

Transformative Leadership and Sustainable Innovation in Education

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Emerald Studies in Higher Education,
Innovation and Technology

Transformative Leadership and Sustainable Innovation in Education: Interdisciplinary Perspectives

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INVESTOR IN PEOPLE

*To all the people all over the world that promote peace, friendship,
and collaboration between nations and vision a transformative
leadership to bring happiness, prosperity, and wisdom to
all the people on our planet.*

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Preface

Transformative Leadership and Sustainable Innovation in Education: Interdisciplinary Perspectives

We live in times of radical changes. In this context, higher education has to play a pivotal role in the transformation of our society, economy, and entrepreneurship with a green, sustainable footprint.

The management of the youth talent and the utilisation of the creativity and innovative spirit of young students is a critical challenge. In parallel, the arrival of new disruptive technologies such as Artificial Intelligence, Machine Learning, and Robotics, re-challenge the human part contribution in all the initiatives related to transformative leadership.

Our volume is an interesting journey. With excellent contributions from prolific researchers from all over the world, we investigate the determinants, the methodologies, and the added value of transformative leadership in universities and colleges.

In 16 chapters, we communicate an integrated agenda for transformative leadership and sustainable innovation in higher education. Items include but are not limited to:

- Leadership and Innovation in Higher Education in 2035: The Open Research Agenda.
- Driving Innovation: Interdisciplinary Perspectives and Adaptive Leadership for Cultural Change.
- Transformative Leadership in Kuwait Direct Investment Promotion Authority: Investing in Talent, Innovation and the Next Generation.
- Transforming Learning in Steam: How AI Tools and Language Models Catalyze Educational Advancement.
- Creating a Metaverse-based Innovative Digital Learning Environment.
- Nurturing Innovation: Mentoring and the Development of Exemplary Leadership Practices for Empowering Female Students in Higher Education.
- Exploring the Future of Qualitative and Mixed Methods Research Space in Nigerian Universities for Scholarship Sustainability.
- School as Sustainable Enterprise: Building Climate Resilient Communities Through Investment in the Girl Child.
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- Artificial Intelligence and Blockchain in Higher Education Institutions: A Systematic Literature Review.
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- Transformative Leadership and Sustainable Innovation in Higher Education: Setting the Context.
- Nurturing Future Leaders: Cultivating Research and Innovation Skills in Saudi Scientific Community.
- Embracing the Shift: The Innovation Journey in Saudi Arabia's Educational Landscape.

We do hope that the diverse audiences will value our efforts and the contributions of the more than 50 contributors. The outcome of our intellectual work is a bold contribution to the body of knowledge of transformative leadership and sustainable innovation in higher education.

Our times request reflective actions and proactive plans. Our key message in this edited volume is the need for a motivational shift in strategic planning of universities and colleges. Higher education institutions have to re-invent the merits and the miracles of human, individual, team, societal, and inter-cultural contributions to a new global agenda of leadership for peace, friendship, prosperity, and happiness.

All the diverse stakeholders have to re-work their agendas and need to develop action plans, and roadmaps to promote in bold ways the next-generation value strategy of their academic institutions with an outlook on people, their lives, and their prosperity in a world of global peace and understanding. Somehow, we have to re-invent our soft and creative human nature in turbulent times of wars and tensions globally. What a hard task!!!

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Chapter 1

Leadership and Innovation in Higher Education in 2035: The Open Research Agenda

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Abstract

This chapter highlights the key areas for the leadership and innovation research agenda in 2035. This agenda will direct researchers' focus to the core transversal skills that individuals must have amidst the shift toward a greener and digitalized economy. Such skills include leadership, management, creativity, communication, and adaptability. The role of macro governmental policies and micro organizational policies is of great significance to ensure the implementation (if any) of these changes and of core to the research agenda. This chapter will also guide researchers to the challenges at the higher education level that need to be addressed to ensure the balance between the skills and knowledge acquired by workers through education and the needs of businesses in order to increase productivity and innovation.

Keywords: Leadership and innovation; transversal skills; sustainability; digitalization; policy implementation; interdisciplinary approach in higher education

1. Major Innovations and Transformations in Higher Education: Examples from Worldwide Universities

Higher education is at a crossroads, having to decide between the path of knowledge commodification and focusing on efficiency and optimization with the

health of the economy as a key driver, or the path of socio-ecological transitions, necessitating new ways of research and learning as well as different capabilities and values that enhance the well-being of the planet and people (Barth et al., 2015). Furthermore, modern universal realization resulted from the function of research in Asia, not only in helping more established systems, but also in creating innovations (Coates et al., 2021). Higher education will be affected in the long run by changes made to international education, student mobility, faculty work, and research fundamentals. For example, Asian and increasingly African middle-class families will be less likely to travel to foreign schools as a result of the effectiveness of online education, which necessitates international collaboration in terms of education regulation and quality control (Coates et al., 2021). Gated campuses are already being transformed into sanctuaries, and they are giving rise to external “fab cafés” and “walk-up stores” to involve the neighborhood in knowledge-led socio-economic transformation. Governments have already heightened anticipated calls for additional proof of education’s value, social effect, and community leadership (Bice & Coates, 2016; Coates, 2017). System, institution, and resource creation are the main themes of higher education design. It expands on current design science research and practice, which go well beyond graphics, software, and objects to benefit a wide range of different businesses, stakeholders, and systems (McKinsey, 2020; Plattner et al., 2015). China, which already has the largest academic system in the world, is actively pursuing a number of programs for strengthening and diversification and is dedicated to furthering internationalization and postgraduate education. Such changes will have a significant impact on higher education around the world (Coates et al., 2021). Furthermore, opportunities for enhancing the Russian scientific and educational system have emerged with the development of the new generation of the global computer network “Neuronet,” in which conventional educational methods are replaced by cutting-edge ones based on the application of neural network technologies (Akhmetshin et al., 2020). There will be the development of new neural network-based learning techniques, as well as virtual research, modeling, computer-neural networks, hybrid networks, and labs that use socio-neuromorphic neural networks; the widespread use of neural helmets to access virtual environments, libraries, and databases for advanced training and education (Dyatlov, 2017). Thus, a unique program, termed Digital Economy, describing the main paths of digital transformation for governmental and municipal authorities, business entities, industries, and sectors of the economy, has been established by Russia and is strategically significant for the nation (Akhmetshin et al., 2020). Furthermore, new institutions have been created with more global and multidisciplinary curricula and a stronger emphasis on strong collaborations among students within a residential community as a result of larger-scale reactions to shifting global realities in recent years. One example is the Yale–NUS College in Singapore, which is a residential liberal arts college in Asia and was created by Yale University and the National University of Singapore (Penprase & Nardin, 2017). Another example is Soka University of America (n.d.) in California where a remarkable curriculum prepares students to become “global citizens” through intensive language study and classic works of Chinese, Indian, and

Greek philosophers, European social theorists, and modern interpretations of these ancient texts, all within an international setting. Finally, in order to create a framework for liberal arts in China in the 21st century, Duke University is developing a curriculum for its new Duke–Kunshan University in China with global approaches to identity and society (Godwin & Pickus, 2017).

2. The Role of Policies and Leadership for Implementation of these Educational Innovations

On one hand, universities are expected to assume organizational leadership roles and serve as a role model for the community, create and implement innovative study programs, particularly in teacher preparation, and act as professional development supporters of academics, economics, administration, and education respecting sustainability, and drive research-based development of sustainability competencies. On the other hand, UNESCO Chairs should play an international networking role in developing institutional abilities by providing collaboration and knowledge sharing among universities (Barth et al., 2015; UNESCO, 2014). For instance, during the COVID-19 pandemic, new platforms and apps have been developed by universities all over the world for the delivery of various forms of online teaching and learning. Evidence indicates that partnerships increased in 2020 as universities resorted to specialized companies to maintain effective provision of known quality (Holon, 2020). For instance, Tsinghua, China’s national public research university, enabled “clone classes” at hundreds of other Chinese institutions by utilizing internal and outside teaching resources. Such partnerships have transformative effects on higher education in the future (Wong, 2019). Governments from all around the world have proposed security issues and new legislation to manage research engagements and outputs. Higher education started looking for more structured or tiered forms of micro-lateral cross-border cooperation after a few decades of unrestrained movement. Higher education will be forever changed by the reconfiguration of international education, student mobility, faculty work, and research fundamentals (Coates et al., 2021). However, forcing the use of digital technology into a nation’s higher education system without adequate technological and methodological expertise may result in the usage of low-cost, subpar online learning models (Kochergin & Zhernov, 2019). The automation of university administrative management, the improvement of IT proficiency among teachers and students, the creation and use of internal and external online courses, the choice of research topics, and the qualification of works in accordance with the demands of the regional and national digital economies all seem to require a comprehensive, simultaneous approach to digitalization (Doroshenko et al., 2021). A number of Asian nations have already advanced robust higher education systems with reliable governance, young domestic faculty, well-defined career paths, and multi-layered international relationships. While prominent Western brands are strong, the next years may lessen their attraction as regional university brands have flourished alongside stable economies (Coates et al., 2021). In particular, industry-specific business collaboration to develop larger talent pools will be essential, as will multi-sector skilling partnerships that

make use of the same collaborative models that underpin many of the current business developments driven by technology (World Economic Forum, 2016a).

3. The Interdisciplinary Approach: A Pathway to Innovation at the Higher Education

Britain's workforce is lacking in soft skills, which are crucial transferable skills that people can utilize in a number of professional sectors as well as personal traits and attitudes that support teamwork and contribute to an organization's success. Productivity is in jeopardy, and the UK economy may suffer financially as a result (Clarke, 2016). Technology Education is a cross-disciplinary activity that can encourage active participation and involve a variety of emotive, collaborative, and practical abilities. It also calls for a strong sense of problem-solving, creativity, and critical thinking, which provide the opportunity to foster the attitudes and "soft skills" required to have productive members of society (Snape, 2017). Seen as transversal skills and contrary to hard specific technical skills, soft skills are required at the meeting point of professional and social skills (World Economic Forum, 2016a). Usually, basic skills are acquired throughout formal education and prior to starting to work; thus, there is currently an opportunity for businesses to be proactive in designing their own talent pipeline by collaborating with educators (Davies et al., 2011). Across various industries, one-third (nearly 36%) of all jobs focus on a core needed skill which is solving complex problems and this requires both creativity and adaptability. Moreover, social skills involving communication and emotional intelligence, cognitive abilities involving creativity and mathematical abilities, subject-specific skills, and critical thinking skills are all expected requirements for many industries across the job market (Gray, 2016; World Economic Forum, 2016a).

Etzkowitz and Zhou (2017) highlighted that in a knowledge-based society, universities have evolved from being secondary to primary institutions for economic progress. Higher education's "innovation engine" role stresses the long-term economic benefits of the institution's societal engagement, such as raising the caliber of local labor, transferring technology to industry, and enhancing the allure of the local environment for entrepreneurs, the standard of local labor, transferring technology to the market, and making the area more appealing to entrepreneurs (Cai & Liu, 2015). The shift in higher education toward sustainability should promote interdisciplinary and transdisciplinary perspectives (Leal Filho et al., 2018), ethical conversations and reflections (Biedenweg et al., 2013; Howlett et al., 2016), and the adoption of critical thinking (Howlett et al., 2016; Wooltorton et al., 2015).

The "T-shaped" worker of the next ten years brings a thorough understanding of at least one field but also has the ability to communicate in a wider variety of disciplinary languages. This calls for curiosity and the desire to continue learning long after formal schooling has ended. It will be crucial for workers to develop this T-shaped trait as longer lifespans encourage various professions and exposure to more industries and expertise (Davies et al., 2011). Scientists began to understand that some problems are too complex to be adequately treated by a

single field of research and that other disciplines must be involved. The effects of climate change on society, the environment, and sustainable development are all clear examples. To investigate the causes and effects and create solutions, it necessitates the skills and resources from numerous disciplines, including the natural sciences, engineering, and social sciences (Mazzocchi, 2019). Furthermore, by examining and analyzing the dynamics of multidisciplinary research, the philosophy of science can help researchers avoid mistakes and strengthen the methodological foundation of their work (Mäki, 2016). One example is that the American Medical Association has asked for telehealth to be made a core competency for medical students, recognizing that telemedicine and telehealth would play an increasingly important role in the delivery of health care. They do so aware that despite patients' interest in telehealth, research has shown that a major barrier to physicians practicing it is a lack of education (Xu et al., 2018).

Today's job markets and in-demand skills are vastly different than the ones of 10 or even five years ago, and governments, businesses, and individuals alike are increasingly concerned with identifying and forecasting skills that are relevant not just today but that will remain or become so in the future to meet business demands for talent and enable those that possess them to seize emerging opportunities. In light of technological trends such as the ones outlined in this chapter, in recent years many countries have undertaken significant efforts to increase the amount of science, technology, engineering, and mathematics (STEM) graduates produced by their national education systems (World Economic Forum, 2016a). Some potential avenues for transformation in higher education institutions include: (1) emphasizing the growth of qualities including critical thinking, insight, and analysis skills; (2) including digital literacy in educational initiatives; (3) incorporating experiential education that emphasizes soft skills extending the learning constituency to include all age groups, not only teenagers and young adults; and (4) incorporating interdisciplinary education that enables students to gain knowledge and abilities in a variety of disciplines (Davies et al., 2011). One strong example is the experiential approach used in Seow, Pan, and Koh's study using a project-based course with an interdisciplinary approach, collaboration between external entities and faculty, and engaging mentoring of students by faculty and external entities. In the end, the approach helped students build their cognitive, interpersonal, and intrapersonal competencies (Seow et al., 2019).

The growth of interdisciplinary education, research, and training has been a primary objective for many institutions' programs and overall goals in recent years (James Jacob, 2015). In addition, there is a need for top-down leadership, such as that of presidents, deans, chairpersons, community leaders, accreditation associations, to encourage interdisciplinarity by establishing objectives, standards, structures, and resources that support faculty members' work and interdisciplinary programs (McWilliam et al., as cited in Shandas & Brown, 2016). For instance, a large number of reward structures rely on budgeting models. Many public and, increasingly, private institutions are creating performance- or responsibility-based budgetary models, which severely restrict the capacity of programs to form interdisciplinary connections with one another. This development is largely a response to pressures from state or federal budget management requirements

(Shandas & Brown, 2016). Additionally, accreditation lends respectability and credibility to higher education throughout the world; for instance, Wassen et al. (2015) explain that the assessment conducted by the Coordination for the Improvement of Higher Education Personnel (CAPES) is the main reference of the quality of graduate programs in Brazil. It is also important to note the significant rise of the interdisciplinary area, created by CAPES in 1999, which presents since then an increasing number of requests for interdisciplinary research (Steil as cited in Tavares et al., 2022).

4. Moving Toward a Sustainable Future Through a Greener and Digitalized Economy: The Role of Higher Education

An essential tool for sustainable development is the green economy. However, the literature hardly ever discusses the function of higher education in a green economy, but Gao et al. (2019) helped to close this gap. They discovered that the development of a green economy is significantly influenced by higher education and that the green gross domestic product (GDP) is more responsive to changes in higher education than the traditional GDP (Gao et al., 2019). Since digitalization presents so much potential for inventions and ideas, it is expected that new entrepreneurial occupations will emerge. Hence, there will be a call for green business owners that deal with environmental issues and work to maintain a sustainable and healthy environment (Eberhard et al., 2017). Since the level of the worker's skill has a significant impact on economic growth, universities must take into account the growing trends outlined in the preceding chapters while updating their teaching methods and content in order to guarantee that the future labor force will be knowledgeable (Daggett, 2014). The development of novel delivery methods as part of an institution's offerings, the integration of cutting-edge technology and pedagogies into the curriculum, and the provision of suitable training for academic staff and students should all be outlined in institutional strategies (European Commission, 2014). Therefore, programs are developed to assist institutions and students in acquiring the skills needed by the dynamic job markets of the future (as cited in Eberhard et al., 2017). Environmental and social issues are particularly important to social entrepreneurs (Gore, 2017). Additionally, there will be a rise in the demand for occupations addressing issues like innovation to zero, green innovation, and the economy. A major goal of businesses and governments called "Innovation to Zero" is to create cities with no carbon emissions (Frost & Sullivan, 2019).

Robotics, 3D printing, artificial intelligence, nanotechnology, and biotechnology are all areas where the fourth industrial revolution (Industry 4.0) is developing. Such progress will result in a paradigm shift in defining the skill background required to solve these difficulties, drastically altering the job market globally (World Economic Forum, 2016b). Additionally, outside of the classroom, multidisciplinary learning must be made possible by providing all students with access to low-cost digital-making possibilities, which, according to research, are in extremely high demand (Quinlan, 2015). In order to adopt Industry 4.0, specific soft skills such as the ability to work in teams, networking, communicating, self-development, creativity, innovative reasoning, and leadership skills are

a must to achieve this progress (Cotet et al., 2017). Furthermore, it is a must to be trained to use these technologies efficiently, and being part of companies' projects helps build social skills and time management enabling college students to develop social, mental, and personal skills to become future market workers (Eberhard et al., 2017).

Social innovation can be fostered through varied activities executed via a transdisciplinary framework, technology-based collaborative learning, and communication transformation encouraging diffused knowledge and learning (Kumari et al., 2019). Creative businesses of tomorrow are in desperate need of a multi-disciplinary blend and proficiency of scientific and artistic skills, unlike what traditional higher educational systems are geared toward (Stevenson, 2015). In fact, Nesta (National Endowment for Science, Technology and the Arts, an independent charity that works to increase the innovation capacity of the UK), notes that creative jobs and highly creative positions have the immunity against atomization as the requirements of working in complex settings without a predicted specific outcome cannot be solved by robots (Bakhshi et al., 2015; Frey & Osborne, 2014). Beyond the actual walls of the office or factory floor, telecommuting, co-working spaces, virtual teams, freelancing, and online talent marketplaces are all on the increase. Data analysts and skilled sales representatives are two occupations that stand out. New types of human resources and organizational development specialists, engineering specialties like materials, bio-chemicals, nanotech, robotics, regulatory, government relations specialists, experts in geospatial information systems, and commercial and industrial designers are some other newly emerging specialties that are frequently mentioned (World Economic Forum, 2016a).

5. Research Agenda for 2035

There is a need for potential reskilling and upskilling talent from a variety of academic backgrounds in all industries because disruptive changes will have a significant impact on skill requirements and are creating opportunities and challenges across all industries, not just those that are specifically related to “hard knowledge,” technical skills, and technology (World Economic Forum, 2016a). One of the essential steps to achieve successful digitalization of higher education is by training teachers to perform their tasks using these technologies and enhance their qualifications and technical competencies (Akhmetshin et al., 2020). Since there is a demand for employees' new knowledge and abilities, the objective requirement is to modernize the system of additional education in the following areas: (1) development of a wider list of programs; (2) increase in training programs implemented through online platforms; (3) wide development of online educational models; and (4) implementation of active collaboration with professional communities (Ziyadin et al., 2019). Therefore, the transition to online education for higher education is an essential leading trend, but it still lacks adequate legislative oversight of online education; the use of distance learning technologies in the classroom, which is correlated with both a lack of innovative infrastructure and a shortage of teachers with the necessary skills to work in a digital setting; and

the good rate of students who are able to successfully complete their education online (Aleshko et al., 2019). Additionally, data indicate that students themselves do not view digital education as a full-fledged discipline. The development of adaptable mechanisms is necessary to rectify the situation in order to individualize educational paths and bring the educational system closer to the job market's ever-changing needs (Aleshko et al., 2019). Thus, human resource professionals should create a workforce plan for sustaining corporate goals involving working with universities to address lifelong learning and skill requirements. Governmental decision-makers will need to place education as a top priority in order to adapt to the changing environment; otherwise, people may be ill-prepared for a healthy and sustainable future (Davies et al., 2011). There is a genuine chance to increase the level of information support for the educational process given the significant acceleration of the speed of scientific and technical advancement and the use of various communication tools and technologies in the educational process (Beloglazova & Bondareva, 2015). It will undoubtedly result in the complicated challenges associated with higher education's digitalization being resolved; yet, this is still not achievable in the absence of the adoption of new teaching materials (Akhmetshin et al., 2020).

References

- Akhmetshin, E., Barmuta, K., Vasilev, V., Okagbue, H., & Ijezie, O. (2020). Principal directions of digital transformation of higher education system in sustainable education. *E3S Web of Conferences*, 208, 09042.
- Aleshko, R., Petrova, L., Ivanova, E., Plotnikova, A., Melnikov, M., & Antonov, V. (2019). Human capital in the digital economy format. *International Journal of Engineering and Advanced Technology*, 9(1), 7517–7523.
- Bakhshi, H., Frey, C. B., & Osborne, M. (2015). *Creativity vs. robots. The Creative economy and the future of employment*. Nesta.
- Barth, M., Michelsen, G., Rieckmann, M., & Thomas, I. (Eds.). (2015). *Routledge handbook of higher education for sustainable development*. Routledge.
- Beloglazova, L. B., & Bondareva, O. V. (2015). Electronic means of teaching as the basis of educational process at the modern higher school. *RUDN Journal of Informatization in Education*, (1), 35–41.
- Bice, S., & Coates, H. (2016). University sustainability reporting: Taking stock of transparency. *Tertiary Education and Management*, 22(1), 1–18.
- Biedenweg, K., Monroe, M. C., & Oxarart, A. (2013). The importance of teaching ethics of sustainability. *International Journal of Sustainability in Higher Education*, 14(1), 6–14. <https://doi.org/10.1108/14676371311288912>
- Cai, Y., & Liu, C. (2015). The roles of universities in fostering knowledge-intensive clusters in Chinese regional innovation systems. *Science and Public Policy*, 42(1), 15–29.
- Clarke, M. (2016). Addressing the soft skills crisis. *Strategic HR Review*, 15(3), 137–139.
- Coates, H. (2017). *The market for learning*. Springer.
- Coates, H., Xie, Z., & Hong, X. (2021). Engaging transformed fundamentals to design global hybrid higher education. *Studies in Higher Education*, 46(1), 166–176.
- Cotet, G. B., Balgiu, B. A., & Zaleschi, V. C. (2017). Assessment procedure for the soft skills requested by Industry 4.0. In *MATEC web of conferences* (Vol. 121, No. 07005). EDP Sciences.