect of the results, as it aligns with the frequently discussed role of higher education in tackling the "wicked problems of the 21st century," such as sustainable development, innovation, and human capital production for the modern economy and society (Hensley,2021, Keep, 2014). To address these issues facing contemporary society, a multidisciplinary approach to research and transboundary education is necessary (Ramley,2014). This is particularly helpful in times of crisis, like the one the EU has experienced over the past five years, with the large influx of migrants [41], the economic difficulties brought on by COVID-19 (Zigman,2021), and other pertinent concerns. Table 2 provides an illustration of the multidisciplinarity of the examined study fields.

Table 2
Lists the top 25 WoS fields of study that are related to the study subject.

WoS Discipline/Category	WoS Record Count	% of 13.131 Records
Environmental Sciences	3042	23.167
Environmental Studies	1674	12.748
Education Educational Research	1632	12.429
Energy Fuels	996	7.585
Chemistry Multidisciplinary	906	6.900
Engineering Chemical	882	6.717
Engineering Environmental	838	6.382
Materials Science Multidisciplinary	724	5.514
Chemistry Physical	511	3.892
Plant Sciences	388	2.955
Multidisciplinary Sciences	362	2.757
Management	324	2.467
Biotechnology Applied Microbiology	300	2.285
Water Resources	291	2.216
Nanoscience Nanotechnology	251	1.912
Ecology	244	1.858
Agronomy	234	1.782
Forestry	234	1.782
Engineering Civil	233	1.774
Business	231	1.759
Physics Applied	231	1.759
Engineering Multidisciplinary	227	1.729
Construction Building Technology	212	1.615
Economics	201	1.531

Source: Clarivate Web of Science.

CONCLUSIONS

Ensuring sustainability remains a significant task of higher education and its institutions, which can be concluded based on the previously reported empirical results related to the extant literature, referred by WoS and Scopus indexing databases. However, a vast body of knowledge related to sustainability, its implementation, and the role of the higher education sector in ensuring sustainable development has put the empirical analysis of the 21st-century skills to be supplied by higher education institutions to the background. Nevertheless, this topic still deserves the full attention of scholars and policymakers alike.

As reported by the World Economic Forum, for the next four years, growth of 13.5% in emerging professions is expected—parallel to the decreasing fall of redundant jobs. Workers will have to acquire even 40%–50% of new skills during the next five years. Employers expect to offer reskilling and upskilling to 70% of their employees. This is creating an unprecedented challenge for everyone, including university teachers, who can contribute a lot but are often not sufficiently aware of the situation's urgency. The same can be said for the respective government departments, which is also applicable to students and the general public.

Moreover, various university rankings do not provide an objective insight into whether a country has developed an optimal university system. Excellence is certainly most welcome

and adds to the international prestige of the countries concerned. However, improving the general level of university teaching (i.e., its relevance and quality) is even more critical. This is reflected by the education policy of Nordic and some Baltic governments, not only on the higher education level which could further serve as a benchmark and inspiration to other European regions.

This is why the awareness among policy and the educational communities, the professional and general public, and the media of the critical importance of 21st-century skills to be developed during the entire education cycle, including higher education. This notion is confirmed by the bibliometric analysis, which we performed, to support the theoretical identification of the relevant trends in higher education. It confirms that the extant body of knowledge views the integration of the relevant business skills for the 21st century with the outlook and competencies of ensuring sustainable (industrial) development as a key to the further development of European society and the economy.

Some specific recommendations, which could be extended, both to the higher education administrators as well as to the education policy community, include:

- Promoting multidisciplinary education and research through finance and human resource management strategies rather than merely declaring a multidisciplinary approach.
- Putting a focus on stakeholder communication and promoting collaborative research across academic, business, and policy players.
- Interacting with students and getting their feedback on suggested changes and policies for higher education.

This also requires adequate and stable funding of higher education institutions, wherever it may come from. While 100% public funding might not be realistic in all European countries, governments and universities should cooperate in creating a system that secures the conditions for quality in teaching and research. Many countries have not yet found a reasonable university funding scheme to develop, encourage, and provide the best possible learning outcomes for the highest possible percentage of students to complete their studies and stimulate individual universities to achieve these goals without compromising the strict quality criteria.

Our proposition and recommendations to researchers, policymakers, and higher education administrations might help achieve such a goal.

In summary, this study has advanced our knowledge of how higher education may adjust to the changing needs of the contemporary world by giving priority to the development of skills related to sustainability and economic challenges. Higher education institutions may realize their role of equipping students to flourish in a dynamic and interconnected global world by embracing this necessity and cooperating towards common goals.

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