

# **A Comprehensive Model for Assessing University and Campus Sustainability, Accreditation, and Global Ranking**

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## **Abstract**

This paper aims to create a comprehensive model of a sustainable university by combining the concepts of sustainable universities with various university assessment systems, including national and international university accreditation, professional accreditation, and global university ranking. The model conceptualisations of university sustainability and university assessment systems were taken from different existing models in higher education. These were summarised, conceptualised, and made into three separate models to create an integrated model of a sustainable university and its assessment criteria. Surprisingly, the goals of both systems were substantially similar. Thus, the aim of establishing sustainable universities is also in line with already existing university goals, such as achieving excellence in organisational and academic goals. An innovative model combining university sustainability and university assessment systems would be beneficial in simplifying the complex and multidimensional nature of a sustainable university and may portray a more attainable and relatable view of university sustainability overall.

**Keywords** university sustainability; higher education; university assessment systems; university accreditations; university global ranking

## **Introduction**

In recent times, attention has escalated regarding the sustainability of universities, which has become one of the prevailing issues in the wider concern on sustainability (Adams et al., 2018; Trencher et al., 2014; Lozano et al., 2013). Universities play a crucial role as catalysts for the achievement of the Sustainable Development Goals (SDGs) due to their contributions to knowledge dissemination and innovation (Chankseliani and McCowan, 2021). Therefore, they must instill the value of sustainability in their students, who will become future leaders (Sharma and Stewart, 2022; Janssens et al., 2022). However, a lack of understanding of sustainability is creating a gap in sustainability practice within the university landscape (Owusu-Agyeman, 2021). Many universities have pledged their efforts to incorporate sustainability into their curricula through sustainability courses and teaching methods (Lambrechts et al., 2013). University assessment systems, therefore, should be modified accordingly to enhance university sustainability (Fadeeva et al., 2011; Janssens et al., 2022).

By integrating the university sustainability practices with university assessment systems, more systematic progress towards university sustainability can be achieved. However, assessment systems vary greatly between universities, including different categories and priorities. Therefore, systematically reviewing prominent university assessments could prove beneficial in providing a general overview of university assessment systems. This could simplify the process of linking university sustainability with university assessment systems.

By taking into account the varieties of university assessment systems, a comprehensive sustainability framework can be viewed with greater clarity. Ultimately, by combining these assessment systems with university sustainability, universities will have access to a guideline that will direct them towards sustainability. Resolving environmental issues in the anthropogenic age requires concentrated, collaborative efforts involving all stakeholders. With

this synchronised guideline, it is hoped that university will have greater impact in sustainability efforts. Therefore, the research question for this study is: “How can a comprehensive model for universities assist in achieving the predicate of a sustainable university?”

As explained above, the motivation for this research is to create a comprehensive university sustainability model with the addition of university assessment systems. According to our knowledge, no research has yet combined university sustainability with university assessment systems. Therefore, it is hoped that this combination will not only assist universities in achieving sustainability but will also assist them in fulfilling the standardised indicators of a high-quality education that are used globally.

## **Literature review**

### ***University sustainability***

Universities are under growing pressure from the industry and increased regulations to be more transparent and accountable for their corporate and collegial business (Bice and Coates, 2016). The integration of sustainability and higher education began in 1972 at the United Nations Conference on the Human Environment (Carter and Simmons, 2010). Education is also acknowledged as a significant aspect of promoting sustainable development in the 1992 Rio Conference on Environment and Development (IBE-UNESCO, 2016). Hence, the UN has several initiatives on sustainability education. One of them is UNESCO’s education program, whose ultimate purpose is education for peace and sustainability, where Education for Sustainable Development (ESD) and Global Citizenship Education (GCED) are essential tools for achieving these objectives (UNESCO, 2013), as they combine the educational content and methods that cover various sustainability education (IBE-UNESCO, 2016). Education for Sustainable Development means integrating key sustainable development issues such as climate change, disaster risk reduction and biodiversity and teaching and learning (UNESCO, 2013). While the term Education for Sustainable Development and Education for Sustainability have been interchangeably used, Education for Sustainability, is about learning to think and act in ways that safeguard the wellbeing of people and the planet. Both ESD and GCED are included as global education initiatives for the SDGs (Chung and Park, 2016). Other initiative, Higher Education Sustainability Initiative (HESI), is a partnership that aims to provide a platform for universities to support the SDGs through facilitating the dissemination of best practices and educating future leaders on sustainability (United Nations, n.d.). The inclusion of sustainability concept in the curriculum is a step towards the objective of sustainable development (Sharma and Stewart, 2022). Thus, universities provide substantial opportunities to contribute to the SDGs by working with the stakeholders and implementing sustainability in their governance (Purcell et al., 2019).

Universities have incorporated Higher Education for Sustainable Development (HESD) in the last two decades into the systems (Lozano et al., 2013). The increasing importance of declarations, charters, and partnerships, for fostering transformation HESD is evidenced by more than 1000 university leaders who ratified their commitment to work to advance HESD and research by signing the Talloires Declaration, the Kyoto Declaration and Copernicus University charter by the end of 2003 (Lozano et al., 2013).

According to Kohl et al., (2022), the ‘Whole Institution Approach’ to sustainability has been used since the 1980s to describe a holistic way of teaching that goes further than knowledge dissemination to include practice implementation. Today, the Whole Institution Approach is understood as a way to move sustainability in a holistic way, encompassing teaching content, and methodology, influencing the learning process while embedding sustainability in all aspects of the institution including facilities, operations and creating interaction with stakeholders in the community, governance and capacity building (UNESCO, 2014).

Sterling and Thomas (2006) note that despite pressing sustainability issues, most Higher Education Institutions have yet to respond in a systematic and coherent way in terms of embedding sustainability concepts, values and skills into the student learning experience. ESD implies a major challenge for the purposes and nature of university education as a whole, it is necessary for university to implement curriculum on ESD ideally as a precursor to deeper change.

Several researchers have developed their university sustainability models that depict the implementation of sustainability in universities, namely Alshuwaikhat & Abubakar (2008), An et al. (2017), Cortese (2003), Permatasari and Tindaon (2016), and Velazquez et al. (2006). These models were conceptualised based on sustainability concepts and initiatives to integrate sustainability into universities, which will be used in this study.

### ***National accreditation***

Indonesia has a national body, namely Board of National Accreditation for Higher Education (BAN-PT), as the main organisation responsible for accrediting universities. BAN-PT requires Indonesian universities to document and submit self-evaluation reports (Board of National Accreditation for Higher Education (BAN-PT), 2019). The full structure of the self-evaluation report can be viewed in Table 1 Appendix.

### ***International accreditation***

Accreditation programs consist of all systematically implemented evaluation processes used by universities to determine degrees and programmes (Schwarz and Westerheijden, 2004; Kohl et al., 2022). Both proponents and critics of international accreditations offer insights and stress the inevitable need for international accreditation. International accreditation entail AACSB, AMBA, EQUIS, ACCA, and so on. Times Higher Education also ranks universities on the basis of meeting sustainable development goal indicators.

Obtaining international accreditation has three main benefits for universities. First, considering the increased transnational exchanges, it has become a standardised quality measurement (Schwarz and Westerheijden, 2004). Second, it can provide universities with recognition, prestige, and validation from the industry and professional bodies (Trapnell, 2007). The third benefit is related to the universities’ role in improving higher education quality in developing countries (Alani and Ilusanya, 2008).

There are also four main criticisms of the international accreditation. First, conflict of interests among educational stakeholders, namely universities, governments, external

accreditation bodies, and professional bodies (Bardo, 2009; Harvey, 2004). Second, accreditation bodies are being too focused on ‘punishment’; e.g., decisions from accreditation bodies can result in loss of funding for universities (Bardo, 2009; Harvey, 2004; Karan and Sharma, 2021). The accreditation is also becoming more constructive. For example, the NVAO (the accreditation organisation of the Netherlands and Flanders) uses a more constructive approach. This framework aims to endorse staff and student ownership of the programmes and to reduce the administrative burden of the accreditation process for programmes and institutions. At the same time, it reinforces quality of programmes and institutions and be able to enforce improvement and render the quality offered visible to students, employees and society (NVAO, 2018). Third, the external accreditation process is deemed as too bureaucratic and costly for universities (Bardo, 2009). Fourth, the standardisation of goals could hamper the innovation and creativity in educational methods (Harvey, 2004; Schwarz and Westerheijden, 2004).

To conclude, the increased extent of transnational educational exchanges calls for standardised international accreditations for universities. However, a decision needs to be made regarding the extent and scope of the top educational authority in higher education system to ensure that equal footing is maintained for all stakeholders.

### ***Global ranking***

The debate about global ranking of universities is often contentious. There are four main benefits of global ranking. First, they provide information for students to configure the most ideal educational programs for their academic careers (Baty, 2013). Second, they propel universities to be transparent regarding their programs, facilities, and teaching (Sowter, 2013). Third, the data provided by universities have helped launch an array of innovative tools (Sowter, 2013). Fourth, they enable university leaders to view their competitors objectively, thus enabling more informed decision-making (Sowter, 2013).

On the other side of the coin, there are four criticisms. First, the variables used to indicate university rankings do not always correlate to quality (Safón, 2013) and not comparable as each system uses different indicators (Rauhvargers, 2011). Second, they are often hyper-focused on specific indicators, often to the detriment of other indicators (Rauhvargers, 2011). Third, they tend to be elitist and only cover certain elite universities (Rauhvargers, 2011). Fourth, they been discouraged for use as a reliable basis for educational policies (Shehatta and Mahmood, 2016; Rauhvargers, 2011), and the strength of their legitimacy should be questioned. The other criticism is the competitive nature of university rankings, contrasting the need for more collaboration from the perspective of sustainability.

### **Methodology**

This research combines a university sustainability model with various educational standards: national accreditation, international accreditations, and global rankings. The integration of the models creates one comprehensive model, showcasing university sustainability indicators with the university performance indicators.

### ***1. Selecting university sustainability models***

We select the university sustainability model by Permatasari and Tindaon (2016) as the main model concept and further developed using a series of university sustainability models by Cortese (2003), Velazquez et al. (2006), Alshuwaikhat and Abubakar (2008), and An et al. (2017).

### ***2. Selecting national accreditation standards***

The national accreditation model was taken from the standard issued by BAN-PT. The self-evaluation criterias defined in the standard were used and summarised in one encompassing model.

### ***3. Selecting international accreditation standards***

The selection process for international accreditation standards was slightly more complex. The main issue was choosing the most prominent accreditation bodies. To meet this challenge, an analysis of academic visibility and digital visibility was conducted, and two indicators for academic visibility were established. The first indicator was the total number of citations taken from the ten most highly-cited academic publications that mentioned these accreditations. This ensures that these publications have large circulation and high academic visibility. The accreditation bodies were then ranked by the highest volume of citations. The second indicator consisted of reviews of the top five citations of each accreditation and whether these were mainly positive, mixed, or mainly negative. This was done to provide a snapshot of the academic community's view of the accreditation/ranking. While digital visibility was assessed by the generated number of Google search results for each accreditation/ranking. This was done to ensure that the selected accreditations/rankings for this study were fair and balanced.

The process for selecting higher education accreditation standards was as follows. First, various major important accreditation bodies were identified. Based on their characteristics, these were further categorised into international accreditations, regional accreditations, and accreditations from professional bodies. These were then further categorised according to academic visibility and digital visibility, which obtained 7 accreditation bodies as shown in Table 2 Appendix.

### ***4. Selecting global ranking indicators***

The global ranking indicators were also selected based on academic visibility and digital visibility. After a large number of international university rankings were identified, they were then categorised based on academic visibility and digital visibility, which obtained 11 rankings. The selected global ranking indicators is shown in Table 3 Appendix.

### ***Significance and policy relevance***

The proposed integrated model can assist universities in improving operational efficiency and

raising awareness regarding sustainability. This would enhance the university's social responsibility, fulfill the Tridharma of higher education, and achieve an internationally-ranked university assessment.

## **Results and discussion**

### ***University sustainability***

There are four main concepts of university sustainability by Permatasari and Tindaon (2016). The first concept is Leadership Commitment, consists of sustainability-related governance. As outlined by Verhulst and Lambrechts (2015), a strong university leadership within its organisational management system is one of the core components of university sustainability transformation.

The second concept, Academic Approach consists of universities' education and learning curriculum as well as teaching and research in sustainability. The integration of sustainability programs with academic aspects is crucial, and they are strongly influenced by campus sustainability networks, internal agents of change, as well as climatic zones, local income levels and poverty rates (Washington-Ottombre and Bigalke, 2018).

External Approach defines its relationship with the external community and involves public participation, community services, and social justices. The importance of cooperation initiatives between universities and their surrounding environment is currently an under-researched topic (M. Yarime and Tanaka, 2012). While informal faculty member meetings, student groups, and community activities/collaborations are pivotal to the success of university sustainability programs, these are frequently overlooked.

A university's Internal Approach consists of two main approaches: the campus itself and performance management. Sustainability in the campus sphere includes: environmental management, such as pollution prevention and recycling; green campus, which consists of green transportation and buildings; as well as university operation. Utilisation of green buildings and sustainable facilities are not only environmentally beneficial, but also a symbol of their sustainability commitment.

### ***National accreditation***

The standard issued by Board of National Accreditation for Higher Education (BAN-PT) (2019) was categorised into nine main indicators. The first indicator is Vision, Mission, Goals, and Strategies, which is based on universities' defined set of vision and mission and further conceptualised into goals and achievement strategies. Second, universities' success in Governance and Cooperation is determined by various key indicators, such as public leadership that connects with the community, good governance evaluation, and measurement systems that are focused on students and lecturers (Board of National Accreditation for Higher Education (BAN-PT), 2019).

The third aspect, Students, is determined by the universities' policies on new student admissions, talent development, and other student services. Fourth, Human Resources, is defined by the effectiveness of the university's lecturer recruitment and development system (Board of National Accreditation for Higher Education (BAN-PT), 2019).

Fifth, universities are bound to sound practice of Finance, Infrastructure, and Facilities. This includes quality assurance systems according to the Study Program Developer Unit (SPDU) corresponding to a standard, financial means, infrastructure data, identified problems, and improvement plans in a SPDU's financial management of facilities and infrastructure (Board of National Accreditation for Higher Education (BAN-PT), 2019).

The sixth aspect, Education, consists of universities' educational curriculum, which includes teaching and research activities in sustainability field. The seventh aspect is Research, an important pillar for universities, which includes strategies to achieve research standards; university partnerships; indexed journal articles per lecturer; and student productivity in research (Board of National Accreditation for Higher Education (BAN-PT), 2019).

The eighth aspect is Community Service, which covers objectives and strategies for achieving Educational, Training, and Student Creativity Programs (ETSCP); policies on ETSCPS; SPDU strategies for achieving the ETSCP standards; and quality assurance of ETSCP (Board of National Accreditation for Higher Education (BAN-PT), 2019).

The ninth aspect configures a university's Tridharma outcomes and achievements, which includes education outcomes data system such as GPA, study periods, and graduate competitiveness; and quality assurance of defined Tridharma outcomes (Board of National Accreditation for Higher Education (BAN-PT), 2019).

### ***International accreditation***

There are nine indicators of international accreditation standards. The first indicator is Vision, Mission, and Constitution. An institution is expected to have a strong identification of its vision and mission statements. And at the heart of its purpose as a research organisation, it should also clearly identify what is considered as impact and what is considered as innovation. Their main productivity, in the form of intellectual contributions, should also be precisely aligned with its defined missions. And finally, these identified purposes should be transformed into attainable policies (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018).

The second indicator, Resource Allocation, refers to the universities' resources management. As a part of public accountability, universities should ensure their financial transparency and develop sufficient financial strategies to support their programs (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018).

The third indicator refers to universities' Organisation and Governance. Organisations should adopt sound legal basis and obtain formal recognition from an external body. Relevant regulations should be established to ensure a sense of propriety with related legal authorities (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018).

The fourth indicator is Transparency, Accountability, and Quality Assurance, an important aspect of any organisation and enables a sense of trust from the community. Universities should create internal quality management systems and assessment procedures to be adopted in the execution of their programs (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018).

The fifth indicator is Networking and Collaboration. To enhance its quality, universities should network with other relevant educational bodies, both regionally and internationally (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018).

The sixth indicator is Research, Teaching, and Education Programs, which refers to universities main purpose as quality higher education providers. To achieve this, a comprehensive management of curriculum should be designed (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018).

The seventh indicator refers to Faculty Capability, which should be correctly organised, and its staff should be trained regularly to maintain their quality (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018). The eighth indicator, Students, refers to standards established to ensure quality of educational attainment. Students need a sound student admission system and career development management systems (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018).

The ninth indicator refers to Information Dissemination to the Public, which is another public accountability procedure. Universities should collect and publish all relevant data to the public, and all information regarding educational programs should be made available to students and prospective students (International Network for Quality Assurance Agencies in Higher Education (INQAAHE), 2018).

### ***Global ranking indicators***

There are ten main categories identified from many global rankings. The first indicator refers to Research, which includes the number and quality of journal publications, the research quality of faculties, alumni research publications, research collaborations with other educational/industrial entities, and providing open-access educational output. Research output also indicates the vision of the global scholarly community (Baty, 2013).

The second indicator is Teaching, which refers to teaching quality, along with the overall reputation of a faculty, the financial and organisational support of the faculty, as well as internships/external projects available for students. Marope and Wells (2013) stated that the disproportionate amount of focus given to research publications has led to the teaching aspects being overlooked. Therefore, the inclusion of teaching indicators in this paper was considered crucially important.

Third indicator covers Knowledge Transfer/Industry Engagement, which indicates universities' capability to transform educational programs into real-world practices and transfer knowledge to related industries. Industrial partnerships are important because industries need to know which institutions are worthy of their investment in research and innovation (Baty, 2013).

The fourth indicator demonstrates universities' Infrastructure, such as their financial resources, equipment supports for students, the quality of their libraries and research labs, as well as sports facilities. Many rankings include infrastructure as one of the performance indicators (Baty, 2013; van Vught and Ziegele, 2011).

The fifth indicator pertains to Career/Graduate Opportunities, which includes student graduation rate, student standardised test results, relevant contacts with the work environment, as well as support for practical experiences. As the main consumers, prospective students are inexplicably conscious of universities' ability to provide employment opportunities (Hazelkorn, 2013).

The sixth indicator pinpoints universities' Reputation, which includes the universities' employer reputation, expert opinion on the quality of programs offered, and the charitability of the alumni. Rankings provide a strong toolkit to enhance universities' reputation in attracting talents, or as performance indicators for national governments (Liu, 2013).

The seventh indicator refers to International Outlook, an increasingly important aspect in terms of globalisation and the ratio of universities' international faculty, international students, and international education collaboration, existence of study abroad programs, and joint-degree universities. Internationalisation is beneficial for a university's reputation, creates greater diversity in its student learning outcomes, and creates important international networks (Hudzik and Stohl, 2009).

The eighth indicator reveals universities' astute awareness and support for students' Social and Economic Mobility, such as the attendance and graduation rates of students from lower income brackets. Students from lower socioeconomic brackets often have fewer chances of graduating (US News, n.d.). When a university enables its students to climb the socioeconomic ladder, it shows commitment to the future prospects of its students and should be considered a positive quality.

The ninth indicator refers to the quality of Student Life and the supportiveness of universities' environment for student wellbeing. This includes student support and counselling services, the overall demography of students and the residential town, as well as support systems for student accommodations. As outlined by van Vught et al. (2012), rankings point prospective students toward the best university where they can study, whether their investment, in terms of finances, time, and commitment, will be rewarded.

The tenth indicator reveals a university's Digital Presence, which depicts its priority in providing an education profile in the digital world. This includes the extent of public knowledge shared on websites, the number of inbound links to webpages, important altmetrics, and the size of its website. A university's commitment towards enhancing its web presence inherently symbolises its commitment to the 'transfer of scientific and cultural knowledge' in society as a whole (Webometrics, n.d.).

### ***A comprehensive model for sustainable universities***

Finally, all university sustainability concepts and educational standards were compiled into one model to provide a comprehensive overview of all major university sustainability concepts with educational performances. All concepts and indicators were simplified into six broad categories. Some of these categories correspond to the dimensions of the 'Whole School' developed by Arjen Wals. Arjan Wals key dimensions are vision, ethos, leadership and coordination, institutional practices, pedagogy and learning, capacity building, community connections and curriculum design (Wals and Mathie, 2022). A Whole School approach is currently gaining attention, for instance, in the 2021 strategic document on Education for

Sustainable Development of the United Nations Economic Commission. Our comprehensive model overlaps with the Whole School Approach in the areas of vision, ethos, leadership and coordination, institutional practices, pedagogy and learning, curriculum design, capability building and community connection.

Our comprehensive model for Sustainable Universities first category, Vision, Mission, and Constitution, provides an overview of universities' philosophical foundation. It consists of developing sustainable vision and mission, creating sustainable key performance indicators and targets, as well as aligning intellectual contributions toward sustainability. Higher education's commitment in synchronising sustainability in their constitution is well-documented. An example of this is the 1990 Talloires Declaration, a signatory of sustainable higher education vision signed by more than 265 university presidents and chancellors in over 40 countries. It sets itself as a guiding document for leadership, policies, and programs in sustainability for HEI (Adlong, 2013).

The second category is defined as Organisation, Governance, and Accountability, which refers to establishing a legal basis and obtaining recognition from relevant external bodies, establishing an exhaustive organisational structure and good governance system, developing transparent and accountable internal quality assurance system, as well as organising credible satisfaction measurement system for all parties and promoting institutional diversities in all hierarchies. The importance of integrating the university organisational structure with sustainability is an indispensable part of university sustainability. Barth (2013) discusses organisational change in the sustainability context, referring it to an important 'self-reflective praxis,' surrounding management and operational transformations.

The third category relates to the Finance, Facilities, and Infrastructure aspect, which consists of two broad sub-categories: establishing a transparent and accountable financial system which entails sustainable finance and sustainable investing; and developing sustainable campus facilities. The former consists of adopting appropriate financial resources and management to ensure financial transparency, as well as facilitating measurement indicators for financial management; while the latter is divided into three aspects: environmental management, green campus, and sustainable operations. In terms of financial investment, Indonesian higher education sector takes environment, social and governance (ESG) into account when making investment decisions (Yunica and Rahim, 2023). Environmental management covers various sustainable initiatives, such as pollution prevention, energy efficiency, resource conservation, and waste management. The concept of green campus is identified by green buildings and transportation, occupational health and safety guidelines, as well as the existence of disability access.

The finance and infrastructure dimensions of HEI sustainability is also widely discussed in the literatures of HEI sustainability. The concept of Green Campus is probably one of the most notable sustainable initiatives that institutions took upon in the beginning. Initially, many universities focused on revolutionising campus planning, construction, management, and operations to be recognised as a green campus (Wang et al., 2013). This trend has also spread to economically-developing countries, such as China (Tan et al., 2014). However, one aspect that needs to be prioritised more is the financial and faculty demands that HEIs face when adopting sustainability initiatives. This calls for a more strategical planning for educational institutions (Rusinko, 2010).

The fourth category refers to the heart of higher education: Academic Research, Teaching, and Service Providers. The first sub-group is identified as teaching and learning. Under teaching and learning, transformative learning has become one of the most prominent theory in regards to ESD. Transformative learning holds enormous potential for explaining and accompanying learning processes related to processes of transformation for sustainability, especially due to its emphasis on changing meaningful perspectives in discussions with others in spaces free of coercion (Singer-Brodowski, 2023). The teaching and learning subgroup is further categorised into teaching and education in sustainability, quality of teaching, as well as teaching management and governance. Teaching and education in sustainability refers to the existence of sustainability courses and curriculums as well as conferences, seminars, and workshops. Quality of teaching refers to developing faculty sufficiency and deployment, developing faculty management and support systems, hiring well-trained staff, and establishing sufficient allocations for faculty resources. Teaching management and governance refers to the quality control of teaching processes, which ranges from establishing education policy standards to evaluation indicators for lecturer and student satisfaction. The way the students are treated and the quality of education they acquire can have a long-term effect (Al-Adeem, 2017). The second sub-group refers to academic research, which includes research productivity, research management and governance. It is also important to have research in open access. Open Access allows anyone, regardless of financial resources, to access peer reviewed research articles and other scholarly materials. This also enhances research productivity for academic staff as their research is disseminated to a more wider audience. It maybe also possible for the research to exhibit Responsible Research and Innovation (RRI) which is a term used by the European Union's Framework Programmes to describe scientific research and technological development process that take into account effects and potential impacts on the environment and society. The importance of responsible research is emphasised to make research beneficial to all of its stakeholders including the society linked with it. Research productivity consists of journal publications, alumni research awards, and research collaborations. Research management and governance displays a university's research objectives and strategies, as well as its research evaluation mechanisms. Various research and publication landscapes could also help broaden perspectives, thereby enriching sustainability knowledge and practice (Efendi et al., 2021). The third sub-group refers to universities' role as service providers and their engagement with the industry. This is depicted by various industrial factors, such as the extent of knowledge transfer to the industry, research partnerships, co-publications with industrial partners, patents, and innovational impact on industry.

The fifth category is Students which includes four sub-categories: career or graduate opportunities, student socioeconomic mobility, student educational support, and student environmental support systems which includes the Green Office Movement. The Green Office Movement entails students, staff and academics working to advance sustainability in and beyond higher education. The Green Office Model , a student-led and staff-supported sustainability platform, is at the core of this movement. Since 2020, the Green Office Movement is a programme of students organising for sustainability (SOS) International Green Office Movement. Hong et al. (2021) also found that to achieve the higher education value, we must think about and analyse how to engage students, learning outcomes as people progress through higher education, and career development. Career or graduate opportunities consist of

the students' contact with the work environment, which is done in cooperation with the industry and internships. Student socioeconomic mobility is comprised of the attendance and graduation rate of students in the lower income brackets. Student educational support includes: student admission, progression and career development, and an inclusive, student-participatory focus in the learning process. Finally, student environmental support embodies a set of support systems, such as counselling services, maintaining diversity in student demographics, residential city demographics, and accommodation services. Counselling services for students, especially career counselling, have positive impacts on their career development through high career competencies and increasing career maturity (Ash-Shiddiqy et al., 2019). It is also recommended that universities include ethics education in their study programs to emphasize the significance of ethics in the character formation of their graduates (Amaning et al., 2021).

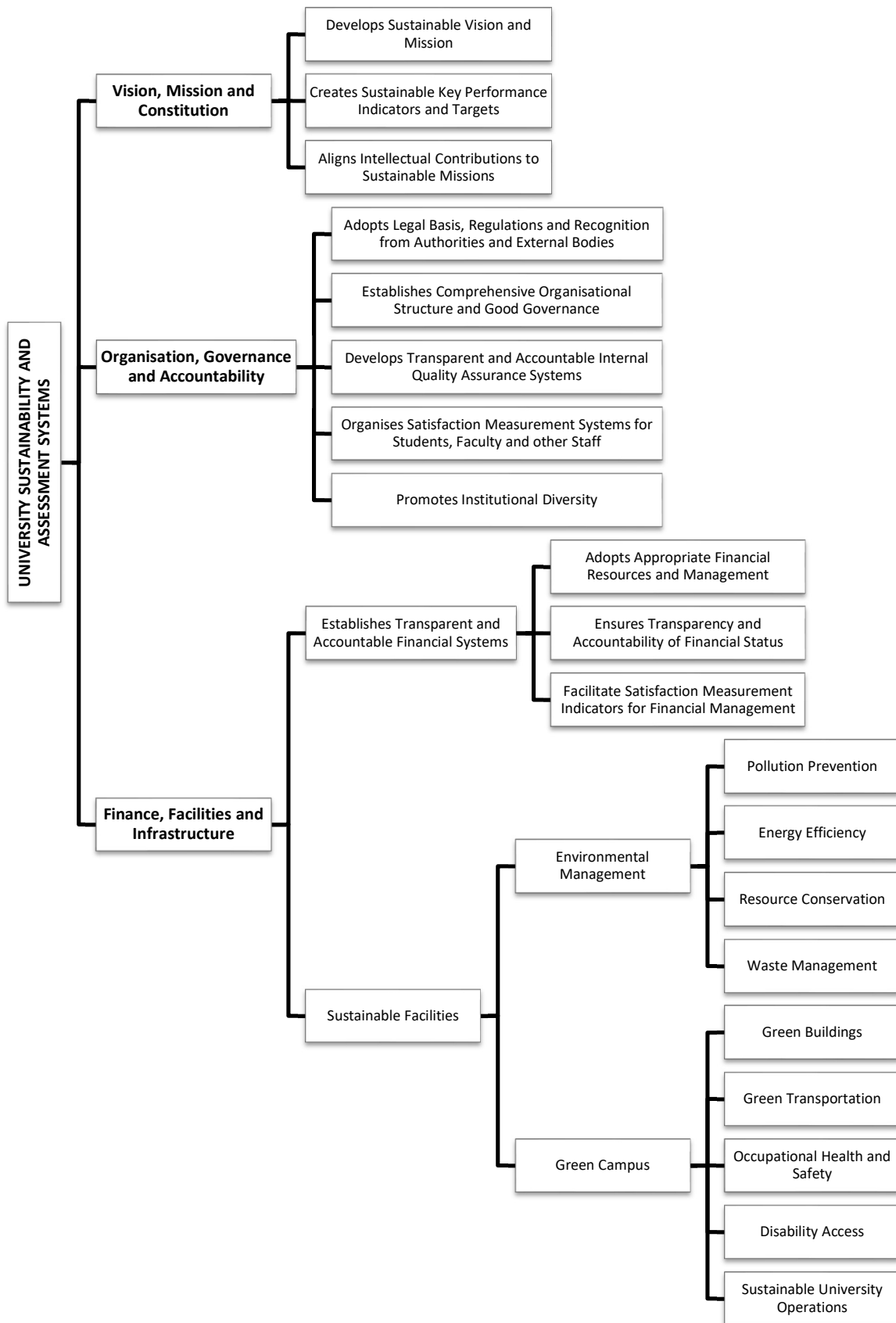
There has been an increase in the literature regarding higher education sustainability which calls for student participation in sustainability initiatives. Students, as the main consumers of higher education, should be considered as one of the main actors in bringing sustainability to light. As previously mentioned, there is an increase in adopting student-led participatory approaches in the curricula of sustainability education (Bacon et al., 2011). In addition to new sustainability courses and labs, another form of student participatory sustainability education was identified by Bacon et al. (2011), where interdisciplinary student projects in partnerships with university and communities in the Americas and Europe are being crafted.

Finally, the last category refers to the university's External relationships with other stakeholders, which covers six sub-categories. The first sub-category is networking and collaboration with equivalent educational bodies. The second sub-category is community services, which composed of public lectures, community projects and partnerships with government, private sectors, non-governmental organisations (NGOs), and media. By working with the stakeholders, universities can deliver education for sustainable development more effectively. In this way universities can be engines of social transformation (Purcell et al., 2019; Olaoye and Adeleke, 2021; Oyebanji and Roux, 2020; Sharma and Kelly, 2016). The third sub-category is identified as information dissemination to the public, which consists of collecting relevant data for public information dissemination, publishing information on educational programs, as well as publishing comprehensive information for students and prospective students. The fourth sub-category incorporates the efforts toward internationalisation and is further composed of its ratio of international faculty and students, international research collaborations, study abroad programs, joint-degree universities, and staffs with international doctorates. The fifth sub-category is classified as digital presence, which comprises of the quality of the university's website, the breadth of public knowledge shared on its website, as well as the number of inbound links to its webpages. The sixth sub-category is established as external strategy and governance, which consists of a university's external strategy design as well as its performance and user satisfaction evaluation indicators.

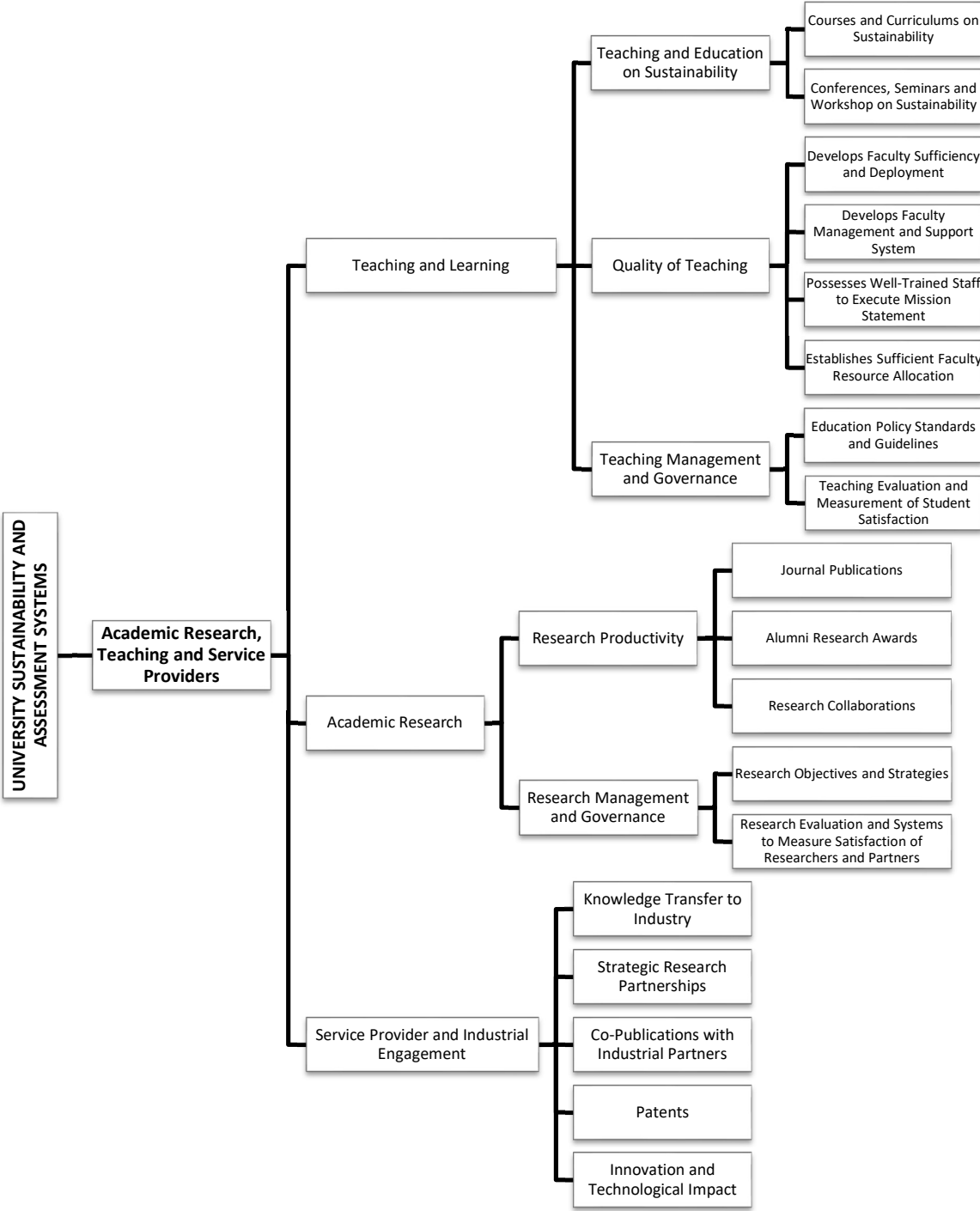
The connection of university sustainability with external stakeholders has been repeatedly echoed within academic literature. With the increase of environmental and ecological issues in the last century, the quest for sustainability requires awareness of how these issues permeate all dimensions of society. Therefore, besides integrating sustainability into higher education curricula, universities must realise real-world consequences, whether

through partnerships, local communities, or international organisations and regulatory frameworks (Tilbury, 2011). As noted by Yarime et al. (2012), proactive collaboration with diverse stakeholders or referred as transdisciplinary collaborations, should be the basis of all sustainability sciences.

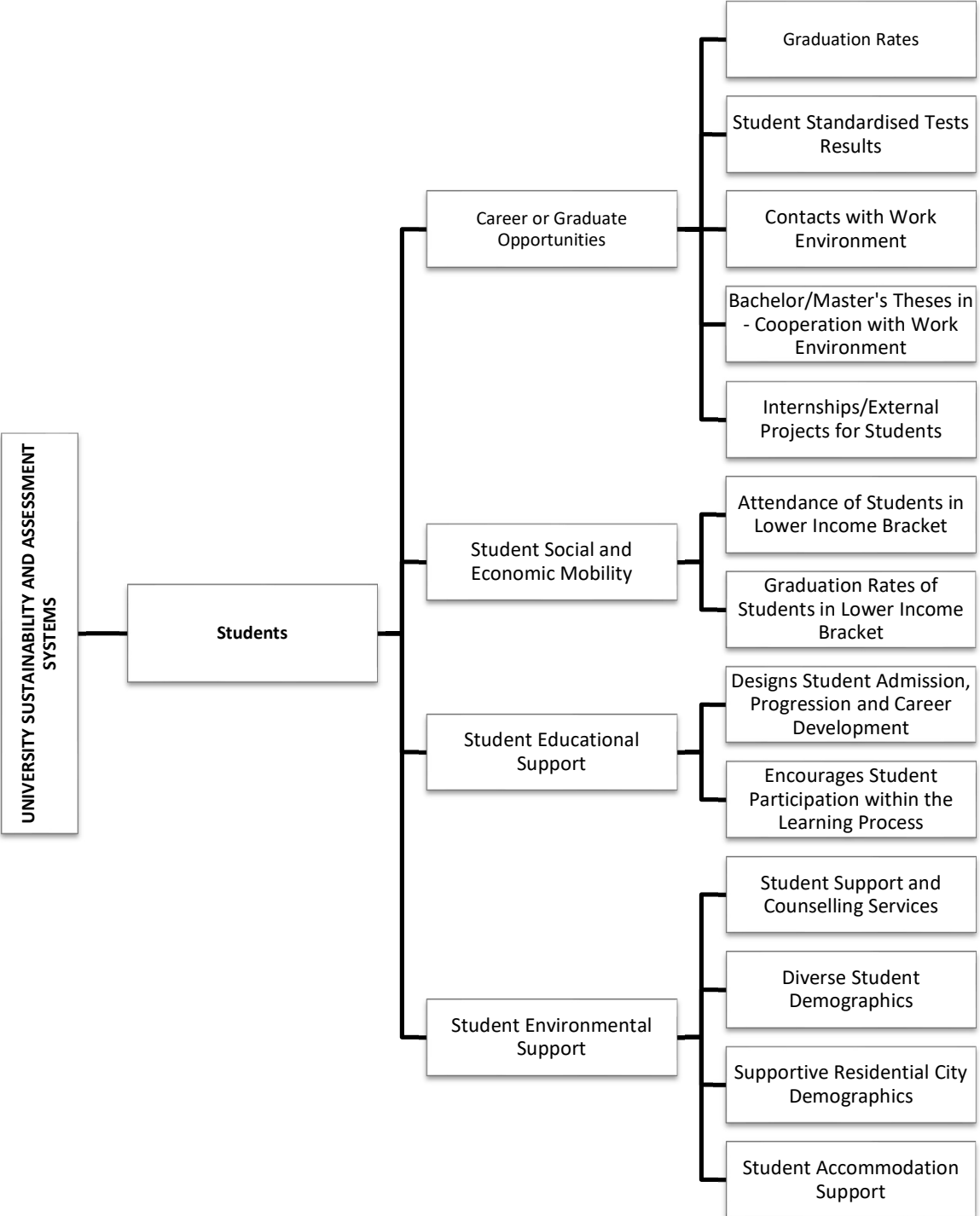
**Figure 1(a).** A Comprehensive Model of University Sustainability and Assessment Systems



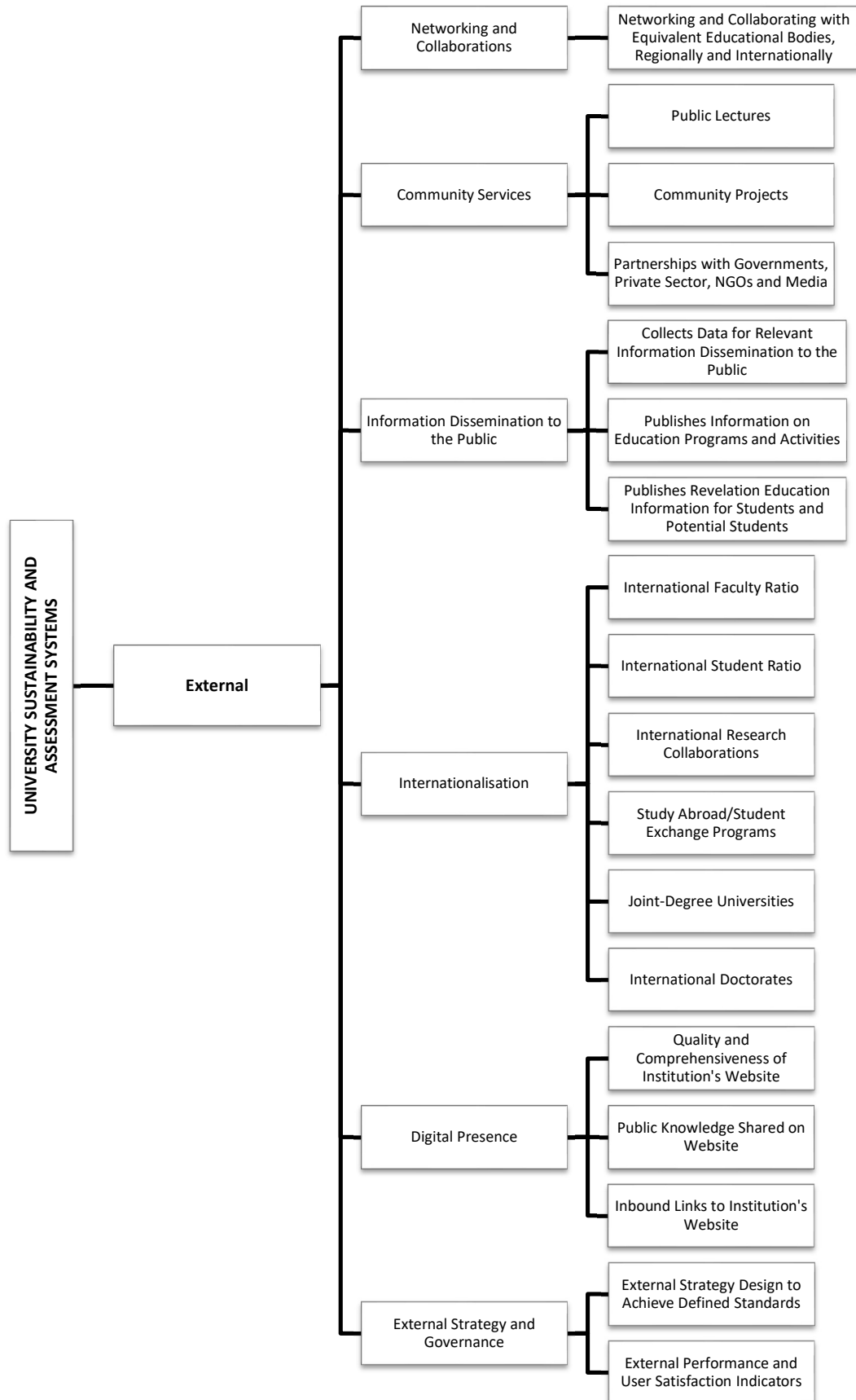
**Figure 1(b).** A Comprehensive Model of University Sustainability and Assessment Systems



**Figure 1(c).** A Comprehensive Model of University Sustainability and Assessment Systems



**Figure 1(d).** A Comprehensive Model of University Sustainability and Assessment Systems



## **Conclusion**

Universities are crucial in promoting sustainable development and achieving the SDGs (Leal Filho et al., 2021), whether through their Tridharma-based role in teaching, research, and providing services, or in connecting with various bodies in their communities (Adams et al., 2018). In terms of practicing sustainability, universities have also been creating and constructing their own respective university sustainability models.

Perhaps the link between a university's goals and university sustainability is closer than we think. Based on findings from this paper's conceptual model, substantive parallels were found between the two concepts. University organisational objectives were surprisingly similar with the objectives of university sustainability. Each concept and indicator, from university sustainability, national and international accreditation, to global ranking standards, have overlapping and repetitive themes. For example, all indicators showed a similar progression of organisational hierarchies, which ranges from conceptual vision and mission aspects, to institutional standards in organisation and governance, to the three pillars of universities, and to aspects of their stakeholder relations.

This means that the achievement of university sustainability must be implemented and approached from all levels of organisational function. It also means progressing from the conceptualisation of sustainability ideals, which will be set as the university's sustainable vision and mission, to setting sustainable organisation and governance system and implementing ecologically-friendly resource management mechanism, as well as providing teaching and research in environmental and social sustainability.

To conclude, an interlinked model of university sustainability and university assessment systems would be beneficial in simplifying the complex and multidimensional nature of university sustainability. Seeing the many challenges that modern universities already face, they may be hesitant about installing concentrated efforts toward sustainability, amidst their already limited resources. Hopefully, with the identification of the striking similarity between university goals and university sustainability, this model may be able to portray a more attainable and relatable view of achieving sustainability. Achieving university sustainability does not mean overhauling and restructuring university organisational structure, which may simply be a matter of inserting sustainability at each existing level of organisational structure. Therefore, a comprehensive framework that combines both university and sustainability goals would be most beneficial in order to achieve university sustainability.

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