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Quality Assurance and Triple Helix Partnership: Tools for Enhancing University Education for Sustainable Development

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Abstract

The Triple Helix partnership offers significant benefits for sustainable development in higher education. It encourages innovation through collaboration, provides diverse funding sources, and ensures that educational programs align with real-world demands and sustainability goals. This paper discussed the quality assurance and triple helix partnership, tools for enhancing university education for sustainable development. Sustainable development is the development that meets the demands of today and the future. The paper enumerated the challenges of quality assurance and triple helix partnership in enhancing sustainable development including potential conflicts of interest, varying priorities among partners, and difficulties in maintaining long-term cooperation. To address these challenges the paper suggested establishing clear communication channels, setting mutually agreed-upon goals, and creating adaptive frameworks that can evolve with changing circumstances. Regular assessments and feedback mechanisms are also crucial for ensuring ongoing alignment and improvement. The implication is that implementing the Triple Helix Model can lead to a more dynamic, responsive, and impactful educational system that is better equipped to address global sustainability challenges.

Keywords: Quality assurance, Triple helix partnership, University education, Sustainable development, Tools

Introduction

Quality is phenomenal in determining the worthiness of products or services but attracts different perceptions to different people. It determines the relevance and goodness of products or services concerning money and time vested in them. Interestingly, quality varies depending on individuals' perceptions and what it tends to achieve. Since quality means different things to different people it becomes difficult to have a uniform definition. Wordu (2022) states that quality seems elusive because it is expressed in relative terms and is based on noticeable features that individuals use to differentiate a product or service. Quality assurance is the process of monitoring and ensuring that the standard of products is achieved. In the

educational system, it is a process to ensure that input, process and output adhere to the stipulated standards in attaining educational goals.

It is expedient to observe that; quality assurance has been on the front burner among educationists and practitioners due to globalization and the upturn of digital technology. The world is now a global village and what affects one nation has a resultant effect on other nations. Unfortunately, it seems that higher education in Nigeria is not meeting the desired expectations. There is the paucity of funds, infrastructure deficit, non-digitalization and other sundry problems that have hindered the attainment of educational goals. Higher education whose primary function is installing capability, skills and experience on individuals to live a productive life and contribute positively to the development of society. Is reneging on the core function of refining and rigging individuals for a world of work. The graduates of tertiary education are roaming the street in search of white-collar jobs and the entrepreneurs are agitated that many are unemployable, academia complaining and the government is testy that the investment in education is not yielding the desired result.

The triple helix partners are agitated that there is a need to overhaul the educational system, especially higher education whose mandate is to build the manpower needs of society. The triple helix partnership consists of the government, industry and university. Ranga and Etzkowitz (2013), opined, that in a knowledge society, there is a need for synergy between the university, industry and government to create new institutions and social structures for producing, sharing, and applying knowledge. University as the hub of research needs to collaborate with the industry through community engagement, advocacy, outreach and leadership in instilling the basic capability that will help graduates in the trajectory of life and the world of work. The government is saddled with the responsibility of providing an enabling environment for academics and industry to subsist. Unfortunately, this collaboration where it existed has not yielded the desired result. There is a high rate of poverty, unemployment, gender disparity, infrastructure decay, poverty and hunger. The excruciating problems are caused by poor leadership and corruption that have ravaged every facet of Nigeria's economy making life unbearable to the citizens. This unwholesome act, in no small measure, has hindered growth and sustainable development.

This has prompted various questions that are begging for answers. Despite the proliferation of higher education why are there increases in unemployment, poverty and hunger? Is there any gap between what is taught in school and industry? Is the government not living up to their

responsibility? It is in view to provide plausible solutions to these questions that the study discusses quality assurance and the triple helix partnership, tools for enhancing higher education for sustainable development. To achieve this the paper is structured after the introduction, concepts clarification related to the topic, enhancing university education through quality assurance and triple helix partnership, the mix, sustainable development and triple helix partners, challenges of quality assurance and triple helix partners in the attainment of sustainable development, conclusion and suggestions.

Concept of Quality Assurance

Quality is a concept that has attracted various definitions based on individual perception and the worthiness of the product or service to the individual. It behooves the author to put in perceptive the meaning of quality as used in this work. Quality means anything that worth its value, has standards, and has zero defects. Ezugoh, Agu, and Egwu (2022) conceptualized quality as having exceptional standards, being purposeful, fulfilling its intended aims, providing value for money, and demonstrating consistency and transformative change. Quality assurance in the educational system is the process of ensuring that educational input, process and outcome are monitored to ensure that, standard is maintained and educational resources are effectively and efficiently utilized in the attainment of educational goals. So, quality assurance measures input in educational organizations to achieve the expected outcome. (Ekott and Jimmy, 2022). Quality assurance in education is interested in ensuring that the right quality of students are admitted, the necessary infrastructures are provided and the learning outcome achieved which will meet the needs of end users. Quality assurance encompasses a series of activities involving inputs, processes, and outputs. These activities are aimed at ensuring proper control, organization, and coordination to meet expected quality standards and achieve goals (Owam and Agunwa, 2019).

The history of quality assurance in education from inception was the responsibility of the minister of education saddled with the onus task to maintain standards, and quality in the country in line with the National Minimum Standard on Education and establishing Institution Act 16 of 1985 in conjunction with the 1999 constitutions of the Federal Republic of Nigeria (Anene, 2021: Opuyemi, 2022). To ensure a uniform standard the responsibility was bestowed on the Federal Inspectorate Service Department. It becomes necessary to state that decree No. 16 of 1985 was used to empower the Federal Ministry of Education through the National Universities Commission for accreditations of universities in Nigeria.

It is imperative to state that, the National Universities Commission is one of the pillars used to ensure standards are maintained in all universities in Nigeria. The commission was established in 1974 as an advisory agency in the cabinet office. It has grown in limits and bounds to become an influential office saddled with the responsibility to ensure quality in university education as well as carry out accreditations of programs in public and private universities in Nigeria (Wordu and Nwanguma, 2023). Other ways through which NUC ensure quality assurance in the universities are through institutions and programs accreditations, establishment of quality assurance units in various universities, imposition of sanction to universities that failed to maintain quality, constant review of the curriculum to meet international best practices, provision of quality assurance guideline and the training and organization of workshop and staff development among others.

It is enlightening to state that, there are other internal mechanisms through which quality is maintained in universities. Internal Quality Assurance Unit IQA, is a critical unit of the university's commitment to excellence and continuous improvement to ensure that, the highest standards are maintained. It involves all processes and procedures through which the university ensures that quality is maintained in the university by the university authority. In compliance with the NUC, Rivers State University established a quality assurance directorate in September 2018. It is saddled with the responsibility among others, developing a university quality assurance policy assessment framework, coordinating students' evaluation of staff teaching effectiveness and programmes, encouraging self-assessment of teaching staff, ensuring the adequacy, maintenance and proper allocation of support structure and service coordinating internal assessment of programmes and program delivery.

It is instructive to note that, the essence of quality assurance in universities is to ensure that, institutions of higher learning meet certain standards of excellence in their academic programs, research, and operations. Through prioritizing quality assurance, university graduates can be adequately prepared, not only for the demands of life but also for engaging in research and innovation that greatly contribute to societal development.

Triple Helix Partnership (3HP)

The Triple Helix Model of innovation refers to the collaboration among the academia, industry and government. Its primary purpose is for robust interaction among the trio to foster economic and social development in a knowledge economy and society (Leydesdorff, 2012). The theory was originally proposed by Etzkowitz and Leydesdorff in 1998. The model describes the

interactions and relationship between academia, industry and government in fostering innovation within a knowledge-based economy (Etzkowitz and Leydesdorff 2000). In the same vein, the Triple Helix Partnership is a collaboration among the university, industry and government for sustainable development. In a knowledge-based society, it becomes imperative that academia, industry and government synergize to ensure that graduates are instilled with the skills and knowledge that enhance them in the world of work and personal development.

In the past, universities, industry and government were traditionally segmented and each operated independently. Universities were primarily focused on knowledge generation and research while industries concentrated on applied research and commercialization of research products. The government provided an enabling environment for businesses to thrive through policy formulation and implementation. With the emergence of a knowledge-driven society, there is a need for interconnectivity among the Triple Helix Partners in knowledge production, technology progress, and economic development as essential for economic relevance and global competitiveness. The Triple Helix Model emphasizes integrated and dynamic interaction among the three sectors. According to Cai and Etzkowitz (2020), the Triple Helix Model emerged in the early 1980s due to the entrepreneurial university paradigm, where academic institutions actively promote regional development through knowledge-based activities. Universities have experienced a substantial transformation, fundamentally reshaping the core functions of education and research. The contemporary imperative has driven this paradigm shift for universities to reposition themselves as entrepreneurial universities (Fernandez, Fernandez, Ray and Bobillo 2019). This new order in universities, including the transfer of knowledge, has gained great relevance in recent years because it is considered a key element that impacts economic development (Martinez-Ardila, Castro-Rodriguez, and Camacho-Pico 2023). These authors believed that entrepreneurial spin-offs represent a primary force in directly commercializing university intellectual property. These also serve as catalysts for local and national economic expansion and potentially yield significantly greater financial returns for universities when compared to patent licensing.

This marked the beginning of a paradigm shift where universities transitioned from being entities focused on knowledge generation to becoming entrepreneurial institutions actively engaged in economic development. This underscores the importance of triple helix partners, and collaborations of universities, industry and government. Universities started participating in technology transfer, patenting, and the establishment of spin-off companies, aligning more

closely with industry requirements and market needs. Industries progressed from being passive recipients of academic knowledge to active contributors in the innovation sphere. Companies increasingly sought partnerships with universities to gain access to cutting-edge research and a pool of skilled graduates. These collaborations enabled companies to jointly develop technologies and innovative solutions, enhancing their competitiveness in global markets. The government played a pivotal role in promoting this partnership by formulating policies and frameworks that encouraged cooperation. Initiatives like funding schemes, tax benefits, and the creation of innovation hubs and research groups facilitated closer connections between academia and industry. These policies aimed to establish an environment conducive to innovation and the swift commercialization of research outcomes.

It is pertinent to note with the upturn of digital technology and globalization of knowledge, there is a need to rethink the existing relationships in the traditional triad which led to the Quintuple Helix Model QHIM. The new social and economic concerns have led to the expansion of the nonlinear model of innovation to QHIM which includes society and the environment. The Quintuple Helix Model was proposed by Elis G. Garayannis and David J. Campbell in 2010 recognizing the importance of the fifth helix in fostering sustainable development and innovation (Mineiro et al, 2021). They highlighted the importance of universities, industry, government as well as civil society for innovation and sustainable development.

Enhancing University Education through Quality Assurance and Triple Helix Partnership

In the rapidly growing digitalization of educational institutions and globalization of the economy, the collaborations of the university, industry and government are seen as critical players in fostering innovation, economic development and social well-being. Quality assurance mechanisms ensure that the educational standards meet the evolving needs of society and industry. By integrating quality assurance processes with triple helix partners, universities can design and implement curricula aligned with sustainable development goals, thus preparing graduates to address global challenges. It becomes instructive to state some of the various ways of enhancing university education through quality assurance and triple helix partners such as:

1. Curriculum Design and Sustainable Development.

Curriculum design is crucial for integrating sustainable development into higher education. Universities should adopt interdisciplinary approaches that emphasize the interconnectedness

of social, economic, and environmental issues. Sustainable curriculum design integrates sustainability principles into courses, fostering critical thinking and prompting real-world problem-solving. Maraques, Farronan, Espinoza, Farronan, Anajera and Armenteros (2024) opined that integrating sustainable development goals (SDGs) into education can improve students' understanding of sustainability and equip them with the skills to address global challenges. This makes education more relevant and prepares students to become agents of change in their communities. According to Tommasclla, Akor, Lawson, Howarth and Bedford (2024), integrating SDGs into education fosters collaboration with business communities and promotes the real-world application of sustainable practices. The importance of integrating curriculum design and sustainable development cannot be overstated. From a societal perspective, the integration can result in a more knowledgeable workforce that prioritizes sustainable development in their professional practices, ultimately contributing to significant societal goals such as poverty reduction and environmental protection (Kharo and Steward, 2024).

It is imperative to note that the quality assurance framework ensures that sustainability is consistently integrated across disciplines, fostering an institutional culture that prioritizes sustainability. The integration of sustainability principles into the educational system, this alignment can lead to improved operational efficiency and stakeholders' satisfaction (Khaireddine, Lacombo and Jar-Boui 2023). In the same context, it is argued that integration of sustainable practice and quality assurance not only enhances the quality product, fostering a sustainable orientation but also contributes to long-term development goals that benefit all stakeholders (Yasir and Mamdouh 2023: De-Menezes, Escri-Tena and Bou-Liusar 2022),

The implementation of a robust quality assurance framework ensures the consistent integration of sustainability across various disciplines, thus fostering an institutional culture that places a high priority on sustainability. Furthermore, it promotes the ongoing review and adaptation of the curriculum in response to emerging global trends and challenges.

2. Teaching and Learning Methods for Sustainable Development

Effective teaching and learning methods are essential for imparting knowledge and skills related to sustainable development. Universities should adopt innovative pedagogical approaches, including project-based learning, experiential learning, and digital tools, to engage students in active learning. These methods enable students to apply theoretical knowledge to

practical situations, thereby deepening their understanding of sustainability issues. Song and Koeun (2024) assert that integrating sustainability concepts into educational curricula enhances students' comprehension and dedication towards environmental issues. The authors further advocated for the adoption of teaching methodologies that encompass meaningful interactions, utilization of eco-friendly materials, and engaging activities, alongside the involvement of families and communities, as a means to foster sustainable development within environmental education.

Scholars posit that integrating digital technologies alongside effective teaching strategies bolsters educator efficacy, elevates teaching quality, infuses curricula with Sustainable Development Goals (SDGs), and promotes innovative pedagogical approaches, ultimately equipping educators to contribute to sustainable development. (Maja, Krabonja, Kustec, Skrbinjek, Abersek, and Andrej 2024: Zuliyati, et al, 2024). The integration of digital tools in education provides increased flexibility and accessibility, enabling a larger number of students to participate in sustainability-focused programs. Some of the most effective pedagogical strategies for promoting sustainable development among students include experiential, inquiry-based, problem-oriented, and project-centred learning methodologies. According to Singha and Singha (2024), these approaches foster the practical application of knowledge, encourage the exploration of concepts, engage students with real-world challenges, and promote leadership roles. In doing so, they empower students to advocate for sustainability and drive positive change.

3. **Assessment and Evaluation in Sustainable Development**

Evaluation tools need to be designed to assess how well sustainability is integrated throughout the curriculum. The adoption of assessment and evaluation strategies can maximize effectiveness by analyzing goals achievement factors, adapting to changing environment and identifying areas for improvement to achieve results (Khokhuliak (2023). This involves monitoring the alignment of course outcomes with sustainability goals and ensuring that teaching methods promote critical thinking and problem-solving skills related to sustainable development Kloup and Voulvoulis, (2019).

So, the combination of quality assurance and the Triple Helix partnership provides a strong framework for improving university education. By prioritizing curriculum design, teaching and learning methods, and assessment strategies that are in line with sustainable development, universities can help create a more sustainable and fair future. Ongoing collaboration between

academia, industry, and government is crucial to ensure that higher education stays relevant and adaptable to global challenges.

The Mix, Sustainable Development and Triple Helix Partners

The concept of development is globally acknowledged as an improvement in the standard of living. It is associated with better lives in every facet of human endeavour. The concept has garnered considerable attention recently, aiming to meet current needs while safeguarding future generations' ability to fulfil their requirements (Brundtland Commission 1987). Sustainable development is a framework aimed at sustaining finite resources necessary to provide for the needs of future generations by meeting current societal needs, addressing societal problems, and learning to live sustainably. (Igbo, 2016: Amadi, Chinelo and Dike 2021). Sustainable development encompasses life coping skills like literacy, communication and life learning skills that enhance sustainable development. Thus, governments globally put resources, fiscal policies and programmes that will enhance the quality of life, governance, economic growth and social inclusion. Nwankwo and Uzoezie (2016), posit that, sustainable development encompasses inter-generational equality, gender parity, and establishment of just and peaceful societies, social inclusivity, environmental preservation and restoration, poverty alleviation, and the conservation of natural resources. Thus, the core of sustainable development lies in the integration of economic expansion, ecological preservation, and societal inclusivity.

The concept involves striving for a harmonious balance between economic pursuits, environmental preservation, and the overall well-being of the community. It emphasizes the idea that the advancement of one should never come at the expense of the others. The Sustainable Development Goals represent a blueprint for transforming our world through 17 key areas. They encompass a wide range of societal aspects, with a focus on the quality of basic education as a fundamental driver for sustainable development. Improving the quality of education is seen as a catalyst for increased productivity, higher living standards, and the overall development of a healthier nation. It becomes imperative to state that higher education institutions play a crucial role in promoting sustainable development through teaching, research, and community services. The Triple Helix model, which emphasizes collaboration among academic institutions, businesses, and governmental bodies, has emerged as a vital framework for advancing the objectives of Sustainable Development Goals (SDGs). These goals necessitate the collaborative efforts of multiple sectors, encompassing academia, industry,

and government. Each sector assumes a distinct yet interconnected role in propelling sustainable development.

The Academia

University education epitomizes the culminating stage of academic pursuit within an individual's educational trajectory. It offers the necessary infrastructure and framework to achieve educational goals. Serving as a repository of knowledge, it is responsible for nurturing, developing, and enhancing individuals for the betterment of both individuals and society as a whole. (Wordu and Wodi 2024: Emeka, 2018). The university as the research hub is not only saddled with the responsibility of conducting research and development in sustainable technology but also providing education and training on sustainable development. This is consistent with UNESCO, a prominent agency for sustainable development, which assists countries in creating and expanding educational activities that concentrate on sustainability issues such as climate change, biodiversity, disaster risk reduction, water, and sustainable lifestyles (UNESCO, 2024).

Also, it is within the purview of the university to create knowledge and disseminate for sustainable development and inculcate sustainable mindset and practices. University through research, collaborates with other research institutions to provide useful data and advice that develop frameworks and tools that harness the complexity of sustainable development agenda (Lahi, 2019). Therefore, there is no gain in saying that the university is crucial in generating knowledge and the know-how that underpins sustainable development. Through community engagement, leadership and advocacy, universities can provide knowledge clusters, and research hubs in the community that will drive innovations and sustainable practices. Additionally, academia strives to increase awareness and provide education, preparing the next generation to advocate for sustainable mindsets and practices.

Industry

Industry plays a crucial role in the advancement of sustainable development, being a significant contributor to environmental challenges while also serving as key actors in the implementation of solutions. Industries can serve as a driving force for sustainable development by integrating environmental, social, and economic considerations into their practices. According to Karimov and Dadashova (2023), this can be achieved through innovative practices potential, utilizing balanced scorecard indicators, and fostering scientific and industrial interaction to ensure sustainable enterprise practices. Interestingly, industries used to be the prime mover of

economic development when it was industrial society. However, with the advent of knowledge society, it became imperative for effective collaboration of the triple helix. It is important to note that, the triple helix model is anchored on collaboration among the three for sustainable development. It is enlightening to observe that, industries are adopting sustainable approaches, including the reduction of emissions, waste management, and efficient resource utilization. Universities generate the knowledge while the commercialization of the knowledge becomes the responsibility of industries. Consequently, industries can help in sustainable development in the following ways,

i. Collaborating with universities and the government to develop new technologies and address sustainable challenges, developing innovative solutions, and ensuring that practices align with regulatory standards and international best practices.;
ii. develop sustainable technology and adopt sustainable practices;
iii. create employment opportunities that will enhance economic growth and development;
iv. building employee capacity through training and investing in sustainable technology and practices that enhance both the environment and financial performance.
v. investment in sustainable technologies and practices through the reduction of waste and emissions to minimize environmental impacts.

Government

The government is one of the triple helixes that plays a crucial role in the development of educational institutions and industries by providing a framework and enabling environment for businesses to thrive. Government achieve this through policy-making, funding and setting standards and criteria that industries must adhere to ensure environmental protection and resource conservation. Governments can promote sustainable development by implementing appropriate laws and regulations, allocating necessary resources, developing strategies at all levels, establishing frameworks for public participation in urban planning, and initiating education and awareness campaigns (Sarabdeen, 2024). It is also within the purview of the government to provide funds for sustainable projects and research, encouraging industries to adopt green technologies and practices. Also, they engage in international cooperation to address global sustainability challenges and ensure that national policies align with global sustainability development goals.

In sum, the triple helix is a path for sustainable development and can be achieved through a collaborative journey that requires the active participation of academia, industry and government. Each of the helves plays a crucial role but must be in collaboration. The academia drives innovations and educates future leaders, industries implement sustainable practices and technology, and the government provides the framework and the funding for research, innovation and technology that encourage sustainable development. These sectors play a significant role in the attainment of sustainable development but of importance also the quintuple helix partners which consist of academia, industry, government, civil society and the environment. This underscores the importance of collaboration and synergy among the halves. The civic societies through advocacy will address the complex challenges, promote innovations and achieve sustainable development. In all, these halves will recognize the sustainability of and the need to consider ecological impacts in innovation and development.

Challenges of Quality Assurance and Triple Helix Partners in the Attainment of Sustainable Development.

The Triple Helix Partners has widely gained traction as a framework for fostering innovation and sustainable development. Despite the potential for development in Nigeria, there have been numerous challenges that hinder effective collaboration and contribution to sustainable development. One of the fundamental challenges of the triple helix partnership is differing priorities among the partners. Academia is primarily concerned with knowledge creation, dissemination, and academic pursuit. The industry is driven by profit maximization and seeks innovations for commercial purposes. The government is concerned with policy formulation, and implementation to foster economic growth and the welfare of the people. The industries in these countries are too weak, and the governments are too bureaucratic to play the roles envisaged by the triple helix partners. (Dzisah and Ekzkowitz, 2008). These divergent priorities often lead to conflicts and difficulties in achieving a common goal of sustainable development.

It is enlightening to observe that higher educational institutions' core functions are teaching, learning and research. In the process, technology and innovations are established. Lecturers are interested in protecting their academic property and this may vary with the industrial sectors whose driving force is to make profits. The apprehension regarding the potential loss of academic freedom in research, combined with the differing priorities of firms and academic institutions, may hinder the exchange of knowledge and present challenges to collaborative projects. (Ranga and Etzkowitz, 2013). The absence of trust can lead to scepticism and

resistance to change, hindering the implementation of sustainable development. Also, certain behaviours and procedures may contradict certain university norms, procedures and reward systems which if not addressed will impede projects of sustainable development.

The intricacy of sustainable development necessitates a comprehensive, interdisciplinary approach as opposed to a narrow focus on single scientific disciplines in research. However, implementing such an approach in practice can be quite challenging. (Zinstag et al, 2011). The Triple Helix Partner faces challenges in aligning their activities with the principles of sustainable development. According to Wals and Corcoran (2012), the complexity, power dynamics, rhetoric, and uncertainty associated with sustainability issues contribute to the challenges in addressing unsustainability. Moreover, the partners may have varying interpretations of sustainable development, leading to confusion and inconsistency in their efforts. Another pitfall is the challenge of measuring and evaluating the impact of sustainable development. The complexity of sustainable development makes it difficult to develop effective indicators and assessment tools (Holmberg and Larsson, 2018). This will make it difficult for the partners to have a uniform perspective of what constitutes success in sustainable development, leading to difficulties in evaluating their collaborations.

Another challenge noteworthy is the lack of effective communication and trust among the Triple Helix Partners. Issues such as language barriers, cultural differences, and varying levels of expertise can create problems for effective collaboration. The absence of clear policies, regulations, and incentives can result in ambiguity and perplexity, consequently hindering the efficient execution of sustainable development (Bulkeley and Betsillok, 2003). It is important to note that, the Triple Helix Model has been widely accepted and used as a framework for driving innovation and development. However, one issue is the emergence of additional helices, such as the media and civil society, leading to the concept of the Quintuple Helix Model. This expansion aims to represent the growing knowledge economy. The Quintuple Helix Model is valuable for spreading responsible research and innovation practices (European Commission 2016).

Conclusion

Quality assurance in educational institutions is phenomenal in ascertaining the worthiness of educational outcomes to societal demands. It is a process of monitoring and evaluating the education inputs, processes and outcomes to ensure that they align, not only with industrial demands but also with international best practices. The Federal Government of Nigeria is

responsible for ensuring standards are maintained through its agency, the National Universities Commission NUC. The NUC ensures these through accreditations of universities, and monitoring and evaluation of academic programs among others. Interestingly, with the upturn of an information-knowledge-driven society, there is a need for collaboration of stakeholders to ensure sustainable development. This is the crux of this paper, ensuring that, quality assurance and triple helix partners enhance university education for sustainable development. With the rapidly growing digitalization of tertiary education and the globalization of the economy, triple helix partners recognize the importance of collaboration between academia, industry and government in discharging their respective functions. By integrating quality assurance processes with triple helix partners, universities can design and implement curricula aligned with sustainable development goals, thus preparing graduates to address global challenges. Also, by aligning educational practices with the principles of sustainability, universities can contribute to creating a more equitable, sustainable, and prosperous future. Despite the benefits of Triple Helix Partners, there are challenges which called for the expansion of the Triple Helix Partners to integrate civil society and the environment. The Quintuple Helix, the additions of civil society and environment, civil society through advocacy and social engagement ensures that all interests are protected. While in the drive for development, emphasis should be placed on how to safely guide the environment for generational usage.

Suggestions

The following suggestions are proffered to strengthen tertiary educational institutions and triple helix partners in attaining sustainable development.

1. The government should establish a framework of shared vision and goals, develop a collective understanding of sustainable development objectives and ensure that funding and resources support collaborative initiatives.

2. There should be regular stakeholder engagement, and joint strategic planning to develop common objectives and establish principles guiding collaborative work.

3. The triple helix partners should create a shared vision and understanding of sustainable development and develop a dispute resolution mechanism for resolving conflict among members.

4. The triple helix partners should encourage the training and retraining of partners on capacity-building programs on sustainable practices.

5. The triple helix partners should establish clear communication channels, set mutually agreed-upon goals, and create adaptive frameworks that can evolve with changing circumstances.

6. There should be regular assessments and feedback mechanisms which are essential components for ensuring continuous alignment and improvement within the triple helix framework.

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