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HUMAN, SOCIAL AND EDUCATIONAL  
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ÉVALUATION**

**ANALYSIS OF SOME FACTORS OF SUSTAINABLE  
UNIVERSITY GOVERNANCE AND ITS EFFECTS ON  
COMPETENCY IN EDUCATION FOR SUSTAINABLE  
DEVELOPMENT IN STATE UNIVERSITIES IN  
CAMEROON**

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**DEDICATION**

This dissertation is dedicated  
to my family



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## ABSTRACT

This study, titled "**Analysis of Some factors of sustainable university governance and its effects on competency in education for sustainable development in state universities in Cameroon,**" This study explore the relationship between sustainable university governance and the development of competencies in education for sustainable development (CESD) among students. The research begins with the observation that CESD seems to be justified by sustainable university governance and seeks to enhance the competence of future actors of sustainable development in the university. The central research question stated as: "**How does sustainable university governance enhances students' CESD at the University of Yaounde 1?**" With the aim of analyzing the effects of some factors of sustainable university governance on students' CESD. The study employs various theoretical frameworks, such as the adsorptive capacity model, paradigm of organizational learning, Niklas Luhmann system theory, stakeholder theory, the Theory of Responsible Management and Learning; using a quantitative research design, the study sampled 200 students from three faculties of the University of Yaounde 1 through simple random sampling techniques. Data collected were analyzed using SPSS version 23. The multiple linear regression analysis revealed that university sustainability knowledge, and university sustainability management strategies have a significant impact on students' CESD. However, university sustainability politics, culture, and practices showed no significant effect on students' CESD. To confirm the result, a further linear regression was performed, combining the transform data of all the sub variables under a main variable **USG**. The result gave a p-value of 0.00, which is less than the threshold value of 0.05. The findings permitted the rejection of the overall  $H_0$  and the acceptance of the overall  $H_a$ . Thus, the finding conclude that sustainable university governance significantly enhances students' CESD at the University of Yaounde 1. Therefore, the university should strengthen its use of University Sustainability Practices (**USPs**) by 73.8% to maximise this impact.

**Keywords:** Sustainable University Governance, Competency in Education for Sustainable Development, State Universities



## RESUME

Cette étude, intitulée "**L'analyse des effets de la Gouvernance universitaire pour la durabilité sur les compétences des étudiants en matière de développement durable (CDD) dans les universités publiques du Cameroun**". Cette recherche montre qu'il existe un dysfonctionnement entre la gouvernance universitaire pour la durabilité et les types de compétences dont les étudiants et ou les diplômés ont besoin dans leur vie professionnelle pour, résoudre les problèmes rencontrés dans les dimensions sociales, économiques et environnementales du développement durable. La recherche part de l'observation selon laquelle les CDD semblent être justifiées par la gouvernance de la durabilité et, par conséquent, cherchent à aider le développement des futurs acteurs du développement durable à l'université. La recherche s'appuie sur une question principale, énoncée comme suit : " Dans quelle mesure la gouvernance de la durabilité améliore-t-elle la CDD à l'Université de Yaounde I ? " Ceci dans l'optique d'examiner l'effet entre la gouvernance de la durabilité de l'université sur la CDD des étudiants. L'étude s'appuie sur des modèles et des théories, tels que la théorie du système de Niklas Luhmann, la théorie des parties prenantes, la théorie de la gestion et de l'apprentissage responsable, le modèle de la capacité d'absorption et le modèle de la triple hélice. L'étude a adopté une méthode quantitative et utilisé des techniques d'échantillonnage aléatoire simple stratifié pour échantillonner 200 étudiants dans les différentes disciplines de trois facultés de l'Université de Yaounde I. Les données collectées ont été analysées à l'aide de la version 23 du logiciel SPSS. L'analyse de régression multilinéaire a permis l'inférence. Le résultat de l'analyse a montré qu'il existe un effet significatif entre les connaissances, la stratégie de gestion de la durabilité de l'université et la compétence en matière de développement durable des étudiants, respectivement, mais aucun effet significatif entre la politique de durabilité de l'université, la culture de durabilité de l'université, la pratique de la durabilité de l'université et la compétence des étudiants en matière de développement durable. Pour confirmer ce résultat, une autre régression linéaire a été effectuée, combinant les données transformées de toutes les sous-variables sous la variable principale USG. Le résultat a donné un Sig = 0,00, ce qui est inférieur au seuil de 0,05 (Sig 0,05). Le résultat a permis de rejeter le  $H_0$  global et d'accepter le  $H_a$  global. Cela nous permet de conclure que la gouvernance de la durabilité a un effet significatif sur les compétences des étudiants en matière de développement durable, à l'Université de Yaounde I.

**Mots clés :** Gouvernance universitaire pour la durabilité, compétence pour le développement durable, universités publiques d'Etat.



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## LIST OF ABBREVIATIONS AND ACRONYMS

- CESD:** Competence in Education for Sustainable Development
- ESD:** Education for Sustainable Development
- GHRM:** Green Human Resource Management
- GHG:** Global Greenhouse Gas
- GPA:** Grade Point Average
- ICT:** Information and Communication Technology
- LMD:** Licence, Master et Doctorat
- MDGs:** Millennium Development Goals
- SCT:** Social Cognitive Theory
- SD:** Sustainable development
- SDGs:** Sustainable Development Goals
- SDT:** Social Development Theory
- SGE:** Strategy for Growth and Employability
- SLT:** Social Learning Theory
- SRE:** Sustainability, Responsibility and Ethics
- SSS:** Student Services Success Initiative
- TM:** Transformative Model
- UN:** United Nation
- UNESCO:** United Nation Educational Scientific and Cultural Organization
- UNGAR:** United Nation General Assembly Resolution
- USC:** University Sustainability Culture
- USK:** University Sustainability Knowledge
- USMS:** University Sustainability Management Strategy
- USP:** University Sustainability Politics
- USPs:** University Sustainability Practice
- WCED:** World Commission for Environment and Development
- WSSD:** World Summit on Sustainable Development



## **GENERAL INTRODUCTION**



University governance plays a critical role in ensuring the effective and efficient functioning of higher education institutions. It encompasses the structures, processes, and mechanisms through which decisions are made and policies implemented. The governance model adopted by a university can significantly impact its academic quality, financial stability, and overall reputation. The interconnection between university governance and Competency in Education for Sustainable Development (**CESD**) has gained increasing global attention. In Cameroon, universities are expected to address environmental, social, and economic challenges, given their potential to drive change. It is crucial to understand the specific framework within which they operate and explore innovative approaches to integrate sustainable development goals (**SDGs**) and principles effectively in order to promote developmental objectives. The general introduction of this study is made-up of the context of the study, statement of the problem, research questions, research objectives, significance, and delimitation of the study. It ends up with a brief conclusion, which describe and present the study.

### **0.1 Context of the study**

In every nation, university education is a crucial transformative process through which citizens are made to be responsible. In recent years, there have been an increasing recognition of the important role that universities play in promoting sustainable development since universities are key drivers of research, innovation, and social change. Around the globe, universities are adopting effective strategies to help mitigate the effects of climate change, reduce poverty and pollution while enhancing green solutions for healthier lifestyles (Health, 2025). These strategies often adopt innovative frameworks which permit the development of competences to counter sustainability challenges efficiently. According to O'conelle & al., (2014), competencies are described as appropriate for good practice in stable environments with difficult and familiar problems. Educating for sustainable development (**ESD**) enables students to understand the relationship between environment hygiene, biodiversity, health and wellbeing. However, observations suggest that students' behaviors often pose a threat to environmental sustainability, leading to pollution and loss of biodiversity. Without proper intervention from the education sector, students might continue to engage in unsustainable practices, increasing environmental degradation and public health risks. It has been shown in different studies that, students' awareness of sustainability issues within and beyond the university campus is influenced by the type of training they receive. From such, it shows that, graduates needs cross-sectoral competencies that go beyond disciplinary silos to address



sustainability challenges effectively (Deutsch, L., & al., 2025). But currently, there is a lack of innovative framework designed to foster the development of such competency. In Cameroon, traditional frameworks are common, and modern frameworks are being used unconsciously to reinforce knowledge, attitude and behaviors of internal stakeholders regarding environmental hygiene. However, unsustainable practices and consumption rates among students has been observed to be exponential, leading to an increased rate of environmental pollution, low preservation and conservation attitudes (Kumra, & al., 2025).

More so, for several years now operational mechanisms used in the universities is still to yield expected fruits since most of the universities are traditionally inclined. Again, it is time to use unique strategy; otherwise, less competent graduates will be trained, and the dependency ratio on families will increase; poverty will escalate and more youths will migrate. However, to be methodique about the concept, questioning the framework used by the universities in Cameroon is vital to find out how beneficial it is to students and the university community. The question arising through out the glope: Is how should sustainability be associated with the framework of the university for governance mechanism to foster sustain and development? How can universities legitimize sustainability principles in policies, culture, and practices to enhance students' competencies for sustainable development?.

**University governance mechanism** is a key aspect of higher education institutions, as it determines the decision-making processes and provides the overall direction of the universities. It encompasses the structures, and decision-making processes in the university, to adhere to mechanisms that direct and control, making it accountable, responsible and transparent. Similarly, adopting a sustainable university governance mechanism at the university is essential to ensure that universities operate sustainably and efficiently in alignment with their goals, objectives, missions and values,. It is a completely transformative framework that enables the university campus to respect models put in place for sustainable development. That is, through sustainable development goals, it permits the transformation of an institution's goals, starting from the evaluation of its policies, culture, practices, knowledge and management strategies to the evaluation of simple parameters such as hygiene, lightning sources, and the quality of its infrastructure, making sure they are socially and environmentally friendly. However, strong leadership for sustainability recommends that officers help in driving sustainability efforts within the university. According to Park et al. (2018), administrators who championed sustainability initiatives, provides resources and good programs for sustainability projects are more successful in promoting sustainable development



on campus. University leaders, including the rectors, vice rectors, and deans, have the power to set the strategic direction for sustainability on campus and inspire a culture of sustainability among faculty members. According to research done by Agbemabiese, Johnsrud and Rosser shows that, proactive leadership and commitment to sustainability at the top level of the university can lead to a successful implementation of sustainability initiatives through politics and policy.

According to Agbemabiese et al. (2019), universities with dedicated sustainability policies and strategies are more likely to engage in sustainable practices like reducing the rate of pollution among students while decreasing energy consumption rates, and at the same time promoting actions that encourages recycling on campus. Another aspect of university governance that has been linked to sustainable development is the role of governing bodies. In a study by Johnsrud and Rosser (2022), it was found that governing bodies with a diverse composition including representation from faculty that is internal and external stakeholders were more likely to prioritize sustainability initiatives. This shows that, governance structures such as boards of trustees and sustainability committees can provide oversight and guidance on sustainability issues within universities.

Johnsrud and Rosser, demonstrated the benefit of having a dedicated sustainability committee or task force that that is responsible for developing and implementing sustainability policies while engaging stakeholders in the university. According to the authors, by incorporating sustainability considerations into governance structures, universities can ensure that sustainability is prioritized at all levels of decision-making processes.

In addition to internal governance mechanisms, universities can also leverage their resources to collaborate with external stakeholders on sustainability initiatives. Partnerships with local communities, businesses, government agencies, and non-profit organizations can help universities address complex sustainability challenges and create a more sustainable society. Research by Shogole, M.P. (2025), has shown that universities that engage with external stakeholders and participate in sustainability networks are more likely to achieve positive sustainability outcomes. By building partnerships and fostering dialogue with diverse stakeholders, universities can leverage their expertise, research capabilities, and knowledge resources to contribute meaningfully to sustainable development at the local, and global levels.

It is often said that education plays a huge role in support of development through the supply of quality skills to meet the needs of industries. Looking at the goals and objectives of



quality education as stipulated by Roney, whether formal or informal, they aim to develop citizens that could contribute to the advancement of society positively. Walter Rodney (1985) pointed out that “development in human society at an individual level implies increasing capacity and skills, reducing inequality while increasing creativity, self-discipline, and well-being”.

Nonetheless, the education that was offered to Africans during the colonial period could not be considered as education that brings development but as education for under development (Rodney, 1985). However, little has been done concerning the integration of principles and programs that enable students to be future change agents of society, nor has any effective governing mechanism been put in place to ensure sustenance of quality programs that could make students think critically while using their sustainability and problem solving skills to resolve issues faced daily by the society.

According to Boarin & Martinez-Molina, Universities with a sustainable governance framework tend to incorporate sustainability topics into multiple disciplines and offer specific sustainability-focus or related programs. Such inclusiveness ensures that students across various disciplines have the opportunity to learn about sustainable development and its relevance to their field of study. This broad approach strengthens students’ understanding and competence in sustainability, paving the way for sustainable practices in their future careers (Boarin P., 2021).

According to Willamo, (2018), sustainable development principles are facilitated by the presence of a comprehensive sustainability policy at the university level. That is, when state universities establish clear policies and guidelines related to sustainability skills, they encourage sustainable practices such as waste reduction, and energy conservation, thereby creating an environment that fosters sustainability education.

Cottafava, & al. (2019) show that, for sustainability principles and goals to lead to effective skill development, the active participation of both managers and students in sustainability governance initiatives is an essential component for building CESD. Furthermore, universities that provide platforms for student-led sustainability focused events, and engagement opportunities demonstrate commitment to sustainable development. When both managers and students have the chance to actively engage in sustainability initiatives, they develop practical skills and knowledge that complement their learning. Moreover,



incorporating students into decision-making processes that relate to sustainability governance, empowers them to actively contribute to sustainable development.

Some schools of thought argue that, universities should focus on providing students with knowledge and technical skills that are directly applicable to their chosen professions rather than incorporating sustainability principles, goals and objectives into the university's framework. Though integrating sustainability goals into policies and culture of the university can help shape behaviors of students; it is estimated that its integration into the curriculum is better because it incorporates real-world projects that allow students to apply their knowledge and skills to address real world challenges (Javed, U., & al., 2021).

Lynn & al., (2021) showed from analysis that, current traditional lecture-based approaches are not a sufficient strategy to provide students with active learning, critical thinking, and problem-solving skills which are essential to develop competency in education for sustainable development. The authors argued that, without a good program, students will receive fragmented and incomplete education, which might limit their ability to understand and address complex challenges of development

## **0.2 Statement of the problem**

Bajamin & al. (2020) showed in the European context that there is a growing need to use a sustainable university governance framework to provide a curriculum that can enhance the competence of students for sustain development. Thus, using a governance mechanism and approach that not only enhance students' problem-solving skills but also prepares them for real-world challenges in their future careers . According to the authors, in most European contexts sustainable university governance mechanism emphasis the use of programs which makes use of case studies to help students develop a deeper understanding of their subject by applying theoretical concepts to practical situations. Using such frameworks will enable engagement and collaboration among managers, which might help to foster a dynamic environment that nurtures critical thinking abilities. In the context of Cameroon, it is observe that, the lack of sustainability skills is leading to a high rate of littering. From observation, it is shown that, citizens most especially students purchase products or goodies using plastic bags and containers. After consuming these products, they dump the plastic bags just anywhere along the road, gutters, streams and lakes. These non-biodegradable thermoplastic products made from substances such as nylon, polythene and polyvinylchloride tend to block the city channels, redirecting water into the city, causing flooding. This, in turn, makes circulation



within the city difficult. It is further observed that, the attitude and behavior of dumping and littering seem to be like a norm among the literate rather than the illiterates. Moreover, such unethical and non-sustainable practices are common among students, with over 90% being university students. Only a few, about two out of ten, use their knowledge and skills as professionals to create awareness to promote environmental hygiene and societal health. Such attitudes question the professionalism and integrity of students' knowledge and the programs that are being use for skill building.

From Cohen's theory of absorptive capacity, the university is considered to be an organization that can search, assimilate and transmit external knowledge to students. Thus integrating SDGs goals as an external source of knowledge in the university's curriculum for learning can greatly reduce the gap or tension created by the lack of knowledge of citizenship or sustainability education for science, art and education students. Making use of such goals for learning could greatly affect changes in students' attitude and behavior concerning 'environmental hygiene'. That is, students will be able to participate in the global fight, which aims at reducing global temperatures to one point five degree Celsius by decreasing the rate of littering and pollution. They will also be encouraged to purchase green products, which serve as a way to create awareness about the type of products students should encourage in their future organizations or industries. Deducing from Bandura's social learning theory, it is shown that, students are keen observers of the lifestyles and practices of managers. If their knowledge, culture, practices and strategies stimulate attitudes and behaviors that reduce poverty, increase peace, human rights, and social cohesion, there is a likelihood for the students to imitate such behavior.

### **0.3 Research Questions**

To best approach this concept, the researcher began questioning the ideas behind competency in education for sustainable development to find out how beneficial it is to the students, university community, society, as well as to the nation. The researcher questions why sustainability should be associated with the framework of the University for Governance to foster the concept of sustainable development? Why is the concept not being legitimized in state universities as well as in policy, university culture, and practice to enhance competences of students in sustainable development?

These questions aroused our interest to find out why state universities are not adopting concepts that promote critical thinking, and problem-solving skills to resolve the problems of



economic and social instability, environmental hygiene in addition to societal health. That is, adopting principles which encourages ethics, morality and social responsibility. Moreover, one could say social cohesion or living together can only be possible when such concepts is adopted.

In addition, around the globe there is an increased rate to mitigate climatic crisis, reduce poverty and provide green solution to improved healthy life-styles and wellbeing of citizens. Seeking to provide answers to these questions prompted the researcher to suggest and test certain parameters of sustainable university governance framework to suggest certain factors of sustainability which are apparently are considered as not being important but are very vital which could be use as specific factors in the context of Cameroon to enhance students' competency in education for sustainable development. To do so the researcher made use of two research questions namely general and specific research questions.

### **3.1 General research question**

How does sustainable university governance enhance students' competency in education for sustainable development in the University of Yaounde 1?

### **3.2 Specific research questions**

- i. How does university sustainability policies enhance students' competency in education for sustainable development?
- ii. How does university sustainability culture enhance students' competency in education for sustainable development?
- iii. How does university sustainability practice enhance students' competency in education for sustainable development?
- iv. How does university sustainability knowledge enhance students' competency in education for sustainable development?
- v. How does university sustainability management strategy enhance students' competency in education for sustainable development?

### **0.4 Objective of the study**

The purpose of this research is to provide a suitable framework to enhance students' competency by making use of certain factors that are used in the university unconsciously. These factors are often considered to be too weak to improve the framework and the over-all



governance of the university. However, the effects of these factors have been proven to be positive in other universities.

#### **0.4.1 General Objective**

To analyse the effect of sustainable university governance on students' competency in education for sustainable development in the university of Yaounde 1.

#### **0.4.2 Specific Objectives**

- (i) To analyse the effect of university sustainability politics on students' competency in education for sustainable development.
- (ii) To analyse the effect of university sustainability culture on students' competency in education for sustainability development.
- (iii) To analyse the effect of university sustainability practice on students' competency in education for sustainable development.
- (iv) To analyse the effect of university sustainability knowledge on students' competency in education for sustainable development.
- (v) To analyse the effect of university sustainability management strategy on students' competency in education for sustainable development.

#### **0.5 Interest of the study**

The lack of competency programs is increasingly rendering graduates unready for the job market in Cameroon. For several years today, operational mechanisms used in the universities have not yielded expected fruits. However, it is time to use unique strategies, Otherwise, less competent graduates will be trained, and the depended ratio on families will increase; poverty will escalate in addition; misery will set in; more youths will migrate; high crime waves will increase. This study aims to propose strategies that can militate between management and training of human capital.

Emergence requires certain abilities, which are folded or rapped-up in concepts such as sustainable development. This concept in one of its dimensions address the challenges of environmental sustainability, arising from a sub-dimension that is climate change. Analyzing the response of state universities to the complex challenges posed by climate variation turns out to be a very interesting avenue for assessing university agenda toward sustainable development goals.



Since Cameroon independence in 1960, the country has faced numerous challenges ranging from political instability to economic unrest with no traces of wellbeing, stability and sustainability. Recent efforts made by the government to address these issues through competency in its educational system have been challenging leading to greater concern about environmental stewardship of future graduates from state universities in Cameroon.

However, frameworks and programs meant to sustain development have been designed by the UN and many other institutions like the world bank for this purpose but have been considered in Cameroon for so long as being too weak to promote development. Sustainable development programs are becoming the most used programs to provide quality education and adequate competency needed by every nation which desire environmental, social and economic stability, more so good health and well-being of its citizens.

In addition, sustainability governance framework which is thought to be an ideal framework to inculcate skills and / or competencies, is not being used as an approach to reinforce the knowledge, attitude, and behavior to sustain development. But unsustainable practices and consumption rate among graduates have been observed to be exponential leading to an increase rate of environmental pollution and low conservation attitudes. It is evident that to meet up with the 2035 emergence vision of the state of Cameroon, there is a need to develop interest in the area of competence that can foster and sustain development.

However, only a few state universities are aware of programs use for skills development in the area of sustainability in the university. More so, the increasing depreciation of graduates' value obtained from training in Cameroon state universities is said to be very alarming and drawing attention of many stakeholders such as parents of the students who are unable to raise much from the economic to finance education of their children.

These many concerns have pricked the researcher who decided to examine the actual situation to support the state in its efforts toward quality education and development.

### **0.5.1 Practical interest within education**

The managers of education will understand the different aspects of sustainability governance mechanisms, which are used to reduce unsustainable practices in both the university institution and in industries. They will understand different competences and sustainable university governance mechanisms to adopt for to enhance sustainability competence in state



universities. Furthermore, they will work toward making state university courses more professional.

### **0.5.2 Theoretical interest**

Through this study the researcher strives to contribute to the existing body of literature in the field of management of education, to help create awareness on suitable competency for students to support development. We believe that via quality education, skill could be developed in students to care for the wellbeing of the economy, society and environment. That is, appropriate theories on sustainability governance and sustainable development principles could help provide quality understanding of both students, teachers and administrators. From absorptive capacity model proposed by Zahra and George in 2002. It has been widely used in the field of strategic management to examine the ability of firms to acquire, assimilate, and exploit knowledge from external sources.

### **0.5.3 Significance of the study**

The findings of this study are important to both the university managers, Cameroon government, and students. This will enable them integrate sustainable development principles in their framework to develop the type of skills needed to support development in Cameroon.

#### ***To the university managers***

This study will help university managers to identify and implement the principles and procedures that every institution needs to ensure quality in education. In this study, the researcher portrays some specific elements that can be used to enhance competence to care for green economy, society and the environment from the perspective of sustainability governance, which is a global concern today within university institutions.

This model is one of the most significant scientific contributions that can be used to solve the problem of choice of sustainability competency needed by students and / or graduates of public universities. The findings of this research work will raise awareness on sustainability governance model, used for training skill and/or competence for sustainable development in the university thus enhancing the strategy that should be used to train competence in Cameroon.

### **0.6.0 Delimitation of the study.**

The scope of this study involves the research boundaries according to time spread, location, content, and discipline. This study is specific to state universities in Cameroon. However, it can be used by private universities.



### **0.6.1 Institutional Delimitation**

The study is delimited to state universities in Cameroon. The researcher selected the University of Yaounde 1 due to financial constraints, accessibility and implementation of the concept of sustainable development. There are eleven public universities in Cameroon which are: **university of Yaounde 1, university of Yaounde 2, university of Douala, university of Bamenda, University of Buea, University of Maroua, University of Dschang, University of Ngaoundere, university of Ebolowa and university of Garoua**

### **0.6.2 Time Delimitation**

This research project ran from 2020-2024. These four years were characterized by intensive seminars and active fieldwork. The period helped the researcher to have an in-depth mastery of the challenges of sustainability governance that affected students' competency.

### **0.6.3 Theoretical Delimitation**

The following paradigms, models and theories were used to explain the concept and ideas, which link the variables. We have the paradigms of organizational structures. Concerning the theories, they include: Niklas Luhmann system theory, Stakeholders theory, Responsible management, learning paradigm and the adsorptive capacity model.

### **0.6.4 Thematic delimitation**

This study is specific to the field of educational management, specifically to school administration, environmental science, governance and policy, management of natural resources and sustainable development. The study is delimited on one hand to sustainability governance conceptualized as: university sustainability politics, university sustainability culture, university sustainability practice, university sustainability knowledge, university sustainability management strategy and on the other hand, competence for sustainable development conceptualized as; knowledge, attitude and behavior. Analyzing the factors of sustainability governance that have an effect on competency in state universities is a new concept and it is known to be an important mechanism to meet the developmental objectives of the universities in training citizens who are rooted in their culture. The content focus specifically on sustainable university governance and competence for sustainable development.

## **0.7 Presentation of the study**

The study is made up of two Parts and a general conclusion. The study begins with a general introduction, followed by part I, which comprises chapter I, II and III then followed by



part II, made up of chapter IV and V and a general conclusion. The general introduction presents, the context, problematic, research questions, objectives, interest, significance and delimitation of the study.

**Chapter I:** Chapter one of the study focuses on the conceptual and theoretical framework of the independent variable; this chapter focuses on Sustainable University Governance, models of governance suitable for sustainability governance, dimensions of sustainability governance (university sustainability politics, university sustainability culture, university sustainability practice, university sustainability knowledge, university sustainability management strategy) and the concept of sustainability governance in state universities.

**Chapter II:** This chapter focuses on the conceptual approach and theoretical framework of the dependent variable, that is students' competency for sustainable development, and the various theories used to support the work. It begins with the concept of sustainable development, models of sustainable development, education for sustainable development, and continues with the concept of competence for sustainable development, approach, types and forms of competences, students' competences and the various theories that support the studies.

**Chapter III:** This chapter presents the following aspects of methodology, the area of study, the research design, the population, the sample size and sample techniques, the research instruments, reliability and validity of the instruments, administration of the instruments, data analysis technique, and recapitulative tables.

**Chapter IV:** This chapter presents the result of data analysis, descriptive and inferential statistics.

**Chapter V:** This chapter presents discussion of the results, suggestions and recommendations of the study. After the following chapters, the study ends up with a references and a glossary.



**PART ONE**  
**CONCEPTUAL, EMPIRICAL FRAMEWORK AND**  
**THEORETICAL REVIEW.**



**CHAPTER ONE**  
**SUSTAINABLE UNIVERSITY GOVERNANCE**



This chapter presents the following: The concept of Sustainable University Governance, concepts such as university sustainability politics, university sustainability culture, university sustainability practice, university sustainability knowledge, university sustainability management strategy, models and theories used in the explanation of Sustainable University Governance.

Sustainable university governance had its origin in the growing awareness of the need for environmental stewardship and sustainability of resources. The concept emerged as a response to the increasing recognition of the impact of human activities on the environment and the urgency of taking action to address these issues. The early origins can be traced back to the environmental movement of the 1960s and 1970s, which led to the creation of environmental protection laws and policies. In the context of higher education the origin of sustainable university governance can be linked to the growing interest in sustainability within academic institutions. The United Nations' Brundland Report of 1987, which defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs," played a significant role in shaping the discourse around sustainability governance in universities.

Furthermore, the Earth Summit in Rio de Janeiro in 1992 and the subsequent establishment of the UN's Agenda 21 provided an impetus for institutions and governments to integrate sustainability principles into their operations. As a result, universities began recognizing their responsibilities in addressing global sustainability challenges by preparing future leaders and professionals to contribute to sustainable development.

Since then, the concept of sustainable university governance has evolved significantly over time. Initially, universities incorporated sustainability through the work of dedicated individuals, however inadequate understanding of the interconnectedness of environmental, social and economic issues led to a demand for more clarity, which resulted in the formalization of a framework to manage and address these issues within the university, now known as Sustainable University Governance. Many universities established sustainability officers or departments to coordinate and implement sustainability initiatives across various campus operations, such as facilities management, curriculum development, research, and community engagement. These offices often work in collaboration with various stakeholders, including students, staff, and partners, to develop and implement sustainability plans and programs.



The development of sustainable university governance has also been influenced by the emergence of sustainability reporting frameworks and assessment tools, such as the **Sustainability Tracking, Assessment and Rating System (STARS)** developed by the **Association for the Advancement of Sustainability in higher Education**. The framework has provided universities with guidelines for measuring and communicating their sustainability performance and has encouraged the integration of sustainability principles into university governance structures. Moreover, the growing recognition of the importance of sustainability in higher education has led to the redefinition of governance within universities to incorporate sustainability principles.

According to Le Gales (2011), governance is viewed as a process of coordinating actors, social groups, and institutions to attain particular goals. Thus, governance relates to all the institutional networks, directives, regulations, norms, political and social practices. (Le Galès, 2011, pp. 142-159). Governance also refers to the operational management of institutional processes and mechanism. In university management, it concerns the implementation and control of training processes. This implies redesigning university operations to provide better training services. Managers at this level monitor the day-to-day activities of staff and prepare the way for students to have better career prospects.

According to Kezar and Eckel (2004), governance is a multi-level concept with different bodies and decision-making processes. At the micro-level policy decision-making is mostly observed. According to these authors, “Governance in education is the term given to the structures and processes that academic institutions invent to achieve an effective balance between the claims of original controls and influence”.

There are numerous issues that managers at the operational level encounter to ensure that students are prepared daily at the university. The three most significant challenges faced are how to handle globalization, sustainability and governance in the operational activities of the university. Addressing the impact of globalization on the competencies of students in state universities is difficult. As such, aligning students’ skills to a global perspective requires commitment from university managers. This ensures that their framework aligns competencies with a global perspective to resolve globally inclined issues locally.

Evaluating whether the university is effective and efficient in providing this framework while maintaining existing competences without compromising future competence is important for most stakeholders. That is, competence aligned with sustainability values is an aspect of



governance that seeks to determine whether the university is accountable for the types of competencies that it develops or not. Effective governance requires the implementation of best practices for proper accountability. There are many types of governance that can foster sustainable development. However, we will limit our focus to sustainability governance.

➤ **Democratic Governance**

Democratic governance emphasizes the importance of transparency, accountability, participation, and access to justice. It ensures that marginalized groups have a voice in decision-making processes that affect their lives. This type of governance can foster the development of policies and institutions that promote sustainable development.

➤ **Participatory Governance**

Participatory governance involves the active participation of citizens and civil society organizations in decision-making processes. It empowers people to contribute to the development of policies that affect their communities. This type of governance can provide insights into the needs and priorities of local communities and lead to the development of sustainable solutions.

➤ **Market-based Governance**

Market-based governance relies on the private sector to drive sustainable development. This can take the form of environmental regulations, incentives for sustainable business practices, or investment in renewable energy. This type of governance can create economic opportunities for sustainable development while incentivizing businesses to reduce their environmental footprint.

➤ **Global Governance**

Global governance involves international organizations and agreements that promote sustainable development. These agreements those related to climate change, biodiversity, and sustainable development goals. This type of governance can provide a framework for global cooperation and coordination on sustainable development.

➤ **Sustainability governance**



Sustainability governance refers to the processes, policies and procedures implemented by organizations to ensure that their operations prioritize sustainable development. It involves the integration of environmental, social and economic considerations into decision-making processes to achieve lasting, positive outcomes for individuals, society and the planet. Effective sustainability governance requires commitment at all levels of an organization, from senior management to frontline staff. It involves establishing goals, targets and performance indicators that align with environmental and social benchmarks while monitoring progress towards achieving those objectives.

Sustainability governance also entails engaging stakeholders in the decision-making process. This includes collaborating with community members, customers, employees and suppliers to understand their environmental and social concerns, then incorporating this feedback into their sustainability strategies and programs. In addition, sustainability governance requires transparency and accountability. Universities must communicate openly about their sustainability priorities, progress and challenges, and be willing to receive feedback and input from stakeholders. This helps create a culture of continuous improvement and drives innovation towards sustainable practices. Overall, sustainability governance is a critical component of organizational success in the twenty-first century. As the world becomes more interconnected and global challenges such as climate change, resource depletion and social inequality become more urgent, universities that prioritize sustainability will be better positioned to thrive in the long term.

On the other hand, sustainable university governance refers to the strategies, policies, procedures, and programs that promote sustainable practices in higher education institutions. The governance structure typically involves multiple levels of decision-making, including departmental, individual staff, and students levels.

Sustainability governance can involve a range of approaches, such as:

- Establishing a sustainability committee or officer responsible for overseeing sustainability initiatives across the institution.
- Developing a sustainability policy that outlines the university's commitment to sustainability and sets targets for reducing its environmental impact.
- Conducting sustainability audits to identify areas where the institution can improve its environmental performance and reduce its carbon footprint.



- Offering sustainability training and education programs to staff, students, and the wider community.
- Creating partnerships with local businesses, governments, and community organizations to promote sustainable practices and drive changes.

Universities around the world are moving toward sustainability governance because of fundamental changes across the economy, society and the environment. Thus, the re-orientation of their values, norms and standards must accompany the shift toward sustainable development. That is, their sustainability politics, “policies,” culture, practices, knowledge and management strategy must be adapted to develop new knowledge and skills so that all students acquire the competencies needed to promote sustainable development. Education for sustainable development anchors sustainable lifestyles by ensuring that learners obtain competencies and skills that enable them to promote a green economy by developing carbon-free enterprises, advocating human rights, gender equality, culture, peace and non-violence, while appreciating cultural diversity. In order to ensure that the goals and objectives of Education for Sustainable Development (ESD) are accomplished in universities, there is a need for coherence between ESD policies and the university’s policy. It is assumed that universities must address several aspects of their system. These key factors help frame the effective implementation of ESD by integrating sustainability into the curriculum to enhance students’ competency, providing learning materials, and preparing the learning environment for students’ development.

Some schools of thought argue that it does not only necessitate “governance” but a specific type of governance known as sustainability governance, which is effective with proper coordination, accountability, monitoring, reporting, and an evaluation system. Others argue that appropriate university politics, culture, awareness, and visibility as factors of governance equalizer, which can foster sustainable development. According to Bauer (2018), sustainability governance refers to the coordination of institutional structures and the establishment of administrative mechanisms to manage complex environmental and social interactions within the institution. Meanwhile, governance for sustainable development refers to a set of mechanisms and processes that ensure rational decisions are taken within the universities to create value for the government and society.

However, good governance geared for training that enables the integration of sustainability programs in universities to foster sustainable development. Although these



competencies are described in different models, settings and strata of education, little information is available on training programs that can effectively develop students' competency for sustainable development in state universities in Cameroon. Analyzing how state universities are governed to develop students' sustainability competencies will be a novel contribution to educational research in Cameroon. The appeal for education to contribute to a sustainable society is an important challenge and a defining characteristic of twenty-first century higher education. Moreover, the UN Decade of Education for Sustainable Development (DESD) in its last phase, focused on the integration of sustainability issues in education at all levels via a holistic, inter- and trans disciplinary approach with a clear focus on values. So far, many approaches, methods, and techniques has been used for training in both private and public institutions. However, few positive results have been obtained, leading to an ongoing debate on the most suitable models of governance needed for training. Nevertheless, effective sustainability governance can help universities achieve their sustainability goals, reduce costs, and improve community engagement. It can also help universities stay relevant in an era where environmental issues are becoming increasingly important to students, faculty, and the wider community.

### **Key Principles of Sustainable University Governance**

In order to promote effective Sustainable University Governance, it is essential to adhere to a set of key principles that guide decision-making and promote institutional effectiveness. Some of these principles include:

**Accountability:** The university must be accountable to its stakeholders for the use of resources, the achievement of academic goals, and the fulfillment of its mission.

**Transparency:** The university must be transparent in its decision-making processes, policies, and practices, and has to communicate openly with its stakeholders.

**Inclusivity:** The university must involve faculty, students, administrators, and external partners in governance and decision-making processes, ensuring that diverse perspectives are taken into account.

**Integrity:** the university must uphold high ethical standards, promote academic freedom, and ensure that all activities are conducted with honesty and integrity.



**Effectiveness:** The university must establish clear goals, metrics, and processes for evaluating governance structures and practices, and should continuously improve their governance systems to enhance institutional effectiveness.

### 1.1. The concept of Sustainable University Governance

The concept of Sustainable University Governance in this research suggest a specific framework that can be used to enhance students' competency in education for sustainable development in Cameroon. The aim is to reduce unsustainable practices. This concept is structured around university sustainability politics, university sustainability culture, university sustainability practice, university sustainability knowledge, and university sustainability management strategy.

Only a few state universities in Cameroon address sustainability in their programs, teaching, practice, training, research and governing mechanism. To date, there is no satisfactory agreement on how the demands of sustainability should be utilized as a mechanism in the context of state universities for building sustainability skills and competencies to address social, economic, and environmental issues.

Sustainable university governance in this research is proposed as an innovative framework that can be used to integrate sustainability into university management practices to foster sustainable development in students' programs and skills. Therefore, there is no widely accepted, concrete, and specific definition of the term in the context of education. However, to develop the concept of sustainable university governance, the definition of governance cannot be bypassed. Thus, this study emphasizes the definition of governance in higher education as: **“structures, processes, and procedures under which universities are directed and controlled”** (O'Malley, 2021). Defining governance in this way situates the concept within an educational framework, where it is recognized that governance influences how an institution sets and achieves its objectives in relation to training for sustainable development. Furthermore, many authors have attempted to establish a concrete definition for the concept.

According to Leal Filho, W. & al., (2021), governance for sustainable development is interpreted as the provision of adequate policy framework characterized by reliability and accountability, along with resources to support its implementation. The authors also describe it as the responsibility of coordinating the processes and efforts of individuals within the institutional structures to promote sustainable development.



Wals & al., (2016), the concept of sustainability governance suggests two models of governance and three key dimensions of sustainability. These include hierarchy and bureaucracy as a governance model for sustainable development, with society, economy and ecology constituting the dimensions of sustainability.

Nevertheless, the intersection of these governance models could lead to a model that encourages the integration of sustainability within a framework. Bauer & al., carry out research in developed countries with the aim of analyzing certain factors identified as principles - that is, factors considered to facilitate or ease the integration of sustainability in the framework of the university. To the authors, the factor ranges but are not limited to university politic, culture, knowledge, organizational structure, and management strategy.

However, in the framework, the factors viewed as principles are normative. As normative principles, they do not define what should be included in a sustainability framework as a governing mechanism nor what actions should be taken to promote sustainable development within universities.

In contrast to state universities in the developing world, the conceptualization of sustainability in university strategy can provide the basis for effective implementation of its action plan, and activities which are indispensable for enhancing students' competency. For example, some private universities in Cameroon present a traditional framework for the integration of sustainable development principles into research and training to strengthen students' competency.

However, according to Lange P. & al., (2013), the main issue is whether sustainability represents a competing interest or a converging interest where collaboration may lead to overlapping benefits. For example, focused initiatives that could be considered in university policies, and prove beneficial for sustainable development include the Earth Charter, the Paris declaration and the Luneburg declaration. Lange et al. further noted that for governance outcomes (whether aligned with sustainability or not) to effectively promote sustainable development, a clear strategy must be in place.

According to Adger, J., (2009), the form of governance and its transformative capacity determine the knowledge and action required for sustainable development. If well-coordinated and effectively directed, the framework can achieve the objectives of sustainable development. This requires a variety of governance mechanism that departmental heads must employ to facilitate interdisciplinary interaction.



Lange, P. et al., (2019), examined some modes of governance that could facilitate the integration of sustainable development in universities. The authors analyzed interactive processes and mechanisms, ranging from hierarchically centralized governance models in some public-private organizations to self-governance models in public organization. They concluded that only an appropriate model integrating sustainability can foster sustainable development. Meanwhile Bauer & al. (2018) focused on the five dimensions of sustainability governance. The dimensions include; politic, profession, organization, knowledge, and visibility. They demonstrated that the successful integration of sustainable development principle depends on these five governance equalizer indicators.

Leal Filho, et al. (2020) highlighted in European context, indicators such as sustainable development policy, certification, organizational structure, budget, reports, and sustainability teams are to integrate sustainability within traditional university mechanisms. In contrast, African university governance structures are hierarchical, where staffs members cannot rely on legal guarantees of academic freedom for decision-making. This suggests that the traditional university governance mechanism is structured in a decentralized manner, with divisions promoting specialization.

Strengthening the role of university management in sustainability efforts can help allocate resources and implement policies that integrate sustainable development programs for training students with the necessary competencies to address environmental, economic and social challenges. This goal can be achieved by establishing central institutional units such as executive committees, reinforcing mission statements, and implementing guidelines throughout the University for Sustainable Development.

The university comprises specific areas of responsibility with clearly defined actions, authority, administrative procedures, norms, and principles across faculties and academic disciplines. Key administrative figures include the rector or chancellor as the head of administration, deans, department heads, students in various disciplines, research and teaching staff, and university employees. Coordinating these different university departments ensures alignment with sustainability principles and practices. However, the system's success is heavily influenced by governance factors such as university politics, culture, knowledge, practices, and management strategies. Each of these factors will be analyzed to determine their impact on students' competency within the framework of the University for Sustainable Development.



### **1.1.2. University sustainability politics**

Sustainability politics has gained prominence in recent years as the need to address environmental issues has become increasingly urgent. Governments and organizations worldwide have implemented measures and policies to foster sustainable development. At its core, sustainability politics aims to ensure that economic growth, social development, and environmental stewardship are integrated in a balanced manner. This requires taking a long-term perspective and making decisions that prioritize the well-being of future generations.

One key aspect of sustainability politics is the promotion of renewable energy and the reduction of greenhouse gas emissions. This entails investing in clean technologies such as solar and wind power, as well as enforcing regulations and providing incentives to promote their use. Beyond energy, sustainability politics also emphasize sustainable consumption and production practices.

This includes promoting the use of eco-friendly products and encouraging recycling and waste reduction. Furthermore, sustainability politics prioritize the protection and conservation of natural resources, such as forests and oceans, to maintain their ecological integrity for future generations. Overall, sustainability politics seek to balance economic growth with environmental responsibility and social equity to achieve a more sustainable future.

Applying this concept to education, it becomes university sustainability politics. This approach seeks to enhance students' competency by incorporating social, environmental, and economic factors into university decision-making. It involves educating students about sustainability issues and promoting innovative research to develop sustainable solutions. University sustainability politics ensures that essential aspects of the global sustainable development agenda are advanced, positioning universities as key drivers of sustainable development through skills and research.

In this research, we posit that university sustainability politics serves as an ideal governance mechanism that, if effectively implemented, can foster Education for Sustainable Development (ESD). The political environment encompasses policies and regulations established by top university administrators, councils, senates, staff, and pressure groups that influence the university's decisions and actions within society.



Decisions related to universities are significantly influenced by the political landscape. For example, university sustainability officers are not only responsible for designing ESD policies, but they must also ensure that authority is granted for implementation. Similarly, they must guarantee that sufficient institutional resources and capabilities are allocated to effectively train students with the necessary skills. This implies that if university sustainability officers establish a strong sustainability policy and action plan to mandate ESD, but upper administration fails to support it, implementation will be highly challenging.

Moreover, providing ESD-trained faculty and ensuring the availability of ESD learning materials are critical to successfully implementing sustainable development programs (Kezar & Eckel, 2004).

University structures provide the legal and institutional framework through which administrative decisions are made for sustainability. Green institutional structures determine the extent to which sustainability reporting is done for proper accountability of sustainability officers while limiting the authority of various stakeholders whose views oppose sustainable development. Understanding these structures and barriers facilitates interdisciplinary and transdisciplinary programs for skill development. Without this mechanism, the personal views of pressure groups and heads of departments can impede university sustainability policies, culture, knowledge, and practices. Kezar points out that authority within these structures is crucial in guiding workers and preventing them from accepting individual freedom within the University for selfish motives, which often causes conflicts. Kezar et al. further show that these structures define the authority and limits of the council, senate, executive board, and administrative departments.

The structures that include sustainable development officers tend to have an additional framework to complement the traditional governance mechanism. These structures monitor and control all programs, for example, officers who have an understanding of sustainability-inclined programs. In addition, sustainability units appointed by the university management team can play an important role by forming contact points where they initiate, organize, and communicate activities in individual fields of action for administrative and research purposes, which greatly influence how students' competencies are developed indirectly. Additionally, there are decision-making or preparatory bodies such as steering committees, which deal with the selection of issues and engage in processes to train competencies. Several rigid structures



slow down the development of the university in terms of sustainable development (Bauer, 2018). The importance of a sustainability governance framework is that it helps departments implement university sustainability policies, programs, and action plans to meet organizational goals and achieve the objectives of sustainable development.

Filho, L. et al. (2021), in a study on seven critical dimensions of sustainability, showed that Liverpool John Moores University is clearly resilient in its comprehensive approach to reducing its ecological footprint through waste reduction. This has been possible partly due to significant accomplishments in policies for sustainable development principles and programs being implemented. For example, JMU's mission statements reflect a commitment to sustainability. In addition, political statements made by sustainability officers strongly influence how sustainability is viewed and considered in the university's framework, policy, culture, and action plan. In support of such strategies, students took the initiative to create awareness of the importance of the mechanisms put in place and the vision and mission of the university for the development of their country.

### **1.1.3. University sustainability culture**

Sustainability culture refers to a collective set of values, beliefs, and behaviors that prioritize actions aimed at preserving the natural environment, promoting social equity, and economic prosperity. It is a culture that strives to promote responsible and ethical practices that ensure the well-being of both current and future generations. University sustainability culture, as a mechanism to enhance students' competencies, refers to the overall beliefs, attitudes, and behaviors that promote environmental sustainability within an academic community. This involves creating a culture that values and prioritizes sustainability initiatives, such as reducing waste and increasing energy efficiency among students.

University sustainability culture includes various initiatives and programs, such as:

- Sustainable practices in buildings and operations, including green buildings, energy-efficient buildings, and alternative energy use.
- Sustainable transportation programs such as bike-sharing and carpooling, as well as public transportation discounts and incentives.



- Sustainable waste reduction programs that focus on recycling, composting, and waste reduction campaigns.
- The curriculum integration of sustainability themes across various disciplines such as political science, management, engineering.
- Community engagement and outreach initiatives that focus on promoting sustainable lifestyle changes and sustainability ethos among stakeholders.

A strong sustainability culture in universities can help inspire students to educate the present and future generations on environmental responsibility, which helps bring about the management of global challenges such as the climate crisis in different nations. Sustainability culture acknowledges the need for a shift towards a more sustainable way of living, where resources are used efficiently, waste is minimized, and the impact on the environment is reduced significantly. This culture within universities recognizes that the health of the planet and its ecosystems is crucial to everyone's survival and well-being.

Sustainability culture requires collaboration and participation from managers, students, and all other members of society. It involves active engagement in promoting sustainable practices, such as reducing energy consumption, reducing waste, and adopting eco-friendly transportation methods. Moreover, sustainability culture includes ethical practices that promote social equity and economic prosperity. It is a culture that values diversity, promotes fair labor practices and equal opportunities for all, and ensures that the benefits of sustainable development are distributed equitably.

In addition, sustainability culture enables a fundamental shift in how both managers and students value their interactions with the environment, society, and the economy. It requires a commitment to responsible and ethical practices that consider natural systems and human well-being. As students work toward a more sustainable culture, they must acknowledge that it is not just a slogan, but also a fundamental shift in mindset and behavior to secure a better future for themselves and future generations.

According to Adams (2018), universities across the globe are giving priority to the challenges of sustainability, which is driven by various factors, including international and national policies accompanied by societal pressure. Today, many current initiatives focus on a relatively narrow set of activities, including technology and artificial intelligence for a culture. However, they have met with mixed success and have often overlooked the barriers that hinder



the importance of cultural change, thus making progress towards building and embedding a culture at the university.

Many scholars stress the significance of organizational culture in embedding sustainability. Trudel (2020) opines that what constitutes a productive culture in organizations pursuing sustainability is relatively unknown. According to the author, each individual member brings their own goals, values, beliefs, and attitudes into the organization's culture, which may or may not be consistent with the existing institutional culture. It is the institution's responsibility to later align individual goals, values, beliefs, and attitudes with the organizational culture.

Therefore, if a university promotes sustainable development through its governance framework, those who find their values incoherent with the culture will exit the system and return to the external environment. While sustainability values have intrinsic importance among organizational members, it is asserted that sustainability values must also be culturally embedded through organizational and personal values.

In addition, some researchers argue that, within a single organization multiple subcultures can co-exist (Linnenluecke, M. & al., 2010). This may be occupationally, geographically, hierarchically, or functionally-based. The authors, showed the existence of three cultural levels in an academic profession and indicate that the university has similar cultures like that of complex organization such as companies, and non-government organization with a framework that can easily integrate sustainability culture.

Conversely, Adams, K. & al. (2021). Studied the notion of 'organized anarchy' and argues that most universities do not have a sustainability culture but are better characterized by conflict and lack of coherency, described as 'academic culture' one that is characterized with high levels of individual autonomy in teaching and research. On this basis, multiple sub-cultures can be anticipated to co-exist within the university each potentially holding different orientations for the implementation of sustainability as a culture.

Within universities, cultural influences occur at many levels, between departments, across categories of employee, between staff and students. However, the authors, recognize multiple stakeholder approach as focus on academic disciplines, which identifies students, non-teaching staff, external stakeholders and partners' principles and values as important for a sustainable culture. For example, one of the managerial strategies, which over the years has become a



sustainability culture, is the constant organization of green competition allowing students to use technology to develop smart buildings, recycling programs and campaign programs to promote energy saving practice. Another approach used by the Business school in Malaysia is the inclusion of ethics and community project into the syllabus as subjects to positively arm the students with the appropriate mindset to work for communal and environmental goods.

Adam & al. argue that, the values which green campus add to students enable them to learn in their collective society positively while encouraging them to find and exploit opportunities that will lead to the creation of sustainable enterprises. Therefore, a robust sustainability culture in the university can aid to inspire students to educate the present and future generations on environmental responsibilities, which help, bring about management of global challenges.

As such, drilling competence for sustainable development is greatly influence by the organizational culture. It is more likely for a university with sustainability embedded in its core value and strategy to inculcate the same values into students' competency. However, this is contrary for risk-averse universities with cultures that are shrinked. In such a culture, it will be difficult for managers to adopt innovative values.

This is the reason why it is said that, a university has a sustainability culture when it has the capacity to ensure its continuity and long-term culture and positioning in terms of value, skills in students' competency. Sustainability universities are those that focus on the development of a formula for profitability from a balanced approach, by creating responsible linkages with all stakeholders and the natural environment. Therefore, these universities are characterized by multiple orientation and complete commitment to sustainable development as a renounce principle for their culture.

#### **1.1.4. University sustainability practices**

University sustainability practices as a mechanism within the sustainability governance framework used to enhance students' competencies, refer to the measures and initiatives implemented by universities to minimize negative environmental impacts and promote social and economic development. Such practices aim to create a sustainable and resilient campus community that provides a quality learning environment for students.

University sustainability practices include:



- Green campus design and construction: Designing and constructing sustainable campus buildings that meet energy efficiency and environmental standards.
- Energy efficiency: Reducing energy consumption through installation of LED lights, solar panels, and other energy-efficient equipment.
- Sustainable transportation: Encouraging the use of public transport, walking, biking, and electric vehicles. This includes providing bike storage facilities and promoting carpooling among staff and students.
- Resource management: Conserving water and reducing waste by implementing recycling programs, composting, and reducing the use of single-use plastics.
- Sustainable procurement: Encouraging the purchase of environmentally friendly and socially responsible products and services
- Sustainability education: Integrating sustainability into the curriculum, offering courses and programs on sustainable development, climate change, and environmental sciences.
- Community engagement: Collaborating with the local community and other stakeholders to promote sustainable practices beyond the university.

Overall, university sustainability practice plays a vital role in promoting sustainable development locally and globally while preparing students to be responsible global citizens.

According to Miska (2018), sustainability practices are activities that universities implement to contribute to economic, social, and environmental sustainability. Therefore, university Sustainability Practices (SP) refer to the activities that both the university and students engage in to contribute to the economic, societal, and environmental aspects of the community while satisfying the present and future needs of stakeholders. It is unsurprising that universities with a strong sustainability orientation engage in green practices to improve the quality of employees and benefit larger communities through the quality of the students they train.

Furthermore, the need for autonomy can be linked to the willingness to participate in sustainability activities and create sustainability values. According to Ryan et al. (2020), by carrying out sustainability practices, students are intrinsically motivated to build virtues for the well-being of the environment while simultaneously addressing sustainability challenges and exploring opportunities for their long-term viability and well-being.



However, the level of awareness of environmental care among university students and society is still low in Cameroon compared to developed countries such as Denmark and Germany. According to Jusoh et al. (2018), the achievement of government commitments and efforts to implement developmental projects that are environmentally friendly—such as the construction of energy-saving infrastructure and public facilities like classrooms, hospitals, and schools—is directly related to the sustainability values inculcated in students who later become employees. The level of environmental awareness, both in knowledge and practice, is reflected in the application of students' competencies in the conservation of vital resources such as water and electricity.

State universities that are more sensitive to environmental issues achieve a balance between environmental responsibilities and the demands of external stakeholders. This is observed when the majority of their students display effective knowledge of economic practices without losing sight of the importance of conserving the environment. Such knowledge demonstrates their competencies when cooperating with environmentally friendly suppliers to meet infrastructure goals. Moreover, their opinions are needed to implement sustainable development principles, as this involves not only government institutions but also requires support from professional groups, public sectors, environmental organizations, and individuals in society. Consequently, environmental issues remain a current concern, even though they have long been debated. Therefore, the need to build new skills and competencies will continue to drive changes in practice to conserve the environment and make it a healthy place to live.

Thus, through environmental campaigns, students are exposed to sustainability issues that highlight threats and potential outcomes for future generations. Business experts are exposed to programs and activities that enable them to produce products and services that support environmental and community sustainability.

Hence, since social acceptance is an important reward and students possess a strong innate passion for autonomy, which involves having alternatives for their well-being, sustainability practices and their associated rewards can positively affect students' competencies, thus creating sustainability values.

#### 1.1.5. University Sustainability knowledge



Sustainability knowledge, embedded in a sustainability framework to enhance students' competency, refers to knowledge about caring for and protecting society and the environment, as well as creating new products for the economy. There are many types of environments that university managers need to understand in order to harness their benefits and improve students' skills at the university. These environments include, but are not limited to, social, cultural, economic, technological, and political environments. Using a framework that embeds these various environments in the governance mechanism will facilitate the development of policies and programs that tailor students' competency to environmental, economic, and societal challenges.

New knowledge for a sustainable society can be generated by observing consumption habits or the actions of cultural forces that influence the attitudes and behaviors of a group of people toward the consumption of particular products or their engagement in projects and services for societal well-being. On the other hand, students' knowledge developed from the cultural environment for sustainable development is generated through a mixture of economic and environmental elements that reflect society's beliefs, customs, values, laws, and behavioral patterns learned from parents and other members of society. Understanding the cultural and social environment is particularly important for cross-cultural knowledge, programs, and management systems.

For these reasons, university managers must seek to understand the importance of cultural characteristics so that the right knowledge is transmitted to students, thus developing students' competence in the three spheres of sustainable development. As a result, university managers should not impose their behavior or norms on students from other cultures because culture is built upon systems of values, beliefs, and attitudes. For instance, waste management, climate change, water conservation, electricity use, peace, equality, equity, and justice are areas where new and appropriate knowledge can be developed to build sustainability literacy, enhance well-being, and promote community living (Bapoo, M.A., et al., 2022).

However, to achieve sustainability literacy, both administrators and students need to gain sustainability knowledge. This knowledge is gathered from society, the environment, their courses, and lessons, combined with exposure and previous experiences. Once obtained, this knowledge has a direct impact on their intentions, attitudes, and behaviors necessary to build entrepreneurial ventures and sustainability values. Additionally, gathering sustainability knowledge from the community, workplace, or school can enhance students' and stakeholders' abilities, allowing them to discover new sustainability opportunities to explore and build



sustainability values. Eventually, sustainability knowledge aims to develop students' understanding of various socio-economic challenges.

Sustainability knowledge gained from a green curriculum enables stakeholders to identify environmental threats within their community. For instance, air pollution can provide valuable information that contributes to sustainability knowledge. Furthermore, sustainability literacy has become more accessible with the increasing use of technology and the internet, where students can easily access information about pollution indices in most countries (Bapoo, M.A., et al., 2022). Additionally, applying the social development theory of need suggests that sustainability knowledge is essential to fulfilling competency requirements. This implies that when students learn about sustainability issues, they feel competent enough to address challenges and sustain the ecosystem.

According to Leal Filho et al. (2020), sustainable development programs in universities require consideration of complex climate change issues to build knowledge. University actors must develop and share ideas about the problems at hand and their root causes. They must agree on how the situation should be evaluated and what future goals should be. It is also important to clarify which measures should be used to solve the problem. Beyond technical and professional expertise, knowledge of different actors' responsibilities, structures, and processes within the university plays an important role in clarifying how best to implement sustainability measures. Each solution usually presents specific advantages and disadvantages. Thus, deciding on the appropriate mechanism involves a normative judgment. It is insufficient for sustainability governance officers to access knowledge only in times of need. Instead, continuous identification, dissemination, and application of relevant knowledge are necessary to respond effectively to problems and facilitate long-term learning processes. This requires more than just technical solutions; it also demands collaboration and networking to support knowledge exchange.

According to Dodman (2016), knowledge and the criteria that determine its validity or relevance can be analyzed from three intersecting perspectives: motivations, types, and characteristics. The relationship between knowledge and action is largely defined by its characteristics, while the motivations behind knowledge influence the type of knowledge developed. These factors determine the nature of knowledge throughout human history and within individual experiences. The drive to acquire knowledge often arises from a desire to understand and a natural impulse to learn. This motivational framework highlights how



different types and characteristics of knowledge intersect in shaping human understanding (Bapoo, M.A., & al., 2022).

Recent history demonstrates how knowledge-building has become a tool for domination, power, and exploitation, sometimes undermining sustainability efforts. However, knowledge creation can also serve as a means of questioning assumptions, predicting outcomes, and exploring opportunities and risks. This reflective approach challenges the belief in the superiority of certain ways of knowing and acting.

Sustainable educational processes and systems must promote a vision that supports lifelong learning, personal development, and responsible citizenship. In this context, there is a crucial link between developing personal and social competencies based on respect, collaboration, and cooperation. Recently, there has been increasing attention toward interdisciplinary and transdisciplinary perspectives. As Popper (1963) stated, "We are not students of some subject matter, but students that are problem solvers, and problems cut right across the borders of any subject matter or discipline."

Similarly, Clark (2007) argues that sustainability science requires a perspective that brings scholars together to solve cross-disciplinary problems. It can be seen as neither purely theoretical nor purely applied research but as a field defined by the problems it addresses rather than by the disciplines it employs. It bridges knowledge and action dynamically.

Moreover, the expansion of academic disciplines sometimes limits vision and excludes individuals who lack specialized expertise. This can prevent the integration of alternative perspectives that offer different ways of knowing and acting. Educational processes should therefore emphasize interdisciplinary collaboration, where different disciplines and practitioners work together to develop new methodologies and approaches that go beyond the limitations of a single field.

The relationship between narrative and paradigmatic knowledge is also crucial. Narrative knowledge is experiential and often conveyed through storytelling, describing actions and events in particular contexts. knowledge mediated by verbal language. On the contrary, paradigmatic knowledge enables the creation of a new product that is objective and symbolic. Such knowledge enables an economic way of managing complexity and variability, rebuilding and structuring everything in terms of scientific concepts, rendering it subject to form logic and reasons that leads to categories networks that promote the empowerment of students.



The motivation for knowledge-building influences the type of knowledge developed. Traditional education systems have often prioritized disciplinary and paradigmatic knowledge that is global, objective, and product-oriented. However, interdisciplinary and narrative knowledge—characterized as local, subjective, and process-oriented—encourages awareness and responsibility. By embracing both interdisciplinary and transdisciplinary approaches, universities can empower students with diverse knowledge that enables them to tackle sustainability challenges effectively.

### **1.1.6. University Sustainability management strategy**

Sustainability management strategy in state universities integrates key sustainable development issues into sustainable university governance through university sustainability teaching and learning. The strategy also ensures that decision-making processes systematically foster a common understanding of sustainability in interdisciplinary and transdisciplinary contexts through teaching, learning, and cooperation with elite leaders of society. This approach aims to improve competency, particularly in Education for Sustainable Development (ESD), through student governing bodies, course lessons, and developmental activities. Enhancing ESD competency can be achieved without incurring high costs or overhauling the existing teacher development system.

Kezar et al. (2004, pp. 371–399) demonstrate that university structures define the authority and limits of the council, senate, executive boards, faculties, and administrative departments. The experience of numerous universities indicates that these structures can vary significantly. For example, offices with volunteer students or dedicated sustainability offices with student sustainability officers can drive the sustainability process forward. In addition, sustainability units appointed by university management and staff play an important role by serving as central points for initiating, organizing, and communicating sustainability activities across key areas such as projects, teaching, administration, and research.

Furthermore, decision-making or advisory bodies, such as steering committees, are involved in selecting key sustainability issues and integrating them into training programs to develop competencies. However, several rigid structures can hinder university development in terms of sustainable practices (Bauer, 2018, pp. 491–511). A well-defined sustainability governance structure is crucial, as it helps departments implement university sustainability policies, deliver services effectively, align with organizational goals, and contribute to the overall objectives of sustainable development.



**EMPIRICAL FRAMEWORK OF UNIVERSITY  
SUSTAINABILITY GOVERNANCE**



University governance is a critical aspect of higher education institutions, as it dictates how decisions are made, policies are implemented, and overall operations are managed. This review explores various perspectives on university governance, focusing on key principles, models, and best practices identified in academic literature.

One fundamental principle underpinning university governance is accountability. According to Baldrige, Curtis, Ecker, and Riley (2017), accountability in university governance refers to the responsibility of governing boards and administrators to act in the best interest of the institution, its stakeholders, and the public. This includes ensuring transparency in decision-making processes, adherence to ethical standards, and the efficient use of resources.

Another essential aspect of university governance is the role of governing boards and their relationship with university management. Kuhn and Pettigrew (2017) discuss three main models of university governance: the collegial model, managerial model, and corporate model. The collegial model emphasizes shared decision-making among faculty, staff, and administrators, while the managerial model focuses on centralized decision-making by top administrators. The corporate model, on the other hand, adopts a business-oriented approach, prioritizing efficiency and accountability.

Regarding best practices in university governance, Kezar and Eckel (2018) emphasize the importance of shared governance, which involves collaboration and communication among various stakeholders, including faculty, staff, students, and administrators. They argue that an effective governance structure should incorporate multiple voices and perspectives in decision-making processes, ensuring inclusivity and transparency.

Overall, the literature highlights the significance of accountability, governing board roles, and shared governance as best practices. By adhering to these principles and models, universities can navigate contemporary challenges and ensure long-term sustainability and success.

However, linking university governance and sustainable development requires a well-defined university sustainability framework. According to Van et al. (2008), governance and sustainable development can be linked to better understand their interactions. The authors argue that perspectives on sustainable development range from ecological sustainability to quality of life considerations. Meanwhile, governance approaches vary between hierarchical governance and deliberative governance, depending on the level of societal actor involvement.



From these two typologies, Van et al. derive a framework for analyzing governance for sustainable development. They assert that this framework has significant implications for complex debates on sustainable development and governance, aiding scientists and policymakers in exploring relevant governance dimensions and setting a foundation for empirical analysis. The authors conclude that clarifying perspectives on sustainable development and governance models can enhance discussions and implementation strategies.

According to Ospian (2008, p. 5), various university governance models address pressing challenges in different higher education systems worldwide. Trakman (2008) asserts that university governance models are shaped by both endogenous and exogenous factors. Eckel et al., (2004); identified the following as key factors that influence the nature and type of governance models adopted by countries or universities: locus of control: that is whether direct control by central government or free and independent, self-governance; history of either the state and or the institution; participants (stakeholders); organizational culture and structure; staff and alumni, and educational content and processes. Ospian (2008, p. 5) further suggests that the governance models adopted in the past two decades have been dictated by factors such as governance influence, university size, funding sources, autonomy levels, and the need for efficiency and effectiveness in institutional governance.

Globally, universities have relied on three primary governance models: bureaucratic, shared, and political (McCauley, 2002). This is done for some institutions to have autonomy in their overall governance, which may distinguish them and lend them their purpose to fulfil their ultimate responsibility to the institution's survival and ongoing continuance. Today's universities see need for increased diversity on their governance boards, within the constraints of their by-laws, to allow for staff and student voices. The arguments of McCauley (2002, p.4) are reinforced by the observations of Kezar and Eckel (2004, p.282) that the flow of authority from top to bottom as exemplified in centrally controlled structures reflects how bureaucratic governance in some universities is. Several other shades of governance emerge as autonomy and central control fuse. Eckel and Kezar (2004) have classified such models as traditional models. Among the traditional models are the bureaucratic, the collegial and the political model. Kezar and Eckel (2004) identify several forms and levels of authority and compare different models of authority distribution among various countries. According to Clarks (1983, cited in Asimiran, 2009), these dimensions encompass control of policy and control of practice.



Asimiran (2009) suggests that university management reflects elements of collegial, bureaucratic, corporate, and enterprise governance models.

Issues commonly linked to sustainable development may, in fact, be governance-related challenges. Without explicitly defining governance models for sustainable development, stakeholders may miscommunicate or face mismatches between governance approaches and applied instruments, ultimately hindering sustainable development implementation.

## **1.2. Empirical review on sustainable university governance according to Beech 2017; Lozano 2013; Barth & al. 2007, Wiek & al. 2011; and Jusoh 2018**

Sustainable university governance has gained significant attention in recent literature. A systematic review conducted by Beech et al. (2017, p. 194) examines university practices related to sustainable governance. Their study highlights the importance of effective governance structures and mechanisms in promoting sustainability initiatives within universities. The authors emphasize the need for clear policies, strategic planning, stakeholder involvement, and continuous monitoring and evaluation for the successful implementation of sustainability governance.

Lozano et al. (2013, pp. 10-19) explore the role of declarations in higher education in enhancing sustainability leadership within universities. They argue that addressing the university system as a whole, rather than focusing solely on individual behavior change, is crucial for achieving sustainability goals. The authors call for universities to commit to sustainability principles and promote the integration of sustainability into all aspects of their operations, governance, and curriculum.

Barth et al. (2007, pp. 416-430) focus on the development of key competencies for sustainable development within higher education institutions. They emphasize that universities play a crucial role in fostering sustainability by equipping students with critical thinking skills, effective communication abilities, and the capacity to apply sustainability knowledge in real-world contexts. The authors highlight the need for curriculum reform, faculty training, and collaboration with external stakeholders to effectively integrate sustainability competencies into higher education.

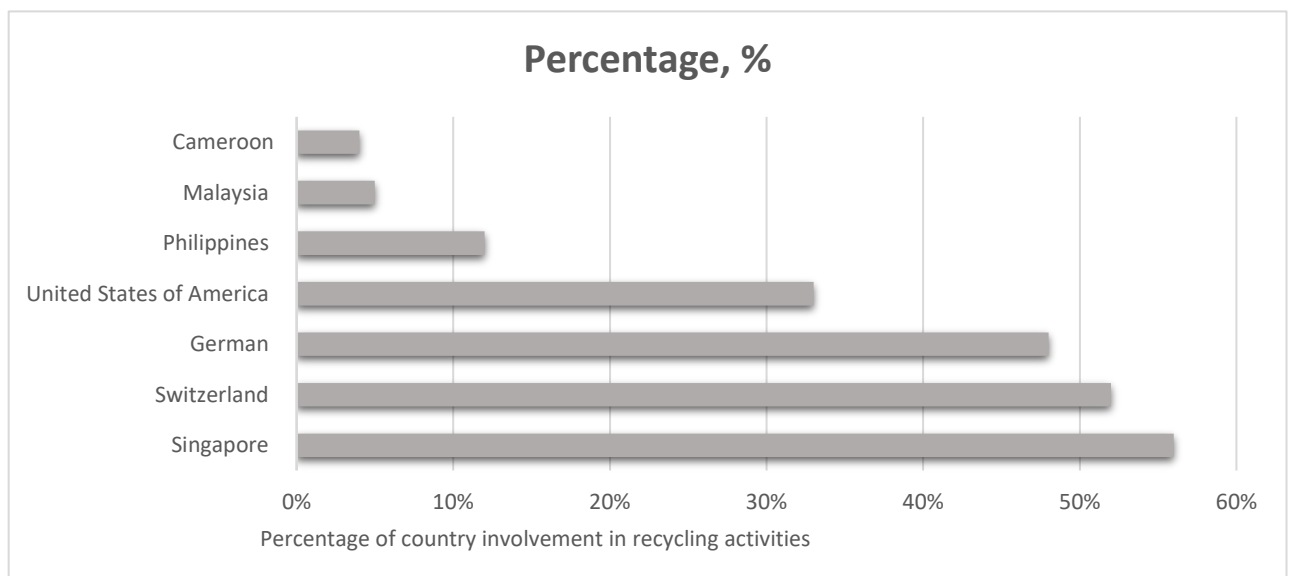


Wiek et al. (2011) propose a reference framework for academic program development in sustainability. They identify and describe six key competencies essential for sustainability education, including systems thinking, anticipatory thinking, strategic thinking, normative thinking, collaborative thinking, and action competence. The authors argue that developing these competencies in students empowers them to become change agents who can contribute to sustainable development.

Collectively, these scholars underscore the importance of organizational structures, strategic commitments, curricular integration, and competency development in Sustainable University Governance. Their work provides valuable insights and guidance for universities aiming to implement effective sustainability governance practices.

### 1.2.1. Trends of unsustainability practices in different countries around the world.

Waste management issues characterize many cities worldwide. According to UN Environment (2018), Africa currently recycles only about 4% of its waste, compared to higher recycling rates in countries such as Singapore (56%), Philippines (12 %) and some countries such as German (48%), the United States (33%), Switzerland (52%) and Malaysia. (Manga, E.V., Forton, O. T., Read, A. D., 2008)



**Figure 1: Percentage of countries involve in recycling activities**



Research findings show the need to assess the level of awareness of environmental practices among university students. This indicates that, to improve students' knowledge and practices in maintaining the environment, the university must create a certain degree of awareness to instill a positive attitude towards the environment.

At the university level, governance emphasizes teaching and research methods in the field of humanities and education, as well as experimental practices in the field of pure and environmental sciences. This is because students are exposed to direct experience with the environment and nature through hands-on activities, which directly enhance their knowledge and awareness of good environmental practices (Jusoh et al., 2018).

Additionally, at the university, sustainability practices play a proactive role in improving students' behavior to protect and preserve the environment. Furthermore, environmentally friendly suppliers, such as government agencies and non-governmental organizations, also play an important role in improving students' environmental practices. Through such partnerships, students can actively participate in addressing environmental issues collectively.

### **1.2.2. Review of governance according to: Perreault, T.; Blanc & Hamman**

Tom Perreault attempts to explain the concept of governance by distinguishing it from sustainability. Perreault explores different views on sustainability and governance worldwide. According to the author, sustainability is a normative principle that can be described as a benchmark for global and intergenerational justice in the face of challenges posed by current changes in the Earth's system. In ethical and political terms, sustainability is an open search mechanism or process with heterogeneous target dimensions that are pluralistic and culturally variable. Its objectives include sustenance, long-term responsibility toward environmental viability, social justice, and economic performance. Its systemic integration and implementation are necessary for comprehensive social transformation. One of its key strengths is that it can contribute both empirically and theoretically to knowledge building.

According to the author, ensuring the normative content of sustainability requires methodical analysis of societal problems, posing relevant questions regarding the relationship between humans and nature, thinking in cross-sectoral contexts, generating knowledge, and taking action. The goal is to determine sustainable solutions to address the great challenges of our time, both globally and nationally, and to implement them on a long-term basis at the institutional level. Thus, sustaining governance is essential for coordination.



According to Blanc (2009) and Hamman (2012), governance is used to characterize the kind of institutional framework required to carry out sustainability actions. It is sometimes introduced as the fourth pillar, ensuring the three pillars of sustainable development. Thus, governance enables the configuration of institutions while promoting an asymmetrical relationship with non-institutional actors. This challenges the classical way of envisioning sustainability as a three-pillar model (economic, environmental, and social), since it ignores the socio-spatial interdependence between territorialized systems.

Similarly, governance and sustainability are interconnected because they are complex constructs that combine a diversity of heterogeneous components. Gavin Bridge and Tom Perreault explain that the widespread use of the term "environmental governance" may stem from its ability to obscure critical distinctions. Like sustainable development and social capital, environment and governance are occasionally linked. Therefore, governance for sustainability is preferable to environmental governance. However, the vagueness and malleability of these terms result from a broad range of interests and ideological positions. As a result, the concept presents three common characteristics:

It is viewed as a public debate, which leads to a "politics of consensus." In this model, opposition to sustainability is rarely expressed, as it is presented as a means to save the planet, while governance is framed as a tool for achieving consensus in response to global threats.

It can be approached in three ways:

According to Gavin and Perreault, sustainability principles and goals serve the interests of governing bodies.

The managerial approach, where governing bodies define governance in response to environmental dilemmas, aiming to alleviate these challenges.

The political economy approach, where governance is understood as an essential process rooted in social relations of production, drawing from international relations theories.

In development studies, sustainability governance is seen as an intentional process, meaning an active intervention to achieve a specific outcome. It is viewed as environmental governance, which involves organizing decision-making related to the environment and establishing a social order through an administrative framework that prioritizes nature.



This approach presents a governance model that addresses the relationship between nature and society while respecting norms and a specific vision of the institution or society, in response to sustainability challenges.

### **1.2.3. Models of traditional university governance according to: Philippe Hamman and Bauer &al.**

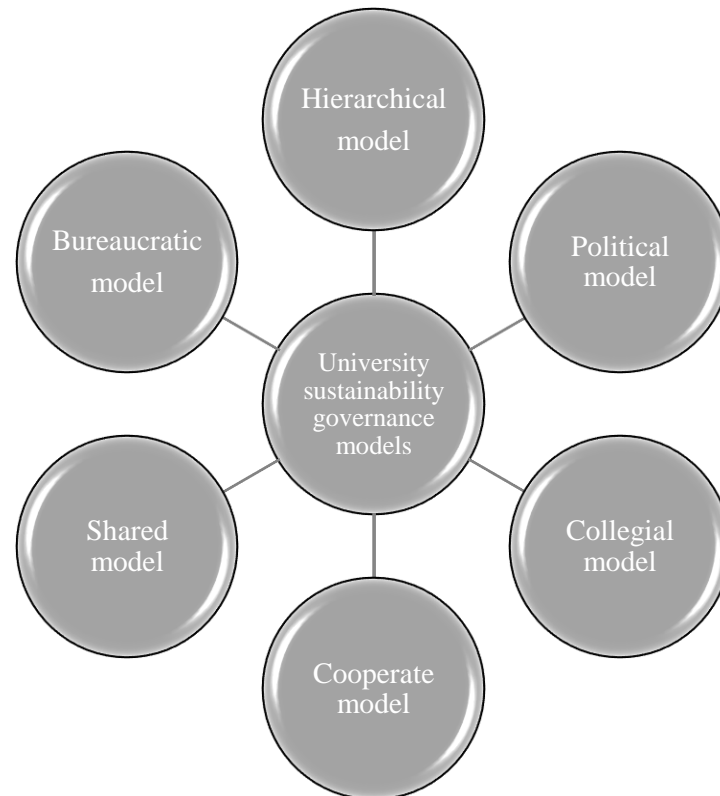
Universities can adopt various governance models to align with their specific needs and organizational contexts. Some institutions operate under a centralized governance structure, where decision-making authority is concentrated within a small group of administrators or a governing board. This model can streamline processes and facilitate quick decision-making, but it may also limit opportunities for faculty and students to engage in governance and influence institutional policies.

Conversely, some universities employ a more decentralized governance model, where decision-making authority is shared among multiple stakeholders, such as faculty senates, student councils, and department chairs. This model promotes transparency, inclusivity, and academic freedom. However, it can also lead to conflicts and delays in decision-making if consensus is not achieved among stakeholders.

Regardless of the governance model adopted, it is crucial for universities to establish clear mechanisms for communication, consultation, and decision-making. Additionally, governance structures should be aligned with the institution's mission, values, and strategic priorities. By fostering a culture of shared governance and collaboration, universities can harness the collective expertise of their stakeholders to address complex challenges and achieve their academic objectives.

There are several governance models implemented in universities. For this study, we will examine two specific models: the corporate model and the shared model of university governance.





**Figure 2: Model of governance adopted for university governance**

#### **1.2.4. Corporate model of university governance**

According to Lapworth (2004), corporate governance is the set of processes, customs, and policies affecting the way a university is directed, administered, or controlled as a corporation. Corporate governance highlights the relationship between the goals of stakeholders and those of the corporation established. It is commonly used in universities in the United States, such as the University of Chicago's School of Economics and Harvard Business School of Management According to Trakman (2008), the corporate governance model concentrates on managerial responsibilities, specifically those charged with the governance of the university. Corporate governance in universities derives from the business case model. Trakman showed that this model is grounded in a rational framework of corporate efficiency. Many schools of thought align with Trakman's view, agreeing that universities are governed by models which are inefficient and assume that corporate governance cannot address the deficiencies of most universities. They further argue that managers who adopt the corporate governance model run universities as business models, where decisions are justified by financial gain. According to Lapworth (2004), corporate governance includes several principles put forward to explain how organizations are managed. These principles are as follows:



Rights and equitable treatment of stakeholders.

- (i) Interests of other stakeholders.
- (ii) Integrity and ethical behavior.
- (iii) Role and responsibilities of the board.
- (iv) Disclosure and transparency.

Trakman (2008) identifies the following aspects of the corporate governance model implemented by universities outside the United States:

Chair and small board of governors or trustees directing the university.

- (i) Chief executive officer
- (ii) Chief operating officer
- (iii) Chief financial officer serving the board as the senior management team.

The author identifies the following as ideal times of implementing the corporate governance model: Times of severe economic difficulties.

- (i) The abolition of mandatory retirement.
- (ii) The decline in full fee-paying international students.

Trakman suggests that under the corporate governance model, professionals with experience in corporate policy and planning, and who are capable of managing the university efficiently, should be given the opportunity to govern. Universities like Oxford demonstrate that managerial governance produces goal-oriented managerial approaches. They emphasize a cost-benefit approach, where decision-making is considered unsuitable for governance and basic research, among other areas (Trakman, 2008).

On the other hand, Lapworth (2004) argues that the corporate governance structure is not a guarantee of success in business. Therefore, we should be skeptical of its ability to succeed in academia. According to Lapworth, the corporate governance model seems to ignore the need to examine and understand the nature of academic work, which requires substantial information. Furthermore, monitoring is costly, and accountability is difficult. The proponents of the corporate model focus on cost efficiency and financial returns rather than the core deliverables of a university. This makes the model less relevant to most universities. Even



though this model emphasizes the rights, transparency, and equitable treatment of stakeholders, it is business-oriented and does not account for the importance of structure in a university.

This model may work well in developed countries but is not suitable for developing countries because it does not address the importance of academics at the heart of the university. Contrasting this model with the shared governance model highlights a further decline in academic participation in governance. The shared governance model calls for shared responsibilities since the main aim of a university is teaching and research. Therefore, it is important to have a model that addresses the core objectives of a university. In the next sub-section, the shared governance model is examined.

### **1.2.5. Shared model of university governance**

Shared governance is a joint effort in the internal operations of an institution, and it is also characterized by certain decisions (Trakman, 2008). It is the process of distributing authority, power, and decision-making among constituencies. These constituencies include the board of trustees, staff, students, administrators, the academic or education council, senate, and various unions (Kezar & Eckel, 2004). Shared governance has existed for many years. Following the British model, the university council has been designed in such a way that it is as representative as possible, taking into consideration the interests of various groups. According to Kezar et al. (2004), the senate is responsible for the control and direction of teaching, research, and examination, as well as the award of degrees, diplomas, and certificates. However, the university council has the power to decide on matters that concern academics, and the senate has the duty to inform the council and the right and power to appoint the vice chancellor after consultation with the senate. Baird (2007) contends that governance calls for shared responsibility and mutual understanding among the various groups. The university board of directors, the senate, and the staff need to share decision-making, while in other areas, there should be a respectful degree of authority and power for everyone. Shared governance allows for joint effort, which can be achieved through collaboration with the representations that are determined by the university constitution.

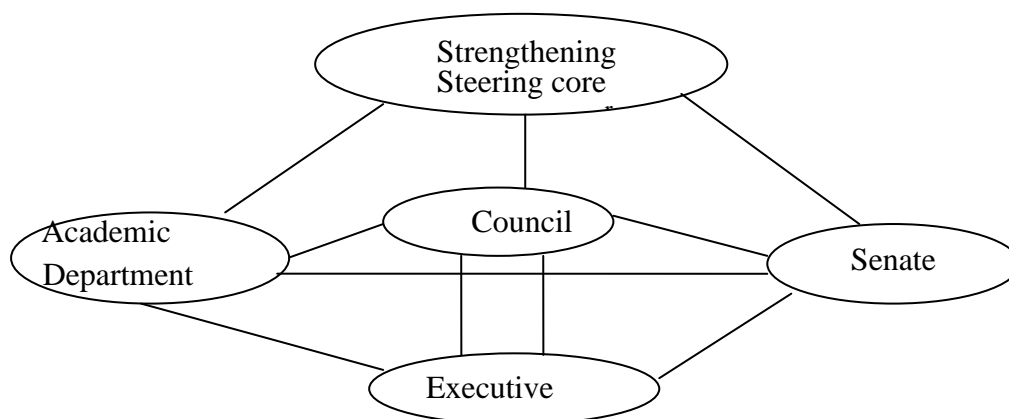
According to Trakman (2008), in shared governance, the board has considerable influence and power in the university's overall policymaking, but in academic matters, the power of the senate is more prevalent. At the same time, the general outline of the university's



purpose and objectives is always determined through consultation, whereby the board's authority is always recognized as stated in the consultation, in which the board has executive power over all affairs. The Senate's power, on the other hand, is respected in areas involving instruction, research, examination, the award of degrees, diplomas, certificates, and other academic matters.

According to Gayle et al. (2003), the inclusion and shared participation of members of each body within the discussions are intended to foster a respectful environment, as well as to expand the expertise and awareness of each group. Gayle et al. (2003) believe that shared governance is at the heart of any great university, as it reflects a general commitment on the part of staff, students, and administration to work together. The inclusion and shared participation of members from each body within the discussions of others are intended to foster this respectful environment, as well as to expand the expertise and awareness of each group.

Shared governance also promotes mutual respect and trust within the university community. The model seeks to strike a balance between cooperation and collegiality, whereby five important groups in the university—the strengthened steering core, the council, the senate, the academic department, and the executives—are linked together to govern the university. Figure 2 below describes Lapworth's model of shared governance. Lapworth (2004) argues that strengthening the steering core embraces the central managerial groups and draws on the strength of each group to drive the university, delivering a balanced approach to governance.



**Figure 3: Lapworth's model of shared governance. Lapworth (2004).**

However, in shared governance, many groups contest the process of determining the university's most important programs, and this can lead to many conflicts. At the same time,



different staff members may have different ideas, perceptions, and interpretations, which can slow the arrangement of the programs. According to Gayle et al. (2003), shared university governance remains under attack, and it is often blamed for the academic slow response to change, and it has become more difficult for many universities to adjust. According to Kavanagh (2000), as cited in Gayle et al. (2003), shared governance does not acknowledge the contribution of other stakeholders like the community, and yet the community contributes a lot to the growth of the university. Gayle et al. (2003) suggest that other members of the university believe that shared governance is inefficient and a barrier to important decisions. The top management should create and convey a strong sense of shared purpose. Gayle et al. (2003) suggest that although shared governance has been the norm for the last century, several authors have described governance patterns in the majority of institutions.

- (i) Share governance ignores the conflict of interest and adversarial nature in decision-making practices.
- (ii) Shared governance takes little account of the external forces.
- (iii) It does not consider the preservation of the environment, society and growth. It is therefore noted that shared autonomy only exists at elite institutions with powerful staff.

It is also noted that there are few shared goals at most institutions, the principle on which shared governance is built is on staff and students who are divided into different interest groups, with minimal consensus on issues. To be successful, shared governance requires commitment, time, and focused effort from all participants, including the board of trustees, administrators, staff, and students. Thus, in practice, shared governance is usually not easy. Based on the above background, shared governance is difficult, more especially for private universities. Thus, in practice, shared governance is usually not easy. Based on the above background, shared governance is difficult, more especially for private universities. In practice, shared governance seems to be usually impossible. From the above assertion, it is evident that there is no one single model that has all the elements to meet governance challenges that universities face. Seeking the best model that could be used in the university to foster sustainable development needs extensive research.

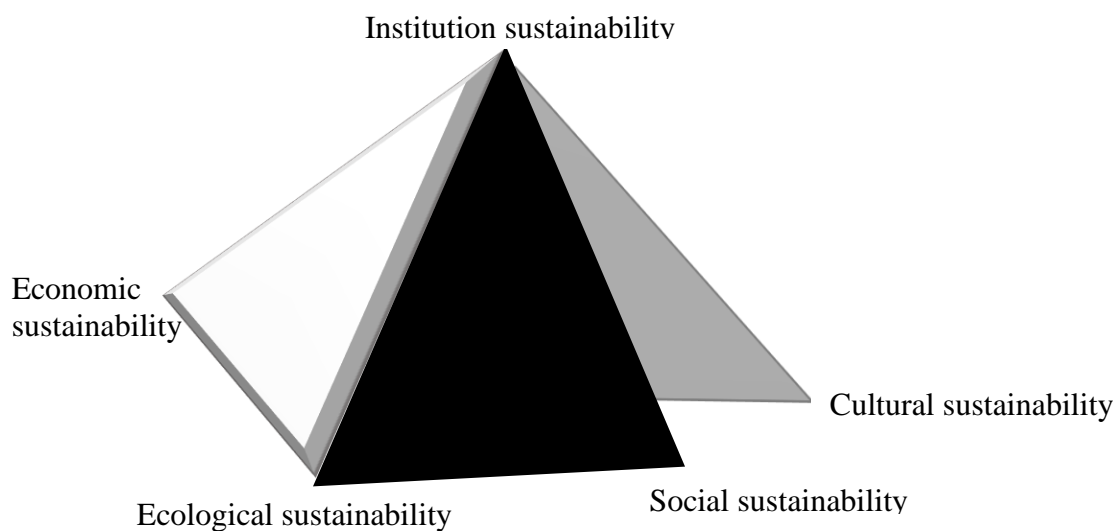


### 1.3. Review of a suitable Frame work for sustainability governance

#### 1.3.1. The prism model for sustainable development proposed by Spangenberg and Bonnoit

The prism adapted from Spangenberg and Bonnoit (1998), shows five dimension which are interconnected and interdependent. This model is often referred to as the five pillar of sustainable development. This prism stipulates that, to achieve sustainable development, it will require balancing of the five pillars.

- Economic sustainability (ensuring economic growth and development while minimizing environmental degradation and social justice)
- Ecological sustainability (conserving natural resources, protecting biodiversity, and maintaining ecosystem services)
- Social sustainability (promoting social justice, human right and community well-being)
- Institutional sustainability (governance, and policies to support sustainable development).
- Cultural sustainability (preserving cultural heritage, promoting cultural diversity, and supporting cultural exchange)



**Figure 4: Shows the Spangenberg and Bonnoit (1998) model of sustainable development**



Spangenberg and Bonniot's prism model (1998) shows a framework that provides a comprehensive and holistic approach to sustainable development, recognizing that sustainable development requires a balance through an integrated approach that considers all aspects of human and natural systems. It further shows the interlinkages between ecology, economics, society, institutions, and culture. According to the authors, a close look at the relationship between the dimensions is important to influence policy. In each dimension of the prism, there are imperatives such as norms for action. Indicators in this dimension are used to measure how far one has actually come in comparison to the overall vision of sustainable development.

Criticizing the prism of sustainable development, Robinson, J. (2004) argued that the model was too narrow and focused on economic growth, neglecting social and environmental aspects. Similarly, Jackson, T. (2009) challenged the assumption that economic growth is necessary for human well-being, and instead advocated for a more nuanced approach to prosperity. Reworth, K. (2017) argues that the model is too focused on growth and profit. The author suggested the "Doughnut economics" model, which prioritizes human well-being and environmental sustainability. Piketty, T. (2014), argued that the model fails to address issues of inequality and wealth distribution, which are critical for sustainable development. Klein, N. (2014), also showed that the model is too focused on market-based solutions, neglecting the need for systemic change and social justice.

The prism stipulated above suffered from many criticisms, similar to the three-pillar model. However, Spangenberg and Bonniot proposed the MAIN prism as a framework to analyze and understand sustainable development, emphasizing four dimensions, which include maintenance, accumulation, improvement, and nature.

Where MAIN stands for:

- M-Maintenance (Ecological sustainability): Conserving natural resources and protecting the environment.
- A-Accumulation (economic sustainability): Ensuring economics growth and development.
- I- Improvement (social sustainability): Promoting social justice, human rights and community well-being.



- N-Nurture (institutional sustainability): Establishing effective governance, institutions, and policies to support sustainable development.

#### **D. Atkisson's Pyramid**

The Atkisson pyramid was developed in 1999 with a framework for understanding and working with sustainable development. It emphasizes that sustainable development requires a strong foundation in ecological sustainability, and then builds upon that foundation with economic, social, institutional, and cultural sustainability. Each level is interconnected and essential for achieving sustainable development. It consists of five levels, represented as a pyramid.

- Foundation: Ecological sustainability (protecting the environment)
- Resource use: Economic sustainability (managing resources)
- Social justice:(promoting equity and justice)
- Participation: Institutional sustainability (ensuring participation and good governance) from ideas to reality
- Awareness: (Cultural sustainability) From workshop to real world

The prism of sustainability is not a causal model; rather, it is a heuristic device to facilitate discussion and analysis. To capture this consideration, the prism cuts across many fields and contexts such as natural and socio-cultural contexts. Moreover, different disciplines employ different terms to analyze and interpret the prism, so the way the device is understood and applied by researchers from different traditions will vary to some extent and refer to different elements and interpretations. Such differences reveal some of the complexities involved in developing a multi-disciplinary approach to sustainability governance.

Both frameworks emphasize the importance of effective governance in achieving sustainable development. They highlight the need for institutions to support and nurture sustainable development through policies, laws, and regulations that promote ecological sustainability, economic growth, social justice, and cultural awareness.

#### **1.3.2. The link between the prism model and sustainability governance**

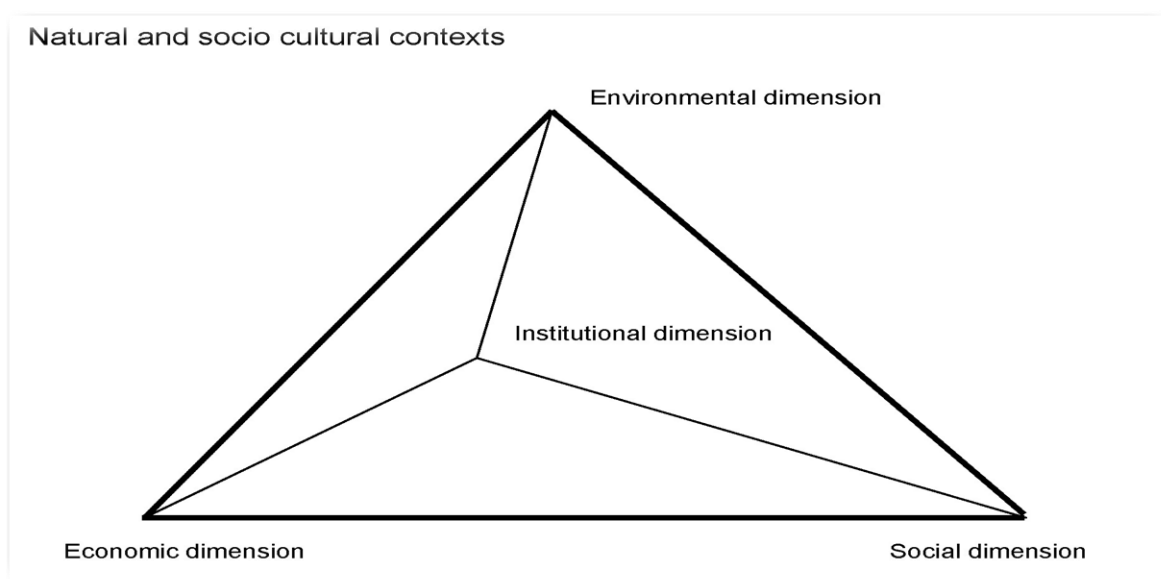
To establish a suitable mechanism for Sustainable University Governance, the prism of sustainability is adopted to represent the linkages across its varied dimensions. The economic,



social, and environmental aspects define the three vertices of the prism. The fourth vertex is an institutional dimension. For this research, the fourth vertex will be representing the state institutional structures and its governance mechanism. This institutional vertex differs from the three dimensions with only a few aspects.

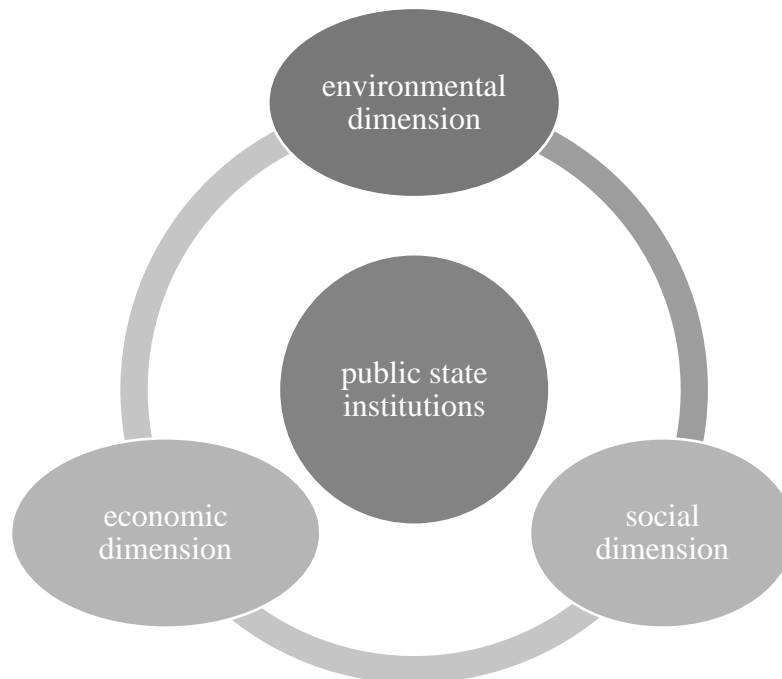
The university, at this stage, is viewed as a social subsystem to which one can identify specific objectives and assess performance. The institutional vertex shows the structures and practices that frame activities within the prism. This analytical move is designed to highlight the significance of institutions and reform for shaping outcomes. The prism draws attention not just to conditions within the three sectors of the economy, society, and environment, but to the objectives that societies define in relation to each other.

After all, sustainable development requires the integration of different dimensional principles. However, cross-dimensional inter-linkages must be taken into account, as it is here that synergies and consensus can be sought out. Juxtaposition of the fourth ‘institutional’ element points to the potential of institutional reform, not just in relation to the three basic domains, but also in relation to the interfaces among them. For example, just as the issue of resource efficiency bridges the gap between environment and economy, so the institutional mechanism is used to structure patterns of knowledge and skills in a particular context, appreciating economic, social, and environmental sustainability.



**Figure 5: The prism of sustainability. Source: Adapted from Spangenberg (2002)**

The figure below represents a sustainability sphere inspired by the prism; it shows the linkage between the varied dimensions of sustainability. That is, the economic, environmental, and social aspects of sustainable development, known as “the sphere of sustainability.” The fourth sphere is an institutional dimension representing the state institutions with its structure for the transformation of social behavior. The institutional sphere represents the structure and practices that formulate laws, policies, and frame activities for the other three dimensions to be implemented. Its inclusion as a separate pole within the sphere is an analytical move designed to highlight the significance of outcomes with regard to the economy, society, and the environment, as well as the perspective to facilitate the activities taking place within the institution.



**Figure 6: Linkage between state institutions and the dimensions of sustainable development**

### 1.3.3. Dimensions of Sustainable University Governance

Bormann, I. & al. (2018), carried out an extensive literature review and suggested five governance regulatory factors, which they argue to be the five areas of sustainability governance. According to the authors, the five dimensions of the governance equalizer have a decisive influence on the chances of success of sustainability within the university. The five



factors of the governance equalizer include: politics, profession, organization, knowledge, and visibility. Bormann et al. (2018) stipulate that if these factors are analyzed, they can play a decisive role in how sustainability governance is understood and how the processes can be successfully implemented.

The authors further state that the five factors of governance that affect everyday university life are interwoven. For example, the commitment of the university to sustainability is expressed in their relevant activities, accounting for their visibility. The authors further highlight that the factors are very important to strengthen the overall governance process. However, this alone does not lead to binding decisions (politics) or to the establishment of a concrete framework within the institution as a whole (organization). Other dimensions being observed are:

#### **1.3.4. University sustainability politics**

According to Philippe Lange et al., unpacking the triad of politics, polity, and policy might help build a framework elucidating the differences between governance modes. The author shows that the political dimension covers the process side of governance and refers to the actors and interaction processes inherent in a mode of governance. The polity dimension denotes the relationship between the interactive processes used by actors, with interaction processes inherent in a mode of governance. The polity dimension denotes the structural side of governance, understood as the institutional “rules of the game” that shape the interactions of actors. The policy dimension encompasses the content of governance; it refers to policy formulation and implementation.

This means that for the university to develop students’ competencies, they must have an internal policy that aligns with the guidelines, goals, and objectives of sustainable development for the desired university. Sustainable development goes beyond sectorial policies for political steering toward outcomes that are aligned with sustainable development. Philippe makes this clear by showing that the politics-polity interlinkage defines the political playing field. The institutional architecture, for instance, determines the actors and the various levels at which they are involved in governance processes, as well as the division of power and resources. The interlinkage is two-sided: on the one hand, politics is embedded in the polity,



and changes within the political arena can provoke alterations in the rules. Secondly, the polity-policy interlinkage determines the institutional setting for policy formulation and implementation. Polity represents the rules and procedures through which policymaking is performed. Again, there is a two-sided relationship since variation in the policy process can lead to changes in the institutional setting and vice versa.

Finally, the polity-policy interlinkage denotes, for example, the potential of state and non-state actors in a governance arrangement to actively participate in policymaking. Due to the interconnected nature, changes in one of the three dimensions almost certainly result in alterations within the other two. Accounting for the different interactive dynamics helps one to understand that sustainability governance is more than a unilateral process. This is similar to what Karl Hillman et al. (2011) proposed, i.e., the authors characterized governance by examining the three questions of who governs, how they use their politics for management of the activities within an institution.

Therefore, university sustainability politics involves the management of sustainability activities of state universities in such a way as to achieve sustainable development. According to Philippe Lange et al. (2013), the political dimension of governance refers to actors and interaction processes inherent in a mode of governance. This mode of governance questions what to govern, who to govern, how they govern, and with whom they govern. Thus, there is a need for good sustainable development policy, action plans, and programs. According to Philippe Lange et al., the institutional architecture, for instance, determines the actors and their levels of involvement in governance processes, as well as the division of power and resources to accomplish a certain defined objective. According to Niedlich (2020), Bauer et al. (2018), politics for sustainability governance ensures that sustainability programs are legitimized and implemented by the different faculties in the university without conflict. Bauer further states that the collective commitment of managers within the university to the principles of sustainability defines their functions and responsibilities, thus defining the politics of the institution.

However, training competence for sustainable development demands managers to be competent in sustainability. This thereby ensures that the objectives of sustainability are broken down into concrete activities, bindingly defined, and reviewed to foster sustainable development in state universities. Through such mechanisms, the university makes a public



declaration and commitment to education by making the university stakeholders engage through a perfect agreement. Furthermore, when managers ensure that sustainability activities become part of the culture, it enables the heads of departments to procure guidelines and ensures that the criteria for sustainability in research are defined with staff units and steering committees. However, this strategy elicits an action from the managers to create public awareness and visibility by projecting a big picture of the program that confronts individual interests with precision. Furthermore, when managers ensure that sustainability activities become part of the culture, it enables the heads of departments to procure guidelines and ensures that the criteria for sustainability in research are defined with staff units and steering committees.

However, this strategy elicits an action from the managers to create public awareness and visibility by projecting a big picture of the program that confronts individual interests with precision and direction that shapes and contrasts with vague ideas and shifting opinions. In this sense, conflicting interests are minimized, and the overall goals and objectives align with the objectives of training for sustainable development. The practice of such politics in sustainability governance facilitates accountability, reporting, control of sustainability reporting, and control of sustainability-related activities.

According to Tilbury (2011), sustainability is a multi-faceted agenda for organizations such as state universities, but when harnessed effectively, its integrative and employability potential is important. However, to achieve the level of engagement in state universities necessitates a sustainability officer as a leader. Leading sustainability in the university requires more than knowledge and commitment to the principles of sustainability. Its integrative and employability potential is important. Leading sustainability in the university requires more than knowledge of and commitment to the principles of sustainability. That is, there is a need for a good sustainability action plan to effect changes dealing with complexity, uncertainty, and multiple stakeholders. Though it is systemic, a good sustainable development program enables internal stakeholders to transform knowledge into competence, which further enhances university sustainability politics and contributes to a more sustainable future.

According to Filho et al. (2021), good governance provides adequate policy frameworks characterized by reliability and accountability, coupled with resources to support



the implementation of sustainable development. Also, good university governance depends on the model of governance used, which may differ from university to university due to the size, complexity of structures, and the purpose of the model. This calls for the expertise of a good manager, a “sustainability officer.” In using the term sustainability officer, it is essential to acknowledge the galvanizing effect that they have. Sustainability officers have the responsibility to create a vision to foster a particular practice and culture within the university. Acting as leaders, sustainability officers do not have to do it all, but must articulate an inspiring vision that compels others to buy in. As such, strong political will is needed for training to be successful.

In using the term sustainability officer, it is essential to acknowledge the galvanizing effect that they have. Sustainability officers have the responsibility to create a vision to foster a particular practice and culture within the university. That is, success in training skills for sustainable development depends on good management of the structure by the senior executive. Senior managers in positions as sustainability officers must demonstrate commitment in achieving governance objectives. An efficient sustainability officer must support and be supported by strong university ethics, values, and culture (Chandan, 2005).

Clear and ongoing sustainability reporting about the university’s governance needs to be coupled with strategies that encourage cultural change where needed. University managers have to communicate the state of development of the nation and the type of activities, which are essential to be considered in sustainable programs for training. It is also important that everyone in the university understands the system of governance, which is responsible for university sustainability politics.

Schumacher (2006) encourages hiring and screening employees. For example, if the university is committed to good governance, it will establish policies that lay emphasis on the type of recruitment, enabling transparency, accountability, ethics, and professionalism in the process of employment. Schumacher suggested that staff should clearly understand their responsibilities in order to maintain effective governance. By doing so, it will ensure fairness and appropriate record-keeping. Performance reports indicate that ethical and value-based culture and spells out areas of participation in specific kinds of decisions, more so clarifies ambiguous or overlapping areas of stakeholders’ authority. University sustainability politics requires all staff to think carefully about the policy, plan of action, and the programs available



to make proper decisions for its implementation. Actions for sustainable development in the university are more pronounced in the university when sustainability officers get involved. This is because sustainability officers have a mastery of the sustainable development concept to facilitate its implementation.

### **1.3.5. University sustainability culture**

Sustainability culture refers to the integration of sustainability values and norms into university practices. It encompasses how the university manages environmental issues, teaching programs, and reflects students' knowledge on environmental integrity. If the university promotes peace, justice, and fairness in its day-to-day practices, students will develop similar attributes. The way the university addresses gender inequality in knowledge-building will influence students' actions in resolving community and societal problems. Therefore, it can be argued that the competencies the university trains directly relate to the values and culture within the institution. When the university embraces environmental protection, it is assumed that the culture will positively impact the values that students cultivate. Adams (2018) asserts that when the university adopts an environmental sustainability culture, it becomes visible in the way students approach environmental issues. Thus, it is assumed that this culture directly influences students' attitudes and behaviors. Furthermore, the recognition of the university's impact on the community and the environment defines the university's sustainability culture (Adams et al., 2018).

For instance, the use of renewable energy sources at the University of Yaounde I, where the transportation system relies on solar energy, demonstrates the university's commitment to sustainability. This energy is harnessed using solar panels and stored on campus. If the knowledge of such systems were expanded and utilized more extensively, it could become a professional training tool within the university. Students from various faculties could benefit from practical learning experiences related to this project. The habitual application of this knowledge would become a custom and norm within the university's culture. Other practices that could be incorporated into the university culture include waste recycling on campus and the organization of activities such as workshops and academic exchange programs that promote sustainability. Such sustainability initiatives would enable students to participate in events across universities, localities, and regions, fostering a strong sustainability culture.



Another example is the practice of proper waste disposal to reduce pollution within the university and its surrounding industries. The provision of sustainably sourced pipe-borne water within the university promotes a healthy culture as a learning environment. This culture greatly enhances students' perspectives and responses to sustainability issues, particularly in regions facing water shortages. Additionally, green initiatives and sustainability practices, as outlined by Yafi et al. (2021), define the university's sustainability culture. If these practices are persistent and effective across the university's faculties, students will replicate this culture in the industrial sector when given the opportunity. However, this can only be achieved if the university develops a supportive framework, backed by institutional guidelines, to make sustainability a way of life both on campus and in society. Adopting this type of culture as a key element of university governance can significantly contribute to developing students' sustainability skills, attitudes, and behaviors."

### **1.3.6. University sustainability practices**

The practice of environmental awareness in the mode of governance among internal stakeholders such as university managers and students has greatly improved over the years, resulting in a more favorable environment. Over the years, there has been a positive relationship between the level of sustainability education and the level of practice in the universities. However, some universities in the world are experiencing difficulties in establishing a specific framework to develop competencies for social, economic, and environmental protection. Universities such as the University of Yaounde I have been trying to encourage students' participation and creation of environmental awareness in the communities. Although environmental awareness problems are critical in some countries more than in others, it is widely known in Cameroon because of the growing awareness of the effects in the different sectors of society.

Students' knowledge and practices of environmental management are important to improve their abilities and behaviors within a community. Effective environmental practice within governance models requires training and development, especially from an early age, particularly for students. Furthermore, the implementation of environmental practices depends on the framework. The governance model used in the university is expected to provide knowledge in order to create a university sustainability community. Thus, choosing the type of model to associate with the traditional models already being used in the university will increase the possibility of developing the right competencies for Sustainable Development.



### **1.3.7. *University's sustainability knowledge for sustainable development***

According to Tudomny M. (2022), to change the mindset of society about sustainability, the university needs to know about sustainability issues. Many universities support the integration of sustainability programs but, at the same time, do not have adequate knowledge of sustainability. However, it is challenging to recognize specific knowledge of sustainability, which is translated into problem-solving, systems, and critical thinking skills that favor environmental and social attitudes. It is assumed that universities that have arguably played a significant role in bringing humankind to its current position must demonstrate and educate for sustainability.

According to Dodman (2016), the relationship between knowledge and action principally defines the reason why it is developed. Throughout human history, we can identify a number of different motivations for knowledge building. The stimulus to build knowledge may stem from wonder and a desire to understand, together with a natural impulse to satisfy needs. Much indigenous knowledge demonstrates motivational types and characteristics that would seem to unite these two components in a relationship of dynamic equilibrium, designed also to place sustainability at the heart of their knowing and acting in the world. This equilibrium is based, for example, on types of knowledge that can be defined as practical, craft-based, and narrative, with characteristics such as local, contextual, and experiential, linked to learning based on observation and practice.

According to Dodman, recent human history clearly shows that knowledge building has increasingly become a prerequisite for something else. Generally, it is used for dominating, manipulating, exploiting, and exercising power to enslave, thereby rendering large parts of the human enterprise unsustainable, precisely because they become destructive of resilience and incapable of transforming the current untenable system. The types of knowledge generally associated with this tendency relate to categories such as disciplinary, paradigmatic, scientific, and technological. At the same time, it is possible to envision the development of knowledge of what we know and how we act toward sustainability. In this respect, there is a crucial link between the development of personal and social competence, depending on collaboration, which can either be disciplinary, transdisciplinary, or interdisciplinary knowledge.

University systems are based on the primacy of disciplinary knowledge, and in recent decades, increasing attention has been paid to approaches based on interdisciplinary and transdisciplinary perspectives. Disciplinary knowledge can be considered as particular sets of cultural practices typical of a given field of inquiry, experience, and activity, characterized by



specific epistemological, linguistic, and methodological features. While the belief in the importance or even supremacy of disciplinary knowledge is deeply rooted and widely held, the limits and dangers of concentrating learning curricula within disciplinary boundaries have long been recognized.

As Popper, in Dodman, puts it, we are not students of some subject matter or discipline. In the same way, for Clark, sustainability science requires a perspective that brings together theories and practices, disciplines across the natural and social sciences. It can be usefully thought of as neither basic nor applied research but as defined by the problems it addresses rather than by the disciplines it employs. It serves the need for advancing both knowledge and action by creating a dynamic bridge between the two (Clark, 2007).

In essence, Clark believes that sustainability science is a multidisciplinary field that seeks to address the challenges of sustainable development through the integration of knowledge and action. By bridging the gap between theory and practice, sustainability science can provide innovative solutions to the complex problems facing societies today. According to Camino et al. (2014), university processes present interdisciplinary and transdisciplinary approaches that are cooperative, in which disciplines and their practitioners come together to build new constructs that are very important to address common issues within the university.

Incorporating interdisciplinary and transdisciplinary approaches in education can help students develop a more holistic understanding of complex issues and prepare them for real-world problem-solving. These approaches also encourage creativity, critical thinking, and collaboration among students from different backgrounds and disciplines (Bruner, 1991). Narrative knowledge is experiential, both in the sense that it is built on experience and in that, it is still encoded as experience. It is knowledge as process, understanding a world in which things happen; people act in particular circumstances (Dodman, 2014).

By contrast, paradigmatic knowledge is experience re-coded through nominal language. The way in which motivations for knowledge building influence the types of knowledge built has led to modes of perceiving, constructing, and acting based on a dominance of disciplinary and paradigmatic knowledge whose principal characteristics have, at different times and in various ways, been seen as global, objective, complete, permanent, and product-oriented. Much education still tends to promote such a vision, at the risk of understanding without awareness. By contrast, the focus of interdisciplinary and narrative knowledge leads



to characteristics such as local, subjective, uncertain, indeterminate, incomplete, temporary, and process-oriented, and thereby modes of performing and reflecting which lead to awareness and responsibility.

Managers' knowledge on sustainability fulfills the need of sensitizing the university for action on sustainable development issues. According to Tudomny, sustainability education is all about developing sustainability consciousness, which is a complex construction of knowledge. Thus, knowledge of ESD, which emphasizes economic, social, and environmental benefits, has to be understood appropriately before engaging in training. Since state universities are striving for efficiency in knowledge building, it is advisable to place sustainability programs for effective knowledge.

In addition, two of the most essential tools for achieving sustainability are undoubtedly policy and education. A number of universities across the globe have signed accords, which give them the responsibility to adapt their curricula so that students in all faculties become conversant with issues of sustainability. The level of knowledge and support for sustainable development corresponds to the level of responsibility transferred to staff. Training is said to cover the values and code of conduct that is arguably transferred to the students.

According to Dodman (2016), the question, "What approach does the educational system use for skill development?" shows that one possible answer could be that learning curricula unify cross-curricular themes, designed to give rise to an interwoven vision for sustainability that reciprocally feeds out into each other. These are questions of vital importance for all learners, of whatever age, at the universities, whether formal, non-formal, or informal educational contexts. The theme can link learning processes both in terms of the history of humankind and in their ways of learning and being, posing problems related to why, what, and how, and participating in activities that also constantly involve asking the question "What if?" By exploring the theme, individuals can gain a deeper understanding of their own learning processes and how they have been shaped by their cultural and historical context. This can lead to greater self-awareness and a more critical approach to learning and problem-solving. Such alternatives should be seen as indispensable for true understanding of what we know (Gramsci, 1971) and the predictions involved should be considered not just as abstract hypotheses but rather as urgent prerequisites for intelligent action.



The initial focus will be on practicing personal learning as discovering the world. This process of exploration and mapping can also involve questioning the dominant narratives and power structures that shape our understanding of the world and actively seeking out understanding of what is possible and working towards creating a more just and equitable society. This changing world becomes one in which life itself changes the world. Perceiving life as a cause of change, ranging from the large-scale effects of life on the environment, from deposits to the composition of the air and climate change to the small-scale effects of life on the environment, niches, and biodiversity. At a crucial point, the relationship between knowing and acting involves a movement from representing to remodeling knowledge, which becomes related to the development of human communities and territories. From the first communities and their reciprocal interactions with their environment in different parts of the world, inhabitants, knowing and measuring utility, and producing ecological footprints.

Developing students' values defines the standard of behavior required by staff, which covers issues such as recognizing conflicts of interest, maintaining confidentiality, complying with the law and university directions, and reporting unlawful or unethical behaviors through proper channels. Good sustainability governance in universities is enacted through the behaviors and actions of staff at all levels as they contribute to the efficient, effective, and ethical delivery of their university goals. This observation is in agreement with the study done by professors at the University of Mississippi, where training of staff was found to increase knowledge. Cooperation, collaboration, and consultation among the membership of the entire university community (Center for Higher Education Policy Analysis, 2004). The study further reveals that achieving the mission of training requires knowledge, understanding of the university's managerial environment, and commitment to the formal and informal decision processes by which the university conducts and maintains its standards (Center for Higher Policy Analysis, 2004).

### **1.3.8. University's management strategy for sustainable development**

According to Niedlich (2020), moving universities towards sustainability requires sustainability orientation, breaking down sustainability-related goals within the structures in such a way that concrete actions can be taken within the university. Many universities with appropriate governance structures ensure the provision of resources as well as the management



of procedures that guarantee continuous and reliable sustainable development programs. Actions taken for sustainable development must extend beyond existing departmental boundaries, thus focusing on interdisciplinary and transversal networks as a strategy for sustainability governance to ease skill development.

Networking involves actors exchanging views and knowledge within and outside the structure while coordination ensures coherence and synergies between sustainability-related departments and non-sustainability departments. Good managers' strategies enable sustainability orientation, entrepreneurial intentions, and decentralized initiatives. For example, if individual actors like department heads take action towards sustainability, such actions at subsequent levels are channeled through entrepreneurial projects and programs created to facilitate sustainability-related activities within the universities. At this level, networking and coordination rely on specific competencies, motivation, as well as well-connected persons in the university such as sustainability officers.

### ***Strategic sustainability orientation***

According to Roxas & Bapoo (2022), sustainability orientation helps to integrate environmental and societal concerns into most institutions when shaping their strategy, operations, and tactics. Sustainability orientation has values and beliefs that are deeply rooted and can be used to provide behavioral norms to encourage universities to adopt sustainability processes so that all those involved can pull together a plan and implement targeted goals. This shows that sustainability plays a major role in the university.

However, the mere adoption of mission statements and guidelines is not enough because their development is designed in a way that students do not have the opportunity to contribute their points of view. In this way, different perspectives and ideas can be incorporated into the mission statements and guidelines. According to Galpin (2018), resilience of administrative procedures permits the adoption of strategies that enable a trans-disciplinary approach. There are many strategies for engaging with sustainable development in the university. Most of the strategies used explore the intersections between the subjects and sustainable development goals. Galpin shows that there is a connection between sustainable development goals and every content area being taught at the university, regardless of the discipline. According to the author, solving global challenges like poverty, hunger, and climate



change requires a transdisciplinary model; therefore, all the disciplines in universities must collaborate for student development.

According to Galpin (2018), institutionalization involves having a planned vision with set priority activities that must be accomplished within a period. Universities must evaluate their strategies for long-term development. This kind of global experience developed in graduates in a traditional setting enables global engagement, which helps graduates avoid poverty and injustice.

### ***Frequent and consistent communication***

According to Schumacher (2006), it is important to create and maintain an effective line of communication between sustainability officers and all employees, including a process to receive complaints or questions that are addressed in a timely and meaningful way (Chandan, 2005). Chandan states that effective communication is essential for managers to perform in their functions. Chandan further states that a plan will be meaningless unless everyone is aware of it and pulling together to achieve its objectives. The framework of communication within the university requires clear identification to enhance the relationship between stakeholders.

### ***Networking***

According to Niedlich (2020), networking within and outside the university is fundamental to developing competence for sustainable development. That is, stakeholders at the higher level need to have a consensus on the orientation of sustainability programs, goals, and fields of action to exchange information on specific problems and approaches for training purposes. Furthermore, working across university boundaries gives a clear direction on joint approaches to be used and the knowledge to implement them, thereby providing professionals with the right skills and knowledge to deliver high-quality training.

## **1.4. State universities in Cameroon**

State universities in Cameroon are higher education institutions with the aim of teaching, learning, and research. Such universities came into existence in Cameroon on July 22, 1962. The mission of the university was to train manpower for the public service of the



newly independent Cameroon (Njuema et al., 1999). By 1970, the university had seven thousand students, whereas the initially planned number of students it could host was five thousand. This trend toward overcrowding continued, and in 1977, four university centers for language translation and interpretation in Buea were created. Other centers were also established, including the University Center in Douala for business studies and the training of teachers in technical education, the University Center of Dschang for agriculture, and the University Center of Ngaoundéré for food science and food technology. The University of Yaounde, however, remained the only full-fledged university in the country.

Apart from the emerging problems of overcrowding, policymakers found it difficult to clearly define the status of languages in the bilingual system. This did not solve the problems; hence, by 1984, enrolment stood at about 17,000, and by 1990, it rose to 36,490, reaching 39,151 in 1991.

According to Njuema, admission into the university centers and specialized institutes was very competitive and based on the actual availability of openings in the public sector for recruitment. Until 1993, students were entitled to stipends and paid no tuition fees. This meant that admission to any of the university centers or specialized institutions guaranteed a well-paid government job. For this reason, the state could not allow free entry into these schools, even if the infrastructure could accommodate more students. Another limitation of the specialized institutions was that the programs offered did not correspond to the academic needs of the tens of thousands of students who graduated from secondary school every year. The facilities created to host the various university centers were severely underused. The University Center in Buea, for example, had the capacity to accommodate 2,000 students, yet only 60 were effectively studying there. The dramatic growth in student enrolment from 7,000 in 1970 to 39,151 in 1991 at the University of Yaounde was not accompanied by a corresponding increase in infrastructure. Under such conditions, the teaching and learning process became very ineffective. Staff recruitment did not match the growth in student enrolment, so the staff-student ratio was a discouraging factor for students considering enrolment. This also rendered teaching and the supervision of students' research very difficult. Laboratory equipment was grossly insufficient for the number of students enrolled in scientific disciplines. This either resulted in students shifting to other faculties or increased inefficiency in the teaching and learning process.



The author stated that this factor affected both the motivation and academic possibilities of the students and therefore resulted in low academic performance and capacity development. The overall success rate in the annual examination stood at 30%, meaning that 70% of students failed, further contributing to high dropout rates. Budgetary allocation was also a major problem. About 46.3% of expenditures were dedicated to personnel, 43.3% to student stipends, 8.9% to recurrent expenditure, and only 1.5% to research and laboratory facilities. The curricula designed in the 1960s were highly inadequate by the 1990s, failing to meet the demands of the expanding private sector and the government's increasing tendency toward downsizing the public service workforce. The number of unemployed graduates was growing due to the mismatch between the skills acquired in the university and the requirements of the labor market. The general picture of the university community in Cameroon was that of a demoralized and demotivated academic and non-academic staff. The situation was further compounded by the following problems.

The absence of a clearly defined career profile for academic staff; the prevalence of teaching overloads and poor teaching conditions; the absence of clear-cut and objective criteria for promotion based on merit the lack of research facilities and study leave opportunities. Under these circumstances, higher education in Cameroon was viewed as sick and seen as having lost all the elements of quality that it could boast of. The main policy challenge was then to re-establish quality by way of revitalization. Government reacted in decrees No. 92/74 of 19<sup>th</sup> January 1993 instituting some major reforms in the system. The main aim of the reforms was to broaden the participation of different stakeholders in the financing and management of higher education institutions through the introduction of tuition fees and eventual constriction of state funding. This ambition would presuppose considerable emphasis on quality assurance and accountability as explicit goals in governance and management.

This was translated into the following objectives;

- To provide universities with more academic and management autonomy
- To provide all Cameroonians with the opportunity to obtain university education.
- To make universities more accessible to local regional, national and international communities.



- To decongest the overcrowded university by raising university centers to the status of full-fledged universities with specific missions geared towards an overall national development perspective.
- To make rational optimal use of infrastructure, facilities and services.
- To revive and maximize inter-university and international co-operation.

Some vital presuppositions could be proposed in the context of the outlined circumstances and actions. These moves recognized the fact that higher education in Cameroon was losing its international competitiveness and harmony with the global academic community.

According to Mebara (1998), in a report at the UNESCO World Conference on Higher Education in Paris (1998), the Minister of Higher Education declared that it was the government's intention to encourage an entrepreneurial spirit in the higher education subsector (Mebara, 1998). Such a policy goal aligned with the objectives of the 1993 reforms. In March 2001, Bill No. 694/JPL/AN was presented to parliament, proposing a comprehensive policy framework for higher education in the country. This suggested that the system was steered primarily through regulatory provisions, reflecting the centralized nature of higher education governance in Cameroon. A decentralized system, on the other hand, would allow institutions to design their corporate plans more freely.

Njeuma et al. (1999) argued that, apart from the University of Buea, none of the six state universities in the country had a detailed strategic plan. This might have been due to the lack of an explicit mandatory provision for strategic planning in the decree instituting the 1993 reforms. However, in 1999, the Ministry of Higher Education developed a plan to appoint UNESCO experts to draft a general strategic plan for the ministry. This demonstrated the government's perception of the strategic role that planning played in achieving its higher education objectives. The political and economic context in which these institutions were created was challenging. The period cited above coincided with a severe economic crisis and the devaluation of the national currency. The reform that established the universities was regarded by most donor agencies (Njeuma et al., 1999) as a necessary step despite these economic constraints.

The state universities in Cameroon are divided into cycles. First cycle second and third cycle. To be part of the state university students must be holders of general certificate of



education specifically two advance level papers and four ordinary level papers including French and English, which is compulsory in the universities like Buea and Bamenda for the Anglophone students and the francophone requires baccalaureate with an average score of 10 from the general education. Then the next segment is made up level four and level five upon conclusion a student obtains a master degree (Master), followed by the third segment which is made up of three-year, doctorate one, doctorate two, doctorate three, upon conclusion student obtain Ph.D. The segments are organize and coordinated in such a way that students have the possibility to transit upon conclusion of one segment or cycle from one state university to another, or student seeking transfer to another public university in-between level may do so with ease.

#### **1.4.1. Cycles of education in state universities in Cameroon**

##### **1.4.1.1. First Cycle of the Cameroon Higher education**

In Cameroon's state universities, the undergraduate level has the highest student population density. Learners must complete one hundred and eighty credits over six semesters in this level, spanning three years, with thirty credits per semester. If they do not obtain a grade of at least 10, students are permitted to retake the course during the resit session. Each year, in order to advance to the next level, students must have a cumulative GPA of at least 2.0. At this stage, coursework is primarily theoretical, with limited emphasis on practical training, internships, and career-oriented material. This focus on generalized knowledge rather than specialization could impact students' efficiency and effectiveness in the job market. However, seven core competencies are essential in every academic or professional environment, including critical thinking, problem-solving, communication, teamwork, and collaboration.

##### **1.4.1.2. Second Cycle**

The second cycle, or Master's level, includes both specialized professional training and general academic instruction. These programs equip students with the advanced knowledge and skills necessary for research or professional careers. Holders of a first-cycle degree are eligible for admission to the second cycle, subject to available space in the relevant institutions and compliance with statutory admission requirements. According to these regulations, entry into this cycle may be determined through competitive exams or a review of applicants' academic records. The second cycle courses are structured to align with evolving qualifications



and professional demands and are evaluated at the national or regional level by authorized accreditation bodies.

#### **1.4.1.3. The third cycle**

Upon completion of the third cycle in Cameroon's state universities, students are awarded a PhD, qualifying them to pursue careers as researchers. This cycle involves advanced training programs that integrate the latest scientific and technological developments. Admission requirements for the doctoral cycle, as well as research activities, may be supervised or co-directed by professors from various universities, facilitating joint degrees in accordance with legal provisions. Curriculum development, student evaluation, and research funding are occasionally supported by professional organizations and decentralized institutional units.

Since 2007, Cameroon's higher education system has been governed by the LMD (Licence-Master-Doctorate) system. Higher education regulations, including the Poverty Reduction Strategy Paper (PRSP) 2020-2030 and Law No. 98/004 of April 14, 1998, on education policy in Cameroon, shape university governance. These regulations grant state universities autonomy, enabling them to manage educational activities, programs, lectures, and research. Legislation and hierarchical governance structures ensure academic freedom and structured decision-making. Governance is further enhanced by the involvement of multiple stakeholders, each contributing diverse skills, perspectives, and expertise. These include the university rector or chancellor, who leads the administration; deans and department heads; students; faculty members engaged in teaching and research; and administrative staff.

#### **1.5. Laws in education and Sustainability governance in state universities in Cameroon**

Sustainability governance in this study aims to integrate and implement sustainability in state universities in Cameroon to reduce unsustainable practices and promote sustainability competence within the university. Only a few state universities in Cameroon address sustainability in research, teaching, and practice. There has been insufficient agreement on how the demands of sustainable development should be utilized as a mechanism to promote competence in state universities. However, some universities in Cameroon offer orientation and provide a framework for integrating and implementing sustainability as a normative principle of governance to improve research and training. Moreover, the conceptualization of sustainability in state universities provides the basis for effectively implementing its action plan and activities, which are indispensable for training. State universities require sustainability



governance to ensure that the right policies, culture, knowledge, practices, and management strategies foster the development of students' competence for sustainable development.

States in Cameroon are governed and managed by the Ministry of Higher Education (MINESUP). The ministry is responsible for developing and implementing government policies and programs in Cameroon. It analyzes and advises the government on ways to adapt the higher education system to national, social, and economic realities, particularly regarding the relevance of higher education to the needs of the national economy.

The ministry governs higher education through laws such as Law No. 98/004 of April 14, 1998, on the orientation of education in Cameroon, Law No. 005 of April 16, 2016, to guide higher education, the Poverty Reduction Strategy Paper (PRSP) 2010-2022, Decree No. 2011/119 of May 18, 2011, and the National Development Strategy (NDS) 2020-2030.

#### **1.5.1. Law N° 98/004 of 14 April 1998 on the Orientation of Education in Cameroon**

Law No. 98/004 of April 14, 1998, was based on recommendations presented during the national conference on education. This statute established the general legal framework for education in Cameroon. The law supports educational administrators in their efforts to align the educational system with the vision, mission, and goals that shape higher education in Cameroon. It focuses on faculty development and citizen competency training to support societal well-being and economic prosperity. However, this law does not place much emphasis on fostering university sustainability expertise. Although it mentions the promotion of certain aspects of sustainable development, it lacks specific measures to integrate sustainability into university governance.

#### **1.5.2. Law no 005 of 16<sup>th</sup> April 2016; laying guidelines for higher education in Cameroon**

Article 6 of this law emphasizes the goals of higher education by stating that education must serve as a vehicle for social advancement with the input of qualified national bodies and socio-professional groups, particularly in designing programs, scheduling theoretical classes, practicals, and internships. However, the policies either do not take effect immediately or, if they do, are poorly implemented. The policies are essentially stated, but no real action is taken



to ensure their implementation. More specifically, policymakers avoid collaborating with external stakeholders when planning education policies.

### **1.5.3. National Development strategy paper (NDS) (2020-2030)**

The National Development Strategy for Vision 2030 provides guidelines for the long-term structural transformation of the national economy, human capital development, employment promotion, economic integration, and governance. Although several aspects of the strategy target unemployment, the document primarily focuses on economic transformation, with little mention of sustainability in processes and programs. Without strong capacity-building efforts, structural transformation remains limited.

This program was established to foster robust sustainable economic growth while significantly reducing poverty.

This critical document was produced through an inclusive process involving the populace, civil society, business leaders, private organizations, and government agencies. As a guide for government actions and coordination, the paper prioritizes structural transformation and poverty reduction. However, the country faces several challenges, such as landslides, climate change, water shortages, poor waste management, and economic revitalization.

Due to the shortcomings of these policies, the Growth and Employment Strategy Paper (GESp) was created to mandate higher education to address Cameroon's concerns with economic growth and sustainable development, aiming for the country's emergence by 2030. According to Section 3 of GESp (2009), significant changes have been made in education, including staff training, technology diversity, and a framework for skills acquisition. However, despite these reforms, education has not significantly reduced poverty or provided universal access to high-quality education that ensures continuous progress.

### **1.5.4. Sector- wide Approach in Cameroon Education (SWA)**

The SWA was introduced in 2005 as a national approach to education in Cameroon, aiming to implement the constitution's provisions and higher education orientation laws (SWA, 2005). However, SWA demonstrated the need for vocational and professional human



resource development and the establishment of monitoring and assessment systems at every level. Through this approach, students are trained to become responsible citizens.

### **1.5.5. The professionalization of state universities**

Despite significant efforts by universities to bridge the gap between training and the labor market, Cameroon's educational system continues to struggle with professionalizing studies. Adequate training programs are still not widely recognized as effective professional education for competence development. According to Niedlich (2020), students' competence for Education for Sustainable Development (ESD) is in high demand and requires professionalization, which can only be achieved through highly skilled staff who focus on interdisciplinary and transversal approaches. These professionals use different disciplines, research, campus resources, and outreach, characterized by diverse demands, processes, and frameworks.

Moreover, moving toward sustainability requires cross-cutting professional dialogue on what ESD should encompass, which principles and standards should apply, and how ESD can be integrated into everyday practices across university disciplines. Professionals must transfer the right knowledge and competences to address challenges related to technical and expert knowledge.

At the lowest level of engagement, sustainability involves reflections on its issues by individuals in specific faculties. At higher levels, it involves exchanging ideas across disciplines, ultimately leading to a common understanding of sustainability that informs professional actions and interdisciplinary activities. Sustainability governance fosters the professionalization of students' competence by facilitating communication and collaboration among different sectors, reducing conflicts in skill sets for training.

However, the process of designing sustainability reporting channels to aid decision-making can create complexities. For instance, the timing and accessibility of training curricula are critical for sustainability reporting to enhance stakeholders' decision-making on competence development. Lack of transparency can hinder efforts to bring together the appropriate stakeholders for decision-making, potentially impacting economic and governance



sectors. Ensuring effective information flow supports governance and management processes, establishing communication channels crucial for training structures.

Furthermore, misunderstandings regarding the knowledge required for sustainability professionalization are particularly evident at the local level, where general competence training may fail to align with regional, national, or international contexts. As a result, oversaturation of information on ESD competence training can reduce stakeholders' trust in decision-makers. Training inadequate competence further weakens trust in decision-makers, potentially leading to reputational risks that affect subsequent decisions.

According to Buear et al. (2021), stakeholders from different disciplines must develop a common understanding of sustainability. The willingness to accept and take responsibility varies, particularly when solutions and benefits extend beyond a specific asset or decision-maker's jurisdiction.

According to Shaw, R., Mallick, F., and Takeuchi, Y. (2011), universities are key to professionalizing sustainable development. They provide guidance on curriculum content delivery and ensure universities remain responsive to changing societal needs. In this regard, including external actors in university governance enables institutions to adapt flexibly to evolving requirements over time.

## **1.6. Theoretical framework of sustainable university governance**

The theoretical framework suggested here includes theories, models, and paradigms: the absorptive capacity model, the paradigms of organizational structure, system theory, social learning, social-cognitive learning theory, and social-constructionist theory. Students' competency in education for sustainable development cannot be enhanced without incorporating sustainable development programs into state universities' curricula. Its exclusion depends on the structure and framework used in the university to connect managerial competencies with organizational capabilities, linking individual and organizational learning.

In social science, Ovortrup (2018) views exclusion as a multi-dimensional phenomenon in which different variables related to sustainable development are omitted from university



programs, particularly exclusion from participation in social and environmental learning. Such an approach examines the relationship between the problem of exclusion and its underlying reasons. It helps analyze the effects of university sustainability factors that influence its integration. Only by doing so is it possible to explore the mechanisms at work and the criteria that determine its inclusion in a specific context.

### 1.6.1. The absorptive capacity model

Zahra and George proposed the absorptive capacity model in 2002. The model originated in the field of strategic management and was developed as a framework to understand how firms can effectively acquire, assimilate, and exploit external knowledge to enhance their innovation and competitive advantage. The model builds on the concept of absorptive capacity, which refers to an organization's ability to recognize the value of external knowledge, absorb it into its existing knowledge base, and apply it to commercial activities. Zahra and George expanded this concept by introducing four specific dimensions of absorptive capacity:

**Acquisition:** This dimension focuses on a firm's ability to identify and acquire external knowledge from various sources, such as customers, suppliers, competitors, and research institutions.

**Assimilation:** Once the knowledge is acquired, the firm must integrate it with its existing knowledge base. This dimension examines the firm's ability to understand, interpret, and effectively combine external knowledge with internal knowledge.

**Transformation:** This involves modifying or adapting acquired external knowledge to fit the firm's existing routines, processes, and technologies. It highlights the importance of aligning acquired knowledge with the firm's capabilities and objectives.

**Exploitation:** The final dimension focuses on the firm's ability to effectively apply assimilated and transformed knowledge in commercial activities, such as developing new products, improving processes, or entering new markets.

The absorptive capacity model has found wide applications in various domains, including organizational learning, innovation processes, technology transfer, internationalization strategies, strategic alliances, and knowledge spillovers. Researchers and



practitioners have used this model to gain insights into how firms can effectively leverage external knowledge to improve their competitiveness and performance.

Overall, the absorptive capacity model proposed by Zahra and George (2002) provides a valuable framework for understanding how firms acquire, assimilate, and exploit external knowledge. It has advanced the field of strategic management and has been widely utilized in research and practice to explore the role of knowledge absorption in enhancing firm performance and innovation capabilities.

### **Application of the absorptive capacity model applied in sustainable university governance to enhance students' competency in education for sustainable development.**

**Acquisition:** Universities can focus on acquiring external knowledge related to sustainable development from various sources, such as UNICEF and UNESCO. This can involve building partnerships with sustainability-focused organizations, collaborating with industries, and seeking expertise from government agencies. By acquiring knowledge and resources from external sources, universities can expand their understanding of sustainable practices and incorporate them into their curricula.

**Assimilation:** Once the knowledge is acquired, universities must integrate it into existing educational programs and practices. This is achieved by incorporating sustainability-related courses, modules, and projects into different disciplines. It also involves training faculty members to understand and incorporate sustainability concepts into their teaching methodologies, ensuring that sustainability knowledge becomes an integral part of students' education.

**Transformation:** Transforming external knowledge into actionable learning experiences is crucial for developing students' competency in education for sustainable development. This can involve creating opportunities for students to practically apply sustainability principles through internships, research projects, and community engagement. By transforming acquired knowledge into hands-on experiences, students develop a deep understanding of sustainable practices and their implications.



**Exploitation:** The final dimension involves applying assimilated and transformed knowledge. In Sustainable University Governance, this entails providing avenues for students to actively engage in sustainable initiatives on campus and beyond. This includes involvement in sustainability committees, participation in sustainable campus projects, and promoting sustainability practices among peers. By actively applying the knowledge gained, students become catalysts for sustainable change within the university and the broader community.

To apply the absorptive capacity model effectively, universities can establish dedicated sustainability offices or committees responsible for overseeing the integration of education for sustainable development. These entities can work closely with faculty, students, and external partners to ensure the successful implementation of sustainability initiatives. Furthermore, ongoing evaluation and feedback mechanisms can be implemented to continuously assess the model's effectiveness and make necessary adjustments.

By applying the absorptive capacity model in Sustainable University Governance, students' competency in education for sustainable development can be enhanced. Universities have a unique opportunity to equip students with the knowledge, skills, and mindset needed to address environmental, social, and economic challenges in the future.

Competence in an organization is seen as an existing repertoire of possible actions available to managers and members. It is the combination of skills, knowledge, and attitudes of individuals, whereas capabilities, on the other hand, refer to the existing repertoire of possible actions of individuals, which are also described as routinized processes embedded in an organization (Winter, 2003). Todorova suggested that absorptive capacity consists of five distinct dimensions: recognition, acquisition, assimilation, transformation, and exploitation of external knowledge. The first dimension, recognition, involves identifying the value of external knowledge, which is obtained by searching for knowledge with the potential to add value to the firm (Todorova & Durisin, 2007).

At this level, individuals recognize the value of external knowledge through their intuitive and cognitive processes (Sun & Anderson, 2008). The second dimension, knowledge acquisition, refers to the effort made in gathering knowledge, including socio-psychological processes of intuition and cognition. This stage involves ingesting and processing information.



The knowledge obtained externally must be understood by managers to properly transmit it to members of the organization. Knowledge assimilation and transformation involve analyzing, integrating, understanding, and contextualizing knowledge to meet organizational needs.

Applying this theory to the present study suggests that students' competence should be developed in universities using sustainable development principles. The mechanism or framework must conduct an appropriate search to acquire the right knowledge, assimilate it, and then transform it to correspond to the university context, meeting the needs of present and future students in terms of skills and competencies.

### **1.6.2. Paradigms of Organizational Structure**

Organizations differ from one another in the way they are designed for decision-making, knowledge transfer, and learning. In such organizations, learning depends on how the governing bodies govern and manage the organization. According to Baligh (2006), each organization is made up of a set of people who govern, based on a specific set of logical relationships that exist between one person and another. The set creates a pattern known as a structure with a defined culture and practice. Decisions made by one person are based on the use of rules created either partially or entirely by another person. The ordered set of people in the organization is often described in a hierarchical chart in such a way that the positions of people from top to bottom are connected by a line representing the relationships and the level of decision-making in the organization. It is the concept of organizational structure that makes it possible to discuss governance or management in the university. It is this fundamental concept that explains the traditional organizational chart of boxes connected by lines, which represents governance structure, in this case, university governance structure (Baligh, 2006).

According to Gayle et al. (2003), who cite Birnbaum (1989), the structure of academic organizations can be categorized into five systems: tightly and loosely coupled collegial, bureaucratic, political, anarchical, and cybernetic systems. In the collegial system, organizational functioning and decision-making are visible within bureaucratic systems, while the political system emphasizes group representation in the governance process. The anarchical system rests on the assumption that academic organizations have vague goals, and therefore their processes are obscure. The cybernetic system relies on self-correcting mechanisms that can monitor organizational functions and give warnings when things are not going well. Proponents of structural theories, such as Birnbaum (1989) and Gayle et al. (2003), suggest



that to understand governance, it is important to examine organizational structures, such as the lines of authority, roles, procedures, and decision-making bodies. Kezar and Eckel (2004) further elaborate that the structure can be managed or changed more directly to influence social interactions. However, the process of governing, especially in decision-making, conflicts, and social actions, is regarded as politically motivated due to the existence of diverse groups. This observation therefore incorporates political perspectives into organizational functioning within the bureaucratic structure. Trackman (2008) argues that politics within organizational structures are based on three theories rooted in interest group theory.

According to Parrilla et al. (2016), there are two dominant groups, the pluralist and the elitist. The pluralist approach competes to shape public policy, making it a product of the dynamic interplay among organized interests. The interests may not have the same resources and goals, but there is ultimately a pluralist representation of views. On the other hand, the elite approach stresses that the organization is neither neutral nor composed of disinterested actors devoted to the progress of knowledge or competing equally in shaping public policies. For any governance process to be effective, a structure must be designed and policies must be implemented to improve effectiveness and achieve ideal functioning. At this point, it may be observed that universities, like any other organization, have a bureaucratic system in place that provides rules and regulations. The structure focuses on people, because they are central to the political framework. Individuals are the key variables because they influence informal processes and play a critical role in policy formulation cycles. These political forces determine how the organization is governed. Many governance studies have adopted structural theories with the main argument that structure determines the organization.

Gayle et al. (2003) sought to examine how structural and cultural elements of universities influence university governance. The authors asserted that the nature of governance has a significant impact on teaching and learning due to significant controversy in the distribution of authority among various universities. It is important for universities to restructure their governance structures or mechanisms to ensure that they do not hinder the progress and achievement of the overall mission. The university has a pluralistic characteristic and is fractured into interest groups or power blocs. Politically, many policy-related interests exist within universities, such as policies concerning affirmative action, student codes of conduct, academic freedom, staff appointment, promotion, and resource allocation (Asmiran,



2009). Therefore, universities can be seen as political entities because individuals articulate their interests and seek power. Power is derived not only from legitimate authority but also from influence, which at times may exceed authority.

As observed by Gayle and Asmiran, the political paradigm underpins the influence of conflicting parties in universities as organizations. This explains why universities engage with different interest groups to balance political interests. Henri Fayol and Max Weber recognized the creation of structures and departments to ensure proper functioning of organizations such as universities. Taylor and Fayol emphasized the existence of rules and regulations to facilitate relationships among these structures in order to accomplish certain objectives. Weber (1952) sought rules to eliminate managerial inconsistencies that contributed to poor performance. The author believed that every deviation from the formal structure interfered with efficient management.

Weber further demonstrated that strict adherence to rules makes bureaucracy efficient in an organization. However, Chandan (2005) argued that bureaucracy, being associated with excessive rules and regulations, makes it difficult to implement changes or approve proposals. It is argued that in a competitive global market, organizations are moving towards participative management, teamwork, employee innovation, and creativity, whereas bureaucracy offers no room for such developments. Gayle et al. (2003) observed that with increased state intervention in university affairs, it makes sense to examine universities as part of the state system. Moreover, universities obtain their inputs from the environment and contribute their outputs back to the environment. Theoretical orientations have prioritized some components in the structural configuration of university governance more than others. For instance, bureaucratic approaches emphasize administrative staff, political approaches focus on competing interest groups, and open system approaches examine the relationship between internal and external components.

### **1.6.3. The system theory by Niklas Luhmann /Ludwig von Bertalanffy (1969).**

According to Luhmann, each society is divided into various autopoietic systems and separated by subsystems, such as the political system and economic system. The social system is made up of structures that are maintained in a complex environment. It gives a meaningful



context and is thus able to orient actions. The systems theory of Luhmann is based on several essential elements, but only those necessary for this study are introduced below.

### *Communication*

The core element is communication as the unity of information. Each social system consists of countless meaningful communications. Moreover, society exists only where communication is possible. Luhmann states that communication is therefore both society and the essence of society. Communication can be considered the basic unit of observation for the assessment of the operations of social systems. According to Luhmann, communication is an ongoing process that continues without interruption to sustain operation and reproduces itself. Social systems are not stable; that is, they are not stagnant structures. The systems consist of a multiplicity of events that change easily. Thus, social systems communicate about the environment but cannot communicate directly with it.

### *Autopoiesis*

According to Luhmann, society and all its sub-systems are autopoietic systems that recursively self-produce communication. Autopoiesis means self-creation or self-making. Luhmann refers to autopoiesis as a circular self-production. It is based on a so-called differentiated approach, which is operatively closed. Each autopoietic system is only able to refer to its own unique and unchangeable communication. It reproduces itself in accordance with its own codes and programs through system-specific communication. Autopoietic systems are therefore more than just autonomous, self-contained entities. They rely on constant and concrete structures, which are not resistant to evolution and change. Evolution, learning, and changes are possible and necessary but only within the boundaries of the system. The various systems are connected via structural couplings.

### *Differentiation*

This theory relies on the clear and strict differentiation of autopoietic systems and their environment. Each autopoietic system considers the other systems as part of its external environment. This distinction between a system and its environment is only possible if the system is self-contained and draws boundaries with its own system-specific operations. Such



differentiation from other autopoietic systems is only possible when the systems are self-determined. This differentiation is essential for the unity of the system. In other words, unity in self-referential autopoietic systems is possible only when the systems are autonomous. This separation from the environment—that is, from everything outside the system—is only possible if there is a clear distinction between the system and its environment.

### ***Operatively Closure***

The distinction between a system and its environment is only possible when the system is self-contained, capable of defining its own system-specific operations, and able to monitor these limits externally as a difference from the environment. Due to the specificity of its operations, a system cannot communicate with its environment in a direct manner. Its system-specific communication logic is exclusively compatible within the system and does not work outside of it. Thus, a direct exchange of information between the system and its environment is not possible.

### ***Functional Differentiation***

In modern societies, systems function autonomously and begin to specialize. According to Luhmann, functional differentiation leads to specialization among various systems. For example, the political system can only explore problems in terms of their political implications, and this is effectively done when communication and activities are considered in terms of their function and their contribution to the complex structural unity of the system. Moreover, none of these systems can take over the functions of another.

### ***Structural Couplings***

To describe inter-system relationships, structural coupling serves as a key instrument. Unlike temporary operational couplings, structural coupling is permanent and exists only when a system permanently presupposes certain characteristics of its environment and relies structurally on them. Structural coupling does not prevent autopoiesis in a particular system; thus, there is no causal transmission, and the process is highly selective, engaging only with certain parts of the environment while excluding others. Structural coupling has a double effect: it includes and excludes at the same time. Everything that is included in the coupled system



can be used, whereas everything excluded cannot be utilized. Through these couplings, a system can react to external stimuli and adjust its structures accordingly. These couplings lead to mutual influences. As a result, the systems remain independent, but they establish connection points, and their structural development is coordinated. In structural coupling, structures appear in various forms. For instance, consider the coupling between the political system and the legal system. The key point is that the relationship between two distinct yet interconnected systems can be recognized as a driver of increasing mutual interdependence.

### *The Political System*

The political system is responsible for making binding collective decisions for society as a whole. According to Luhmann, this involves not only legal but also legitimate authority to ensure that all decisions are enforced. The confidence vested in the political system depends on its decision-makers. This system illustrates that every legal decision is deemed legitimate and thus accepted, even by those who initially opposed it during the decision-making process. The ability to make binding decisions depends on the differentiation and autonomy of the political system. This occurs only when expectations are effectively adjusted.

#### **1.6.4. Application of the theory to the study.**

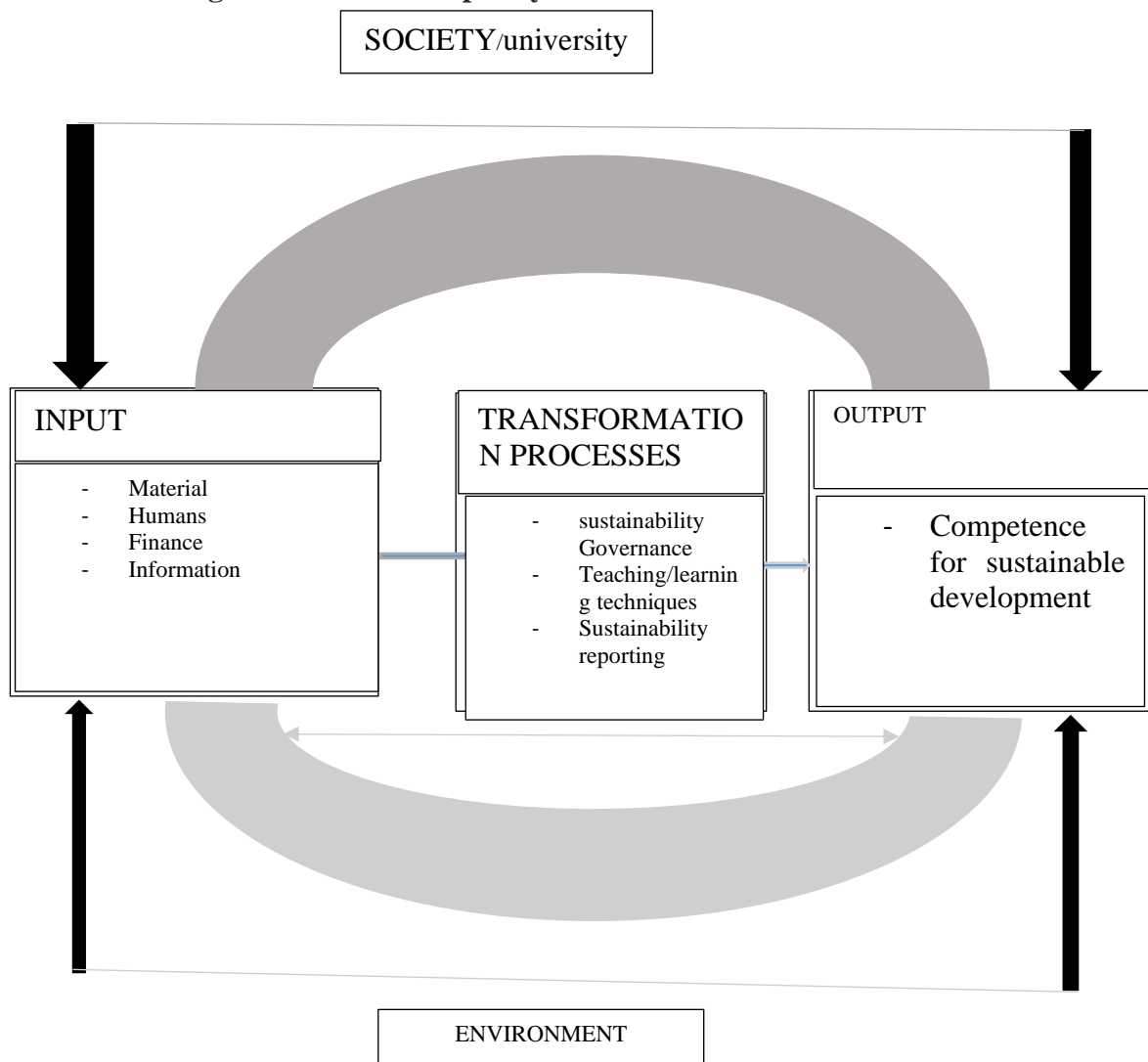
The university is a system with subsystems that are interrelated and governed by a governance mechanism. The university communicates internally through reports and externally by producing skills that benefit society and contribute to its health and progress. According to Ludwig, the whole is greater than its parts, but the relationship between those parts and their environment is just as important, as they are interwoven in such a way that any change in one part affects the entire system. This aligns with Aristotle's dictum that "the whole is greater than the sum of its parts." Considering the university as an open system is crucial because it implies that no single element within the university system is more important than another in achieving its objectives. Each component contributes equally to the system's overall mission.

According to Tanah (2015), a system is a unit composed of interrelated and interdependent parts, where a change in one part influences the others. The fundamental idea embedded in system theory is that all components are interconnected, and their interactions



affect the system as a whole. In this context, system theory affirms that an educational system, as an open system, consists of multiple components that must work together to achieve a common vision. This perspective aligns with the view that understanding one part of a system helps in understanding another (Kuhn, 1974). The goal of applying system theory is to systematically analyze system dynamics, constraints, and conditions, as well as to identify principles, methods, and tools that can enhance the university system and improve students' skills.

**Figure demonstrating education as an open system.**



**Source literature Figure 7: An institution functioning as a system**

The figure above presents system theory in an institution with its inputs, processes, and outputs. It relates all parts to one another and provides an avenue for feedback, which helps the institution correct errors and make better decisions. The input is received from the



environment, the output goes back to the environment, and the feedback is also obtained from the environment.

System theory is sometimes used in research to determine the inclusiveness or exclusiveness of an event or program within a system or sub-system. As illustrated previously, Luhmann's theory is a theory about a system of systems in which several inclusive and exclusive mechanisms act. Our application lays emphasis on the inclusion of sustainable development programs to enhance competency in education for sustainable development in university subsystems (Hilt, 2017). The notion of including ESD is strongly connected to the functional differentiation of the university's structures. The inclusion of any program at the university depends on the politics of the university, especially the faculties, which are microsystems within the university.

According to Luhmann, communication is essential for unity within the system since its governance structure defines the operations that are included in the system. These sub-systems consist of meaningful contexts regarding social actions that refer to each other and delineate the outside world. The different sub-systems respond to a complex environment (the institutional environment) and are built on reports to meet the needs of stakeholders, such as the need for sustainable development. Applying the concept of inclusion as stipulated by Luhmann to the university demonstrates that it is possible for sustainable development programs to be more or less included in different faculties of the university. The faculties are segregated into different departments, which are segmented into disciplines that define their programs, competencies, and skills for society. In such universities, the order of inclusion follows the departmental differentiation principle.

This demonstrates that the inclusion of sustainable development must be understood in relation to functional sub-systems. These sub-systems are based on a governance model and principles that include aspects of science but exclude aspects of the environment, society, economy, and hygiene in the university (Luhmann, 1995). Governance inevitably arises when operations are interlinked and thus provides the framework for specific operations that are suitable for inclusion in the system (Luhmann, 1995). At the university, inclusion or exclusion takes place at the departmental level within the faculties. Meaningful content acts as the internal node around which communication in the system is centered. Therefore, classroom



activities can create many different social sub-systems. Information and messages channeled through technology create a certain degree of awareness regarding students' skills. Since a system produces the same communication and is built around a concept, it can be considered autopoietic. Different sub-systems can respond to the complex needs of the environment.

When a student in an educational sub-system cannot be trained regularly to be competent, they need additional support that the broader educational system may not be able to provide. Once this is determined, several possibilities for systemic differentiation arise. For instance, an inclusive system may differentiate and develop mechanisms like adaptive teaching or professionalization in the classroom. However, systemic differentiation in a policy-compliant system can be exclusive in many ways. For example, it can be socially or academically exclusive. This implies that things could have been done differently in other cultures and contexts. When the managers within a system choose the type of program and competency to include, they also decide which ones to exclude.

Some principles in the university are designed to include environmental hygiene, societal health, neutrality, and humanitarian action. These principles are normative since they are based on social justice policies and measure inclusion based on the same normative principles that society has created for itself.

According to Luhmann, these principles imply that people have equality in rights and freedom to choose the type of programs within a specific functional system. However, people use their rights and freedom differently, and the functional system determines the criteria for inclusion or exclusion of various programs. Still, this idea presupposes equality before the law and freedom in the principles of inclusion so that a given system can be legitimized by enacting policies for the management system to achieve them. Exclusion is thus seen as temporary and subject to change (Luhmann and Rasch, 2002). The legitimization of different programs within the subsystems, such as at the departmental levels, is created through policies. The empirical correlation between overlaps and other societal systems is clear: education fosters sustainability competencies, whereas a lack of education increases the risk of exclusion and marginalization. From this perspective, inclusive and exclusive mechanisms of sustainable development are, and will always be, a reality that must be dealt with in university policies and

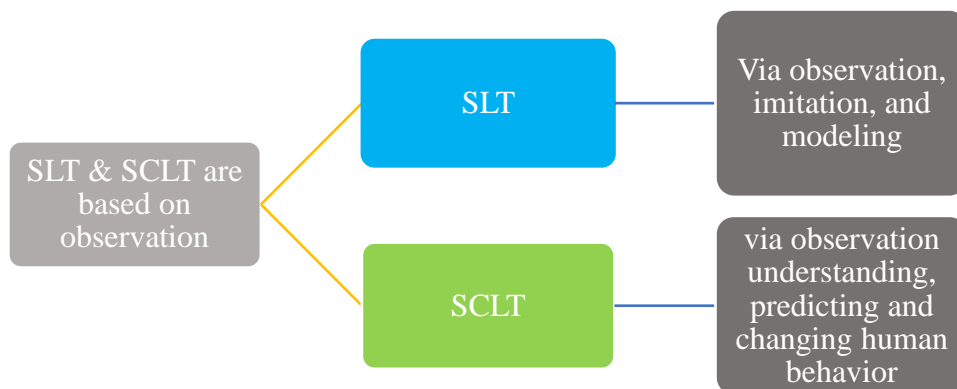


programs. It is unrealistic and conceptually impossible to think that everyone can be included in such a program.

Instead, we are dealing with a complex, sophisticated, and flexible system composed of exclusive programs. As illustrated, the inclusive processes leading to sustainable development programs within the university resemble the inclusive and exclusive processes in society to a great extent. This means that focusing on the complexities of inclusion is not only relevant as a prerequisite for managing or governing, but it is also a way of preparing students to participate in societal development (Qvortrup, 2018).

### 1.6.5. Bandura's Social Learning Theory & Social Cognitive Learning Theory

Albert Bandura is known as the father of social cognitive theory. He was born on December 4, 1925, in a small town in northern Alberta, Canada, located approximately 50 miles (80 km) from Edmonton. Bandura's early education took place in a small school with only two teachers. Scholars categorize learning theories into behaviorism, social learning theory (SLT), and social cognitive learning theory (SCLT). In the context of this study, Albert Bandura is arguably the most eminent living psychologist. His social cognitive theory has influenced many areas of education.



**Source: Bandura theory Figure 8: Process of SLT and SCLT based on observation**

#### ***Social learning theory (SLT)***

Social learning theory is increasingly cited as an essential component of sustainable natural resource management and the promotion of desirable behavioral change (Muro & Jeffery, 2008). This theory is based on the idea that we learn from our interaction with others



in a social context by observing their behaviors, assimilating, and imitating them. This is especially true if the observational experiences are positive ones or include rewards related to the observed behavior. According to Bandura, imitation involves the actual reproduction of observed motor activities. SLT has become perhaps the most influential theory of learning and development.

This theory is seen as the bridge between behaviorist learning theory and cognitive learning theory because it encompasses attention, memory, and motivation (Muro & Jeffery, 2008). However, in this regard, Bandura believes that the direct reinforcement theory could not account for all types of learning. For this reason, he added a social element, arguing that people can learn new information and behaviors by watching other people.

According to the elements of this theory, cognitive learning theories emphasize attention, memory, and motivation (Muro & Jeffery, 2008). However, in this regard, Bandura believes that direct reinforcement alone could not account for all types of learning. Therefore, in his theory, he added a social element, arguing that people can learn new information and behaviors by watching others.

According to the theory, there are three general principles for learning from each other.

### ***General Principles of SLT***

The principles of social learning are assumed to operate in the same way throughout life. Observational learning may take place at any age. Since exposure to new, influential, and powerful models who control resources may occur at various life stages, new learning through the modeling process is always possible (Newman & P. R., 2007).

SLT posits that people learn from one another via:

- Observation
- Imitation
- Modeling

Based on these general principles, learning cannot occur without a change in behavior. In other words, behaviorists say that learning has to be represented by a permanent change in



behavior, whereas social learning theorists argue that because people can learn through observation alone, their learning may not necessarily be shown in their performance (Bandura, 1965). Learning may or may not result in behavioral change.

### ***Behavior learned through modeling***

The people who are being observed are called models, and the process of learning is called modeling. Here, Bandura's second and third stages of social learning, which include imitation and behavioral modeling, will occur if a person observes a positively desired outcome in the first stage.

For example, if an instructor attends and observes a course "in-world" and is entertained, informed, and approves of the way students act, he or she is more likely to want to teach a course "in-world" themselves. They can then use the behavior they experienced to imitate and model other instructors' teaching styles "in-world" (Bandura, 1986).

Previous studies confirm that at least part of many behaviors can be learned through modeling. Some examples that can be cited in this regard include: students can watch how recycling is done, students can watch demonstrations of water conservation techniques, or see someone acting bravely to create awareness of the effects of climate change. From this view, moral thinking and moral behavior are influenced by observation and modeling.

In addition, learning includes moral judgment regarding what is right or wrong and is developed through modeling.

Based on the literature, there are three concepts in SLT. Firstly, people can learn through observation, which is known as observational learning.

Secondly, mental states are an important factor in learning; it is also named intrinsic reinforcement, which refers to the point that learning does not necessarily lead to a change in behavior. Finally, this is followed by the modeling process.

### ***Observational Learning***

In 1961, Bandura conducted his famous experiment known as the Bobo doll experiment to study patterns of behavior. Similar behaviors were learned by individuals shaping their own behavior after the actions of models.



Bandura's results from the Bobo doll experiment changed the course of modern psychology from pure behaviorism to cognitive psychology. The study was significant because it departed from behaviorism's insistence that all behavior is directed by reinforcement or rewards.

The children received no encouragement or incentives to beat up the doll; they were simply imitating the behavior they had observed. Bandura termed this phenomenon "observational learning" and characterized the elements of effective learning as attention, retention, reproduction, and motivation. He demonstrated that children learn and imitate behaviors that they observe.

***Observational learning characteristics:***

- **A live model:** Demonstrates or acts out a behavior.
- **A verbal instructional model,** describes and explains a behavior.
- **A symbolic model:** Depicts real or fictional characters displaying behaviors in books, films, television programs, or online media.

***Intrinsic Reinforcement***

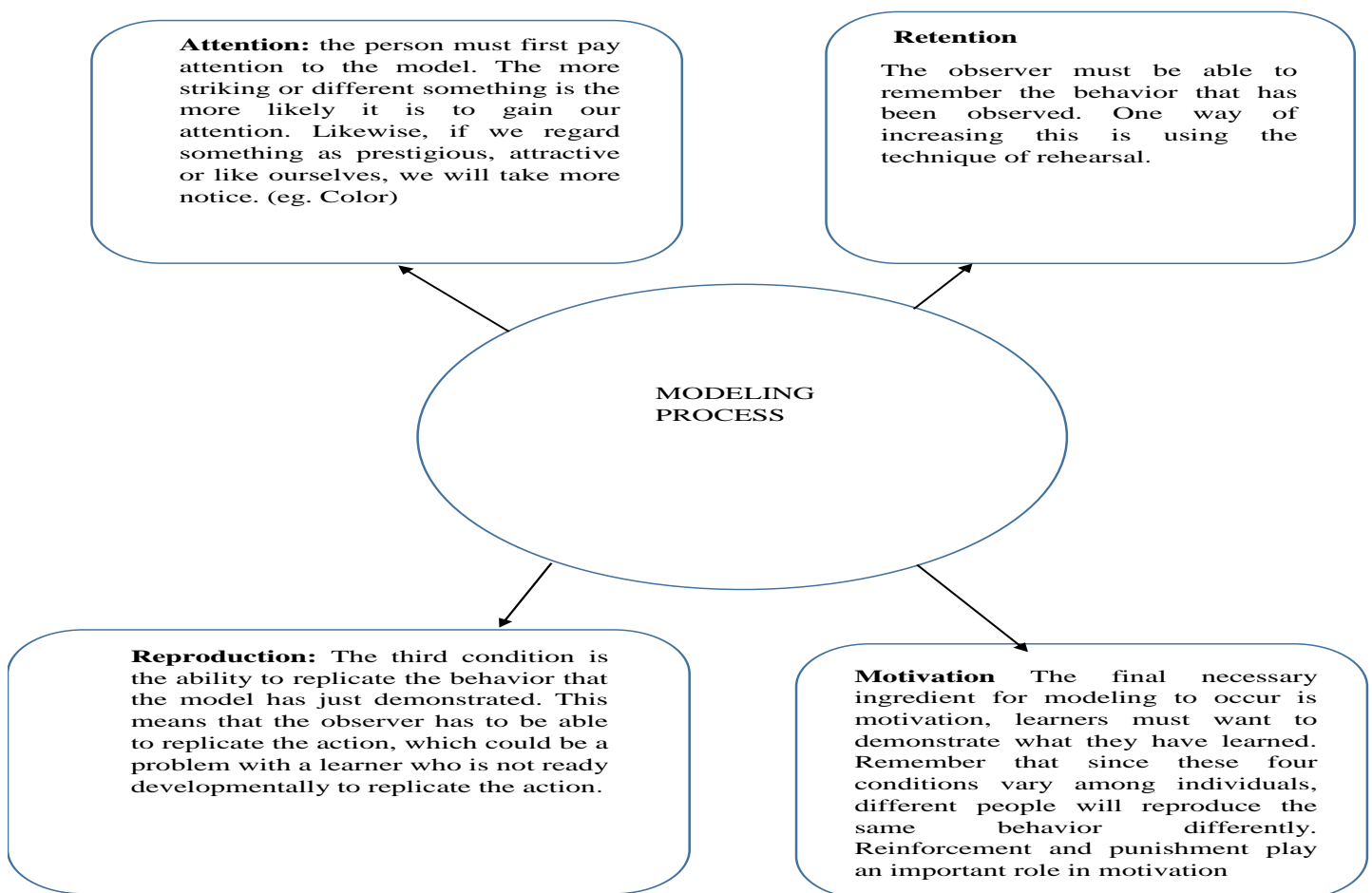
One form of learning, which is described as an internal reward, includes elements such as pride, satisfaction, and a sense of accomplishment. Based on some researchers, such as Muro and Jeffery (2008), who supported Bandura's SLT, they believe that this kind of learning places more emphasis on internal mechanisms.

However, in this regard, Bandura (1986) criticized this process and believed that external environmental reinforcement is not the only factor that influences learning and behavior.

***Modeling Process***

Bandura mentioned four necessary conditions for the modeling process. By considering these steps, an individual can successfully replicate the behavior modeled by someone else. These conditions are shown in Figure 8 below.





**Figure 9: shows four conditions necessary for modelling processes**

### *SLT Perspective*

From the SLT view, the perspectives of reinforcement and punishment (R & P) can be categorized as following:

Indirect effects on learning

They are not the sole or main cause that influence the extent to which an individual exhibits a behavior that has been learned.

Influences expectation, reinforcement on cognitive processes that promote learning.

Attention pays a critical role in learning and it is influenced by expectation of reinforcement.

### *Social Cognitive learning theory (SCLT)*

Based on the above discussion, SCLT is a learning theory based on the idea that people learn by watching what others do and that human thought processes are central to



understanding personality. By the mid-1980s, Bandura's research had taken a more holistic approach, and his analyses tended to provide a more comprehensive overview of human cognitive theory (Bandura, 1999). This theory provided a framework for understanding and predicting changes in human behavior.

### ***Basic assumption of SCLT***

Bandura argues that individuals learn both behavior and cognitive strategies by observing the behavior of others, and these acquisitions can be learned without direct reinforcement (Green & Peil, 2009). However, McCornick and Martinko (2004) claimed that: People can learn by observing others.

- Learning is an internal process that may or may not result in a behavior change
- Learning can occur without a change in behavior (observation without imitation)

Regarding behavior, some other researchers such as Betz (2007) supported Bandura's basic assumption of SCLT and pointed out that:

- Behavior is directed toward particular goals
- Behavior eventually becomes self-regulated
- Cognition plays a role in learning

Finally, some studies supported that reinforcement and punishment have indirect effect rather than direct effects on learning and behavior (Green & Peil, 2009).

### ***Phenomena of SCLT***

Social cognitive theory attempts to explain socialization broadly, including the processes whereby individuals acquire their society's norms of thought and action. Within this broad agenda, Bandura attempts to explain four types of learning effects:

Observational learning effects: acquiring new behavior from model

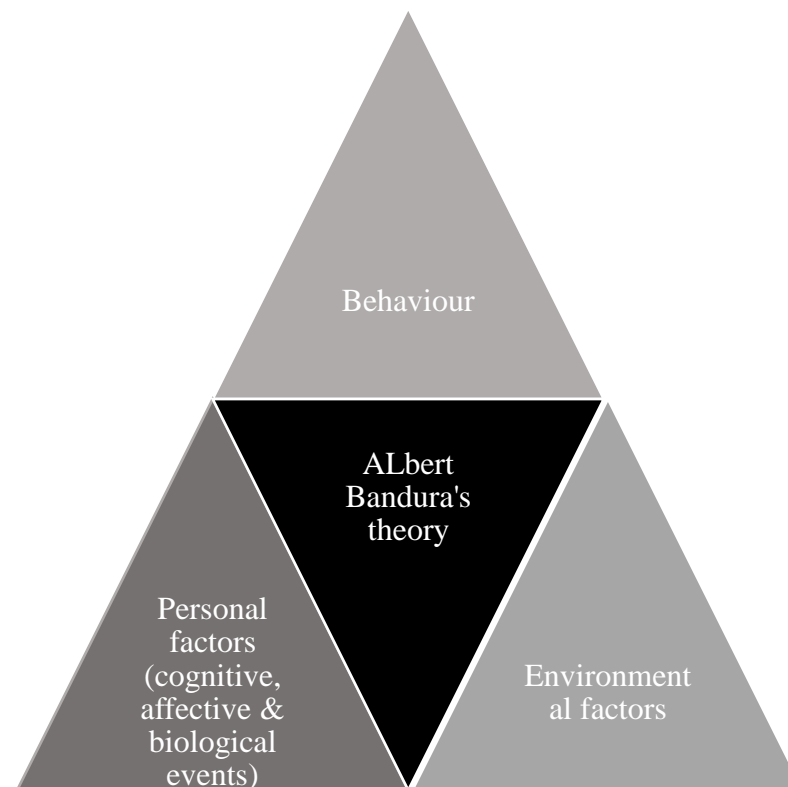
- i. Response facilitation effect: increase frequency of learned behavior after model is reinforce for same behavior.
- ii. Response inhibition effect; decrease frequency of learned behavior after observing punished model.



- iii. Response disinhibition effect: return of inhibited responses after observing model behave those adverse consequences.

### ***Internal principle of SCLT***

People are not just products of their environments. Equally important is the fact that we create beneficial environments carefully and influence what we become. Our choices are influenced by our beliefs as well as our capabilities (Bandura, 1997). Bandura proposes a single internal principle composed of three interacting elements. This principle is termed triadic reciprocity. Some scholars in the area of SCLT, such as Betz (2007) and Green & Peil (2009), supported Bandura's view of triadic reciprocity and defined human behavior as a triadic, dynamic, and reciprocal interaction of personal factors, behavior, and the environment. Upon closer observation, these three fundamental elements work in a reciprocal manner.



**Figure 10: internal principle of SCLT, source: Bandura theory**

### **1.6.6. Theory of constructivism**

Jerome Bruner proposed constructivism theory in 1966 (Olorode & Jimoh, 2016). The theory states that people construct their own understanding and knowledge of the world through experiences and by reflecting on those experiences. This theory is based on the principles of cognitive theory, hence it is sometimes referred to as cognitive constructivism.



Wnet (2004) explains that when we encounter something new, we have to reconcile it with our previous ideas and experience, perhaps by changing what we believe or by discarding the new information as irrelevant. In any case, we are active creators of our own knowledge. To do this, we must ask questions, explore, and assess what we know. This means that learning is an active process based on the assumption that knowledge is constructed by learners as they attempt to make sense of their experiences. This perspective maintains that people actively construct new knowledge as they interact with their environment (Adesanya, 2009).

In the classroom, the constructivist view of learning can be used to encourage students to use practical approaches to create more knowledge, reflect on, and talk about what they are doing. The theory emphasizes memorization but also considers the conceptions and definitions of others and insists that learners create their own definitions, meanings, and understandings through discovery. For instance, instead of asking students to memorize the traditional definitions of a phrase, students can construct their own definitions after exploring the position of a phrase in a sentence. Sometimes they achieve this when they work together with their peers. This leads us to the social aspect of constructivism.

### **Social Constructivism**

Social constructivism is a learning theory developed by Vygotsky in 1968. The theory states that language and culture form the framework through which humans experience, communicate, and understand reality. According to Vygotsky, language and culture play essential roles both in human intellectual development and in how humans perceive the world. This suggests that learning concepts are transmitted through language, interpreted and understood via experience and interactions within a cultural setting. Since it takes a group of people to develop language and culture to construct cognitive structures, knowledge, therefore, is not only socially constructed but co-constructed.

The link here is that while the constructivist sees knowledge as what students construct individually based on the experiences they gather from their environment, the social constructivist sees knowledge as what students, teachers, and peers construct together. Cognitive constructivism emphasizes the collaborative nature of learning under the guidance of a facilitator, collaborator, or with other students.



In social constructivism, children's understanding is shaped not only through adaptive encounters with the physical world but also through interactions with others, in relation to a world that is not merely physical and apprehended by the senses, but cultural, meaningful, and significant, and primarily shaped by language. Hein (1991) argues that the level of potential development (academic achievement) is the level of development that the learner is capable of reaching under the guidance of teachers or in collaboration with peers. He sees learning as a social activity associated with other human beings such as peers, family members, as well as casual acquaintances, including past generations. Social constructivism recognizes the social aspect of learning and the use of conversation, interaction with others, and the application of knowledge as an essential aspect of learning and a means to achieving learning objectives.

Vygotsky believed that the lifelong process of development is dependent on social interaction and that social learning actually leads to cognitive development. In other words, all learning tasks (regardless of their level of difficulty) can be performed by learners under adult guidance or with peer collaboration. This theory supports the establishment of opportunities for students to collaborate with teachers and peers in constructing knowledge and understanding.

Kapur (2018) observed that the social construction of knowledge takes place in various ways and across different locations. It can be achieved through group discussions, teamwork, or any instructional interaction in an educational or training institution, social media forum, or marketplaces. As students interact with their environment, they gain understanding and gather experience, which enables them to live successful and functional lives.

Social constructivism is also called collaborative learning because it is based on interaction, discussion, and sharing among students. This teaching strategy allows for a range of groupings and interactive methods. These may include whole-class discussions, small group discussions, or students working in pairs on projects or assignments. The underlying principle of the theory is that learners work in groups, sharing ideas, brainstorming, and trying to discover causes and effects, answers to problems, or creating something new to add to existing knowledge.



### **1.6.7. Stakeholder Theory**

Stakeholder theory presents an approach where several groups or individuals are impacted during the process of achieving organizational goals (Abdullah, 2009). The focus of stakeholder theory is defined in two questions. Firstly, what is the purpose of the company? This encourages managers to articulate a sense of unity on the values that they construct to bring stakeholders together. The second question examines what responsibilities management should provide to the stakeholders. This encourages managers to articulate how they want to lead organizations to create value, especially to meet stakeholders' goals.

Some researchers argue that this theory focuses on the managerial decision-making process by considering the interests of all stakeholders who have intrinsic value, rather than prioritizing dominant interests (Brown, 2001). Many researchers (Akomolafe & Ibiola, 2014) have studied university governance using the fundamental stakeholder theory. The study results consistently show that faculty participation is important in decision-making because faculty members possess better information and incentives than administrators. Another study reveals that reporting mechanisms implemented by university governance structures serve as a basis for performance appraisal and system improvement.

### **1.6.8. The paradigm of responsible management and learning**

The paradigm of responsible management differentiates between responsible business at the organizational level and at the individual level. The paradigm assumes that responsibility is necessary for the triple bottom line—environmental, social, and economic sustainability, which reflects stakeholder values (Laasch, 2015).

A recent study on responsible management by Nonet et al. (2016) defines responsible management as encompassing the development of formal knowledge, critical thinking, and soft skills as a broad and holistic framework for understanding sustainable development. The development of a shared vision for all stakeholders and a process of continuous improvement through self and group reflection are emphasized.

Laasch and Moosmayer (2015) conceptualize responsible management and learning as learning for SRE—sustainability, responsibility, and ethics—not only in explicit educational settings but also in the workplace and other implicit learning environments.



### 1.6.9. Conclusion

Chapter one permit us to analyze sustainable university governance in the lens of university sustainable politics, University sustainability culture, university sustainability practice, university sustainability knowledge and university sustainability management strategy. In this chapter, the researcher defined the concept of sustainable university governance and its factors, analyses how the variation of these factors affects the university and how they are applicable to enhance students' competence via conceptual, literature, and theoretical review. This chapter analyzes some few models and types of governance use by universities in the world. This chapter also analyzes the dimensions, framework, approaches, and the different strata of the university, laws and strategy papers use by state universities in Cameroon showing the zone of possibility of the integration and or association of sustainability in the system.

Public universities are organizations with a specific framework or a governance model that can be ameliorated by associating it with other models to enhance the competences of students for sustainable development. To enhance students' system thinking, critical thinking and problem-solving skills, there is the need to link university sustainability politics, culture, and practice, knowledge, and management strategy to the governance mechanism of the university. Public universities will need adequate framework that can formulate good policies, tap from the opportunities created by sustainability governance making use of management strategy which can help students to become responsible citizens as well as provide rational solutions to the issues of climate change, poverty, inequality, and water scarcity.



**CHAPTER TWO: STUDENTS' COMPETENCY IN  
EDUCATION FOR SUSTAINABLE DEVELOPMENT**



This chapter consists of concepts related to Education for Sustainable Development and a theory used to explain students' competency in sustainable development.

## **2.1. The Concept of Education for Sustainable Development**

Education for Sustainable Development (ESD) is a crucial aspect of modern education. It aims to equip students with the knowledge, skills, and values necessary to address the environmental, social, and economic challenges of the 21st century. According to the United Nations, sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." As the world faces increasing environmental challenges, such as climate change and resource depletion, it is crucial that students are equipped with the necessary competencies to address these issues in order to create a sustainable future (Rora et al., 2020).

Education for Sustainable Development encompasses a range of principles, such as environmental protection, intergenerational equity, decentralization, and policy integration, which adhere to education and awareness to foster understanding and knowledge of environmental issues and their interconnectedness with social, economic, and cultural factors (Galvão, 2015). These principles guide sustainable development policies and practices, aiming to create a more equitable, prosperous, and environmentally conscious future.

A clear correlation between education and development has been established over the last 40 years. However, the challenge faced by both old and new generations of education is sustainability. The concept connects and sustains the principles of education and sustainable development in the educational arena, which drives stakeholders' efforts to transform old traditional paradigms into new ones that address social demands.

There are possibilities for adhering to an innovative curriculum. However, using an effective sustainability framework to integrate and shape skills for sustainable development rather than relying solely on the curriculum is a great choice. This is because, in order to effectively integrate ESD principles into the university framework and curriculum, it is important to explore policies, culture, practice, knowledge, and strategies of universities, as well as their teaching methods, that have successfully developed students' competency in this area over time (Rehema et al., 2019).



Chapter 36 of Agenda 21 on Sustainable Development intends to redirect education towards sustainable practices by raising public awareness of quality education. According to this school of thought, the new design and approach to Education for Sustainable Development reflect the belief that it can only be realized through a reform of pedagogy and curriculum that focuses on the three dimensions of sustainable development for the integration of sustainable development principles and goals.

However, a good sustainability framework will emphasize building students' competency because it will address fluctuating issues of the economy and environment that the world of today and tomorrow will face. Without equipping students with the necessary competencies, future generations will lack the effective and efficient human capital needed to meet their own needs in terms of skills. By providing students with the knowledge to understand and address these challenges, universities create a sustainable future that preserves the environment for generations to come. Additionally, integrating sustainability into the university framework allows for the establishment of programs to equip educators with sustainability knowledge to effectively promote sustainability in classrooms (Rieckmann, 2018).

According to the United Nations, the pillars of sustainable development demonstrate the importance of sustainability in every sector, including education.

For most practitioners in education, if students are to learn to live more sustainably, they must develop competencies that enable them to become socially responsible citizens, systems thinkers, and problem solvers. That is, as socially responsible citizens, they will be able to promote ethical behavior and actions to live in harmony with the environment.

According to McClelland (1973), competency can be defined as a set of observable, measurable, and learnable knowledge, skills, and attitudes that allow an individual to perform a specific task or job satisfactorily. Linking this definition to sustainability-related skills, competency represents a complex, integrated set of knowledge, attitudes, and values that people apply in different contexts to address situations involving environmental, economic, and societal issues, as well as to act upon and transform reality according to sustainability



criteria. It involves the art of knowing what to do, which requires working with content related to the environment, culture, economy, and society.

### **2.1.1. Competency in education for sustainable development**

The conceptualization of competency in ESD and its expression in curricula is highly complex. Increasing attention is being given to the methods that state universities worldwide and their stakeholders can use to foster students' CESD. However, defining the types of competency for each context is relevant in addressing its developmental needs. Competence can be defined as the integration of knowledge, skills, values, and attitudes (McClelland, 1973). Competence embraces much more than just knowledge and cognition; it extends to physical abilities. A school of thought defines competence as "the ability to successfully meet complex demands in a particular context through the mobilization of psychological prerequisites that include both cognitive and non-cognitive aspects" (Demetrious & R. K. Wagner, 2001, pp. 283-310).

Competence can be basic, fundamental, key, and interdisciplinary, depending on the context. It is relevant to everyone, especially students who are future professionals expected to deal with multiple challenges of modern societies, such as globalization and modernization (Barth et al., 2007). Students' action for sustainable development is reflected in their ability to mobilize cognitive and practical skills, as well as social and behavioral components, such as ethics, empathy, emotion, and motivation. Competence as a holistic notion is therefore not reducible to the cognitive dimension alone. Since competence is not limited to a specific aspect of the university, competence in education for sustainable development can enable students to gain important knowledge, values, attitudes, and skills that they will require in their future profession and personal lives.

Rychen (2002) affirms that it is easier to use competence to assess students and improve processes regarding the abilities they acquire to face life's challenges. It facilitates the setting of educational goals, which improves educational systems and lifelong learning processes. Although the advantages are clear, the concept and process of defining competencies must be perceived with caution since this concept is based upon values, attitudes, and ethics. It is very important that both private and public universities in Cameroon build strong relationships with



labor markets in order to master the complexities and dynamics regarding the types, quality, and levels of skills needed. Such a mutual relationship will enable both parties to balance the supply of skills with the demand for skills. However, such a balance will be difficult to attain as long as the two parties remain distant. The closer the two sectors are, the greater the opportunity to identify strengths and weaknesses related to skills for sustainable development. For instance, universities could understand what kind of skills are in demand for the green economy and articulate training towards green practices.

On the other hand, labor markets could share best green practices with universities based on their experience in the global market and help universities avoid programs that are no longer in demand.

According to Islam (2019), the failure of universities to grow stems from poor marketing strategy, a weak image, and a lack of capacity building suitable for industries. Additionally, failure to establish a strong link with the labor market prevents responsiveness to the skills needed by industries.

Competence represents a qualitative change in the way we understand human learning and skills. Developing skills for sustainable development requires a completely new, systematic, and holistic dimension; it implies a new conception in learning and professional training. Sustainable development programs serve as a reference point in the process of selecting key competencies for tertiary education.

Nonetheless, literature deals with competence in general, including sustainability skills, since competences are associated with skills, capacities, and qualifications (Baartman & al., 2007). The European Commission's high-level group (2019) defines competence as the ability to mobilize and apply knowledge, skills, attitudes, and values in order to respond effectively to complex demands in a particular context, taking into account the social, emotional, and motivational aspects of performance.

This definition builds on the Berlin Model and provides a more specific, comprehensive, and contemporary understanding of competence. It emphasizes the importance of:



- Mobilizing and applying knowledge, skills, attitudes and values
- Responding effectively to complex demands
- Considering the social, emotional, and motivational aspects of performance.
- Contextualizing competence in a specific setting or situation.



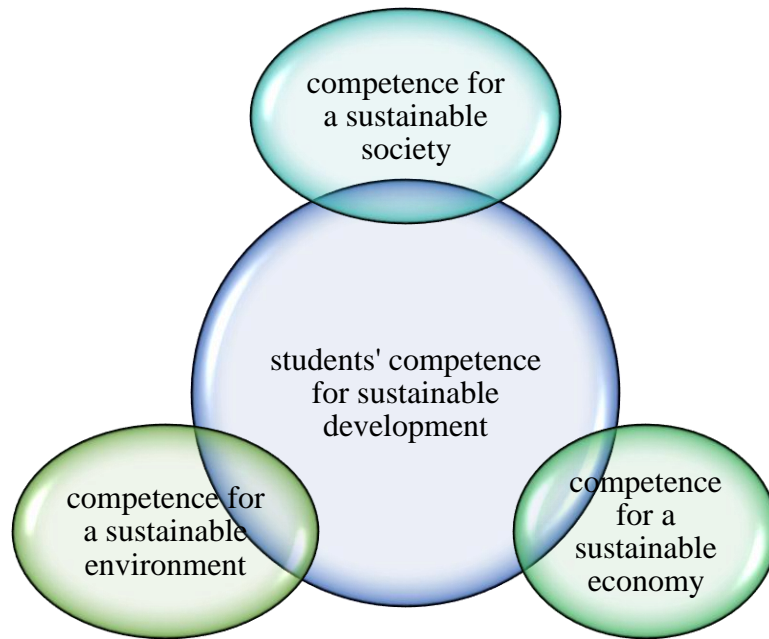
### **2.1.1.1. Students' competency in education for sustainable development**

Competency as defined in education for sustainable development (ESD) permits the enhancement of students' skills, enabling them to make informed decisions and take responsible actions for environmental integrity and economic viability, while promoting principles that enable a just society. Students' CESD equips them with the ability to be lifelong learners, which is an integral part of their lives. Such competence can only be developed when the university integrates principles of sustainability into their system. Since universities are transformational systems that are autonomous and responsible, they are expected to address the curriculum, pedagogy, and learning environment to stimulate learning while promoting core competencies, such as critical thinking, systemic thinking, and collaborative decision-making.

According to Rieckmann (2007, pp. 127-135), in order for university managers to promote sustainable development, they can begin by selecting key competencies for sustainable development. However, universities deal with competencies in general and specify sustainability issues only in some areas of their programs. Wiek and Redman, in their sustainability educational research, reveal a certain convergence in key competencies that can be used to develop students' sustainability competence. The authors show that competencies essential for sustainable development in the university are not sufficiently justified and developed. Similarly, there are still very few cases where sustainability curricula have been successfully integrated on a large scale. This is partly due to the lack of research on sustainability competencies and partly due to the lack of a good sustainability framework for its integration.

Researching which types of competencies in sustainability students must possess to meet current and future demands of society, the economy, and the environment can help assess the degree of preparation achieved by students in addressing the challenges of sustainability. Thus, students' competency for sustainable development can be enhanced through the three main dimensions of sustainability, namely: students' competency for a sustainable society, students' competency for a sustainable economy, and students' competency for a sustainable environment.





**Figure 11: Three dimension of students' competence for sustainable development**

#### 2.1.1.2. Students' competence for a sustainable society

According to Roos (2015), much work remains to be done in sustainable development, ethics, and social responsibility. Educating for sustainable development, according to Rieckmann, aims to support students' competency in reflecting on their own roles in actively promoting global and social sustainability, both now and in the future. In this context, Roos examined sustainability in business schools. The author advocated for a more holistic education by referring to Aristotle's practical wisdom, or *phronesis*, which incorporates emotional and spiritual elements in learning situations. For students to be competent in addressing complex challenges such as moral dilemmas, they need not only analytical and cognitive skills but also critical reflection and discussions.

To develop practical wisdom and act sustainably, students must be competent enough to continuously balance collective and individual interests, short-term and long-term goals, and the choice between adapting to or shaping their environment. According to Missimer et al., trust and social cohesion are crucial elements for maintaining a socially sustainable and diverse context (Missimer, M., Robert, K.-H., and Broman, 2017, pp. 42-50).



These contexts must foster both the capacity for learning and the ability to self-organize. Competency in the social dimension addresses issues of inequality and power while integrating ethics to resolve practical challenges.

Leal Filho and colleagues advocate for a multidisciplinary approach to developing competency in the social dimension. In this approach, global themes are incorporated into the institutional ethos. Sustainability is not only a topic for learning and teaching but also a way of relating to the world, through activities ranging from discussion to planning and practice.

According to the authors, issues such as fairness, tolerance, and responsibility become part of university life. In this case, universities serve as models of sustainability, initiating a transformation towards sustainable solutions. Sustainability ethics thus becomes part of the university's teaching, learning, and research programs, campus operations, and interactions with the broader society.

In a world where sustainability has become essential, universities need to play a noticeable role. This role depends on the activities undertaken by both internal and external stakeholders, thus linking the university with the real world. Hence, sustainability emerges as a new educational project and simultaneously a dynamic yet flexible synergy through which science, education, and art transform and develop students (Leal Filho, W., et al., 2018, pp. 286-295).

It should also be noted that universities are heavily influenced by politics at both the national and international levels. As a result, the university's vision and strategies reflect a wide range of societal ideas and trends. For example, if society serves as the guiding star, then leaders are responsible for implementing the demands of societal forces. To succeed in becoming more sustainable, educational institutions require leaders who can provide a vision, set the direction, and motivate people to embrace sustainability values. Sustainable leaders and organizations bear social responsibilities beyond their immediate context and must engage their stakeholders to bring about long-term changes.

The social dimension of sustainability has been investigated and interpreted less frequently than the ecological (environmental) and economic dimensions. However, increasing



efforts have been made to implement social sustainability principles. Dillard et al. noted that the tripartite understanding of sustainability has sometimes been framed as environment, economy, and equity in urban planning, but social sustainability is often reduced to equity, without deeper consideration of its broader requirements or sufficiency. This highlights the need to define students' competence for societal sustainability.

### **2.1.3 Students' competence for a sustainable economy**

The urgency of transitioning to a sustainable economy demands a fundamental transformation in educational paradigms to equip students with the necessary knowledge, skills, and attitudes. Building on foundational studies by Sterling (2001), Orr (2004), and Wals (2015), this review investigated the relationship between education, sustainability, and economic development. The analysis showed that one notable trend in fostering students' competency for a sustainable economy is the growing emphasis on interdisciplinary learning. Smith et al. (2023) argue that traditional disciplinary boundaries are increasingly blurred as educators recognize the interconnectedness of environmental, economic, and social systems. By integrating sustainability principles across diverse academic disciplines, students gain a holistic understanding of sustainability issues and develop the critical thinking skills necessary for effective problem-solving.

Competency for a sustainable green economy entails developing green skills. These skills are necessary to sustain industrial processes, financial systems, employment structures, and consumption patterns (Janicke, 2012). The competence required includes improving resource management, decarbonizing energy supply and production systems. These competencies are essential for individuals to develop eco-literacy and secure green jobs, hence the term "competence or skills for a green economy."

A green economy is one that leads to the improvement of human well-being by significantly reducing environmental risks and ecological scarcity. It is not only concerned with eco-activities and green jobs but also with promoting efficiency in the use of natural resources and fossil fuels, as well as reducing pollution, emissions, or waste. It suggests production and consumption patterns that impact every sector's activity.



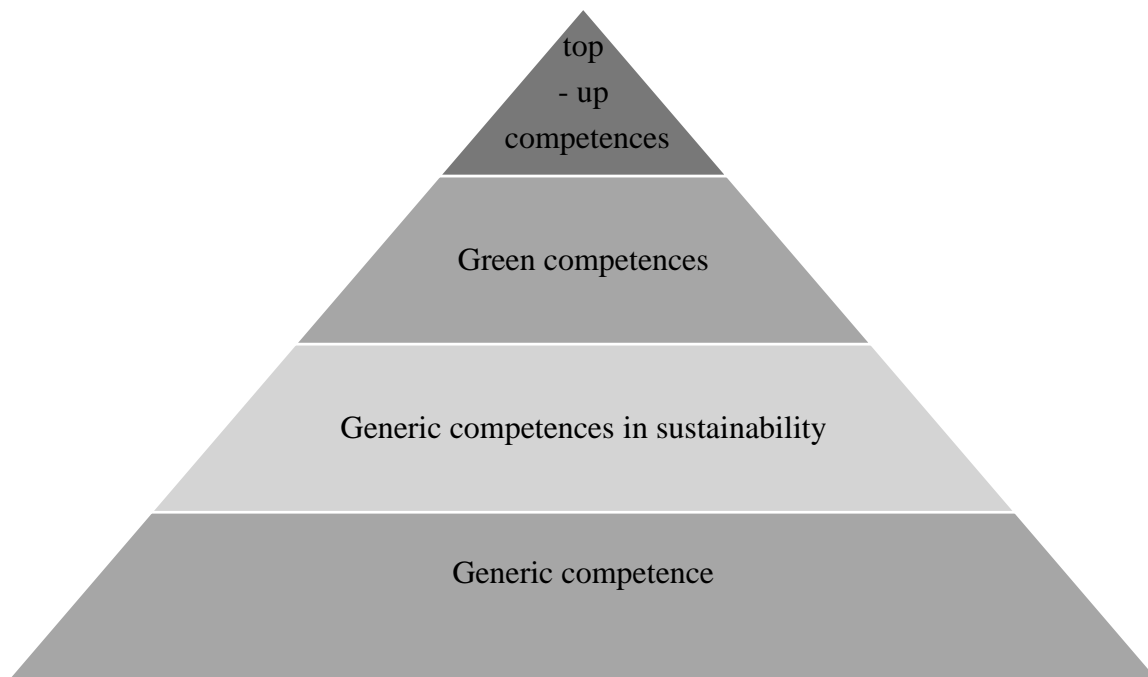
Traditional sectors, driven by this green tendency, feel encouraged to adapt to new market conditions and demands, increasing market competitiveness. A transformation across all sectors is thus initiated through green growth. In this sense, such a transformation affects all professions to varying degrees (European Commission, 2013).

The above discussion suggests that the transition towards a sustainable economy anticipates an increase in jobs within the green economy sector. For example, professions related to waste collection and recycling, renewable energies, or natural resource management require individuals equipped with specific skills. This transition implies that professionals currently in traditional jobs will need to update their skills to acquire the competencies necessary for sustainable development. Additionally, the general population—the potential consumers of green products and production processes—must also develop sustainability competencies to appreciate the advantages of new economic models.

These competencies are crucial for any citizen in a sustainable society. They may even be more relevant than highly specialized technical green skills in a particular sector, as they drive mental shifts that reshape social patterns and lifestyles. By doing so, they foster changes in production and consumption models, creating the conditions necessary for the development of a green economy.

There are four key types of competencies for a sustainable society. All of them are essential for students to contribute to the future viability of society.





**Figure 12: Competences and skills needed for a sustainable economy.**

The figure above illustrates the degree of specialization of different types of competencies required for university students. Garcia (YEAR) provides a comprehensive exploration of green competencies, highlighting their critical role in driving sustainable innovation. Through a blend of theoretical insights and practical examples, the author emphasizes the importance of equipping individuals with the skills and knowledge necessary to address pressing environmental challenges. This contribution offers valuable guidance for educators, policymakers, and industry stakeholders seeking to cultivate a workforce capable of catalyzing the transition towards a green economy.

Generic competencies in sustainability must be acquired entirely by students. The specialized green skills serve as an enhancement to existing competencies in sustainability. However, certain competencies are exclusive to graduates of specific programs. The four types of competencies represent progression from a traditional society to one characterized by sustainability in its development. From this perspective, generic competencies form the first level of advancement and serve as the foundation for the other three types. Above them are the generic competencies in sustainability, which are equally necessary for every citizen. At the third level are specialized green skills, which have a technical focus and do not apply to the entire population. Finally, the highest level involves "topping up" existing competencies in



sustainability to foster dynamic leadership in social processes of sustainable development. Societies rely on education at various levels and in different modalities as an indispensable instrument to facilitate the acquisition of these competencies by citizens.

#### **2.1.1.4. Students' competence for environmental sustainability**

Students' environmental sustainability competence measures their ability to reduce carbon dioxide emissions by minimizing toxic water waste, preventing littering, promoting green energy consumption, and adopting clean technology to enhance environmental performance. According to Li et al. (2014, p. 231), environmental competence positively influences environmental performance. Their study demonstrates that experience and knowledge in green building projects are essential for improving students' environmental sustainability competence. A few studies have analyzed the impact of specific types of environmental competencies on organizational performance. These studies use variables such as green transformational leadership and employees' environmental awareness. The results indicate that environmental competence should be proactively developed by organizations that emphasize sustainable practices.

Another example is entrepreneurial thinking, which is defined as a skill essential for a change agent in sustainability. Students trained in sustainability become actors who actively address social and ecological problems through entrepreneurial approaches, integrating sustainability management into organizational practice (Hesselbarth & Schaltegger, 2014, p. 26). A review suggests that environmental competencies among managers can stimulate the development of environmental capabilities in students at universities. In a corporate sustainability context, transdisciplinary responses are critical, beginning with awareness creation among managers, followed by students. For instance, carbon footprints, energy consumption, and waste management serve as input for collaboration between different functions within an institution. These collaborations ultimately result in organization-wide sustainability strategies and integrated solutions. Findings on the impact of environmental competencies underscore the importance of a transdisciplinary approach in problem-solving and organizational learning (Elliot, 2013, p. 280).



The review conducted by Van Wijk et al. (2011) emphasizes eco-centric culture, eco-centric values, and the role of managerial motivation and cognitive styles. The research indicates that the antecedents of sustainability-driven values differ from those in traditional business contexts. A key contextual factor is the pressure from consumers and regulators demanding environmentally friendly products. This external pressure drives the development of environmental competence and influences students' absorptive capacity by shifting the focus towards creating public value or balancing both public and private interests.

## **2.2. Empirical framework of competency in education for sustainable development**

According to the United Nations, sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." As global environmental challenges escalate, it is crucial to equip students with the necessary competencies to effectively address these issues and contribute to a sustainable future (Bruggemann, 2020). Some key competencies in education for sustainable development include critical thinking and problem-solving skills to analyze complex environmental challenges. Additionally, collaboration and communication skills enable students to work effectively with others in developing sustainable solutions, alongside a deep understanding of ecological systems and their interconnectedness.

By developing these competencies, students can actively contribute to sustainability while safeguarding the well-being of both present and future generations. As Fahriye (2021) notes, "Universities can facilitate interdisciplinary collaboration by bringing together students and faculty from different disciplines to collectively work on sustainability challenges." For example, a study by Smith et al. (2018) found that while students generally had a basic understanding of environmental issues, their ability to apply this knowledge to real-world situations was limited. This highlights the importance of competency development in education for sustainable development—going beyond theoretical knowledge to enable students to address environmental challenges in practical contexts. Numerous models exist for sustainable development; however, this study will present a selection of the most relevant models.



### 2.2.1 Overview of competence in education for sustainable development in universities

According to Wienert (2000, pp. 1-16), competence in the context of the university specifically lays emphasis on the acquisition of a number of sub-competence categories under the term "shaping competence," which involves attitudes and behaviors needed to act and solve problems. Students to whom these competences are transferred actively participate in shaping the society's future to guide social change along the lines of sustainable development. Shaping competences encompass eight sub-competences, which serve as the basis for formulating educational standards.

- **Competence for future thinking**

This skill helps students imagine and shape a desirable future through visioning, scenario-building, and strategic planning. The capacity to deal with uncertainty and future prognoses, and the expectation to think beyond the present. It is essential to view the future as open and able to be shaped. This attitude gives the ability and capacity to develop different options for action based on present conditions. Through foresighted thinking and acting, good programs for learning can be conceived and training for the future can be designed. Creativity and imagination play a role in this competence.

- **Competence in interdisciplinary work**

This skill helps students to work with others to achieve shared goals and build collective knowledge. A single scientific field and strategy for acting are no longer sufficient to tackle the pressing issues of unsustainable development and the need for future compliance with change. These problems can only be addressed through the collaboration of many scientific fields, using different cultural approaches. Knowing how to identify and understand systemic relations and how to deal appropriately with complexity requires the development of corresponding skills. These skills can be further developed through approaching problems in daily-life contexts with a problem-solving strategy that opens up opportunities for positions and different ways of thinking.

There are two types of interdisciplinary learning.

- **Subject related interdisciplinary**

It involves the cooperation of related fields that typically work with similar methods, conceptual approach and terminologies



- **Problem orientated interdisciplinary**

This approach enables the cooperation of various fields to tackle a specific problem which cannot be adequately tackled by a single group in one field. These problems are so complex and need to be addressed by different scientific methods using knowledge from economics and geography, for example. Climate change cannot be explained from the perspective of a single field.

- **Competence in cosmopolitan perception, transcultural understanding and cooperation.**

This sub-competence aims at contextually and horizontally expanding perceptions because regional or national perspectives are too narrow for orientation in a complex global society. Students must transcend the horizons of their perception and judgement to strive for a global view. This requires that they promote a basic attitude of curiosity and develop an interest in the affairs of people from other regions of the world, and the desire to learn from them.

- **Participation and engagement competence**

These skills are important in encouraging active citizenship, community involvement, and social responsibility. This gives students the capacity to participate in shaping sustainable development processes. The reason for this lies with the action focus inherent within sustainable development. Such concepts are based on the realization that sustainable development cannot just be achieved through state intervention, legislation, new technology, and efficient economies, but requires passive and active support from the population.

### **Competence for planning and implementation**

The capacity to assess resources necessary for an action, and their availability, from the standpoint of sustainability. The capacity to create cooperative networks and to calculate side effects and possible surprise effects, as well as to take the possibility of their occurrence into account while planning. A significant factor in developing planning skills is learning to consider the changes of knowledge relevant to planning. Such learning draws attention to correlations between various problem constellations and possible outcomes.

### **Competence for empathy, compassion and solidarity**



All conceptions of sustainability aim at promoting more justice, which calls for a just balance between the poor and the rich. Engagement in this area requires competence in transcultural communication and cooperation, as well as a certain empathy. Education for sustainable development here aims to develop students' collective competence in communicating for international solidarity. It motivates and enables people to work together to find future-compliant solutions to shared problems and find responsible ways to achieve more justice.

- **Competence for self-reflection and self-awareness**

This skill helps students to continuously learn, reflect, and improve themselves in ESD. Engaging in sustainable development requires a greater deal of motivation to change oneself and to encourage others to change as well. Educating for sustainable development aims to train motivationally driven students who are self-motivated to motivate others in a cultural perspective.

- **Competence in distance reflection on individual and cultural models**

Many of the sub-competencies demand a considerable amount of ability and self-knowledge from students for cosmopolitan perception.

- To identify and critically examine one's own interests and desires, to situate oneself in one's own cultural context.
- To take a position in the debate about global justice.
- Reflecting on individual and cultural models in a detached, objective manner.



### 2.2.2. Significance of competence in different university context

Competence is viewed as the ability to perform tasks according to the expected standard (Schneider, K., 2019, pp. 1-10). He specifies that the concept can be summed into a set of integrated abilities. From such, one can say that it is a set of knowledge, skills, and attitudes needed to accomplish a specific task. In both definitions, abilities are seen as actions. However, a suitable expression would have been "action type" for an essential characteristic; it is not a matter of " $\alpha$  can perform a specific action, but rather of such statements to which  $\alpha$  is ascribed for the performance of an action of a specific sort." Klieme et al. (2008) see competence as a set of dispositions. "The expression emphasizes that competence is something 'constructed' that can at most be indirectly interpreted and that is not like observational concepts that are directly related to visible objects." Blömeke et al. (2015) and Jacques (2016) argue that competence is a process that is a continuum. They view competence as a dynamic concept that can evolve over time. This contrasting viewpoint highlights the different perspectives within the field and adds complexity to the discussion.

Hager and Gonczi (1996) define competence as a relation between abilities or capabilities and the completion of a task. In this context, "ability" refers to specific skills, knowledge, or attributes which enable an individual to successfully perform an action of a certain type. These abilities are essential for the effective completion of tasks related to the specific action type. For instance, an example of the ascription of an ability could be an agent ( $\alpha$ ) being able to perform an action of type h ("problem-solving"). This ability is demonstrated when  $\alpha$  is in circumstances that are suitable to successfully and consistently perform the action.

Thomann (2010, p. 22) views competence as being related to the result of a concrete task. If a successful performance of an action of a specific type h is related to that of a specific action of that type q, then the second relatum would be a component of the concept of the former. The concept of relation, whose higher-level concept is that of structure, designates a relation or a relationship among several objects, an entity, or event. From the point of view of Short (1985), competence is a quality or state of being, and Fernandez et al. (2012) define competence as a behavior of integrating and combining internal and external resources. Therefore, competence can be defined as a process of cohesive construction of skills, knowledge, attitudes, and behavior about a task. In spite of their different perspectives and terminologies, the national and international documents produced for the educational system refer to three general objectives of the educational process for the development of competence:



- Developing an aptitude for lifelong learning
- Furthering a process of personal building of one's own personal life
- Promoting an idea of citizenship based on awareness, responsibility and active participation.

Each of these goals requires the development of its competence through education. Some documents lay more emphasis on the definition of what competence is and why it is important, while others are more concerned with the description of the type and level of competence envisaged. In most cases, national curriculum documents emphasize why certain competences are considered important and describe them with regard to:

- Motivation: Essential for achieving the general objectives
- Categories: Basic, technical-professional, cross-curricular competence
- Types: Environmental, social, and economic
- Features: Dynamic, specific to contexts, generalizable
- Components: Knowledge, skills, attitude.

In general, competences are considered as threshold or base, essential, or key. Many countries refer to specific aspects of the general objectives of the educational process with regard to the significance of competences to address their needs. For example, in French-speaking Belgium, competence is known as 'socles de compétences' necessary for social integration and the continuation of studies. In Luxembourg, it is known as 'compétences de base' which are necessary for further learning and study. In Spain, it is referred to as 'competencias esenciales' and is necessary for good citizenship in today's society. In the UK, it is known as 'key competences and/or skills' which are necessary for membership in a flexible and competitive workforce as well as lifelong learning. In Germany, 'Schlüsselkompetenzen' are essential for operating effectively on a personal and professional level, and in Flemish Belgium, it is known as 'sleutelcompetenties' and is described as being transferable, applicable in different contexts, situations, and polyfunctional in terms of attaining various kinds of objectives, solving problems, and performing tasks. In Cameroon, competence is still in an infancy stage; here, knowledge is transferred, thus, cognitive competence is necessary for good citizenship, social integration, and promoting national cohesion. Over the past ten years, two documents have become the reference point for all European educational systems: the "Recommendation of the European Parliament and of the Council on key competences for



lifelong learning” (KCLL, 2006) and the “Recommendation of the European Parliament and of the Council for the establishment of the European Qualifications Framework for lifelong learning” (EQF, 2008). Both provided descriptions rather than definitions of elements considered as constitutive competence and reasons for its importance.

In the KCLL documents, competence is described as “a combination of knowledge, skills, and attitudes appropriate to the context.” "Key competencies" are those which all individuals need for “personal fulfilment and development, active citizenship, social inclusion, and employment.” In this sense, knowledge, skills, and attitudes would seem to be associates of competence, i.e., parts of a whole, called competence, which allows an individual to deal with a given situation.

But where do the knowledge, skills, and attitudes come from? How can a person possess them in order to have them ready to face situations? Knowledge is the result of the assimilation of information through learning, the set of facts, principles, theories, and practices related to a field of work or study described as being “theoretical and/or practical.” The problem with this description is that, firstly, it begins with the question of finding the right knowledge and how the knowledge is constructed. Secondly, it seems to suggest that the body of knowledge to be learned already exists as a given set related to a given field. If the process of assimilation is at the heart of knowledge building, in which new information is incorporated into existing information already stored in existing cognitive structures, surely this process of construction would be considered a type of competence.

### **2.2.3. Domains of competence for ESD**

According to De Haan (2016), competence is categorized into six domains:

Personal Domain: Self-awareness, self-regulation, and motivation

Social Domain: Interpersonal skills, communication, and relationship building.

Cognitive domain: Thinking, problem-solving, and decision-making

Emotional Domain: Intelligence, empathy, and self-awareness.

Physical Domain: Physical skills, coordination, and health.

Practical Domain: Practical skills, such as planning, organizing, and time management

These domains can be summarized into three main domains, cognitive, interpersonal and intrapersonal domains.



### ***Cognitive domain (knowledge and thinking)***

This domain includes competences related to knowledge, understanding, and thinking skills, such as:

- Knowledge and facts
- Comprehension and interpretation
- Analysis and problem-solving
- Critical thinking and evaluation

### ***Interpersonal domain (social and communication)***

This domain encompasses competences related to social interactions, communication, and relationships, including;

- Communication and expression
- Collaboration and team work
- Empathy and social skills
- Conflict resolution and negotiation

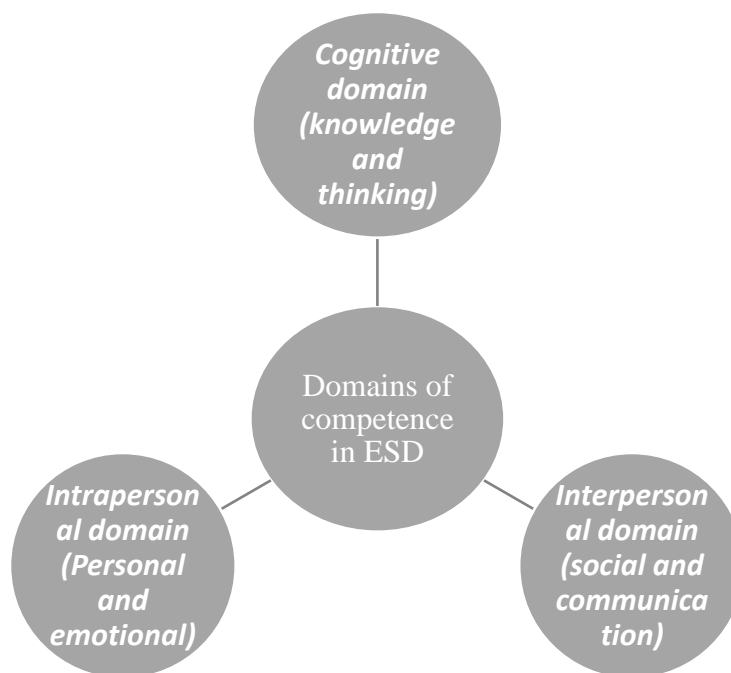
### ***Intrapersonal domain (Personal and emotional)***

This domain focuses on competences related to personal qualities, emotions and self-awareness, such as:

- Self-awareness and reflection
- Emotional intelligence and regulation
- Motivation and resilience
- Personal values and ethics

These three domains are interconnected and overlap, but categorizing competences into these domains helps to organize and understand the different aspects of human abilities and behavior.





**Figure 13: Summary of the domains of competence for SD**

According to De Haan (2016) the domains of competence are further categories as;

#### Interactive use of media

- Competence to take on new perspectives: ability to build up knowledge with open mind and new attitudes
- Competence in anticipation: ability to analyze and assess development with foresight
- Competence in interdisciplinary knowledge acquisition: gaining knowledge and being able to act at an interdisciplinary level.
- Competence in dealing with incomplete and overly complex information: recognizing and weighing up risks, dangers and uncertainties.

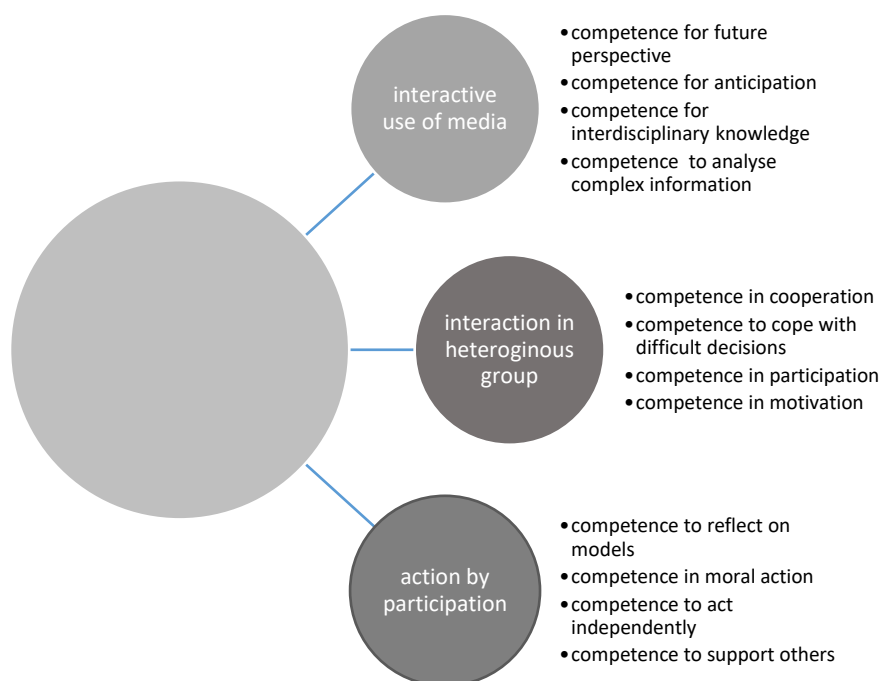
#### Interaction in heterogeneous groups



- Competence in Cooperation: ability to plan and work together with others
- Competence to cope with difficult decisions: ability to consider conflicting goals when reflecting on strategies for action
- Competence in participation: ability to participate in collective decision-making and development processes
- Competence in motivation: ability to motivate oneself and others to become active.

### Acting competence

- Competence to reflect on models: ability to reflect on one's own models and those of others
- Competence in moral action: ability to use ideas of justice as a basis for decision-making and action
- Competence to act independently: ability to plan and act independently
- Competence to support others: ability to show empathy for others.



### 2.2.4. Key competence in ESD

Competency which implies knowing how to act a particular context

**Table 1: key competences for ESD (Source: based on Wiek et al. 2011, p. 207-211)**

Name of key competence	Definition
------------------------	------------



Systems-thinking competence	‘The ability to collectively analyze complex systems across different domains (society, environment, economy) and across different scales (local to global), thereby considering cascading effects, feedback loops and other systemic features related to sustainability issues and sustainability problem-solving frameworks’
Anticipatory competence	‘The ability to collectively analyze, evaluate, and craft rich “pictures” of the future related to sustainability issues and sustainability problem-solving frameworks’
Normative competence	‘The ability to collectively map, specify, apply, reconcile, and negotiate sustainability values, principles, goals, and targets’
Strategic competence	‘The ability to collectively design and implement interventions, transitions, and transformative governance strategies towards sustainability’
Interpersonal competence	‘The ability to motivate, enable, and facilitate collaborative, participatory sustainability research and problem solving’

Competency which implies knowing how to act in a particular context can be said to have four characteristics, namely: **competency is interventional (operational) and goal oriented:** It implies **action competence** – involving the ability to initiate action independently without being told or instructed to do so; it cannot therefore be dissociated from activities

- **Competency is contextual or structural:** It combines the **desire, possibility, and ability** to act in a particular context that is: it is well defined; it is linked to a specific life situation and therefore has a context
- **Competency is learned or acquired:** A person becomes competent through personal and social interactions and constructions; nobody is born competent
- **Competency is abstract and hypothetical thinking:** Only the manifestations and consequences of competency can be observed; competence in the real sense of the word cannot be observed.



**2.2.5. Approach to Competence for sustainable development according to Mochizuki, V. & al., (2018), Baartman & al., (2007), Rieckmann, & Sanusi, (2011), Ayşe Ceren Atmaca, Seyit Ahmet Kiray & Mustafa Pehlivan (2019).**

The approach to competence for sustainable development is often categorized into three main areas:

➤ Knowledge and understanding

This area focuses on acquiring knowledge and understanding of sustainable development principles, concepts, and issues.

➤ Skills and abilities

This area emphasizes skill development and the ability to apply knowledge and understanding in practical situations such as: critical thinking and problem-solving, communication and collaboration, analysis and evaluation, planning and implementation.

➤ Values and attitudes

This area highlights the importance of developing values and attitudes that support sustainable development such as: empathy and social justice, respect for diversity and inclusivity, responsibility and accountability, future thinking, and visioning.

According to Kogan E. Y. (2004) in Bositkhonovich (2019), the competence approach is a new approach that requires revision of the attitude of students; this approach leads to global change, that is, from changes in consciousness to changes in the methodological framework. Bermus A. G. (2005) emphasizes that the competence approach is considered a modern correlate of many more traditional approaches in relation to education. Ivano D.A (2003) notes that the competence approach is an attempt to bring mass schools in line with the needs of the labor market, an approach that focuses on the result of education, and the result is not the amount of information learned but the ability of an individual to act in a certain situation.

According to Lebedeva O.E (2004) in Bositkhonovich (2019), the competence approach is a set of general principles for determining the goals of education, selecting the content of education, organizing the educational process, and evaluating educational results.

Among these principles are the following: the aim of education is to develop students' ability to solve problems in various fields because of social experience, which is an element of their experience. The content of education is a didactically adapted social experience of solving cognitive, ideological, moral, political, and other problems.



Developing students' competence for sustainable development in state universities is essential for green economics, social cohesion, and environmental hygiene. University governance that focuses on students' competency is experiencing a significant shift from student development to organizational performance.

However, a body of literature recognizes how sustainability governance influences students' competency in terms of knowledge, attitude, and behavior. Thus, permitting the definition of the type of competence to be developed and the approach to use in a context.

Competence in sustainability is defined by Mochizuki, V. & al. (2018) as a complex of knowledge, skills, and attitudes which enables successful task performance and problem-solving related to real-world sustainability challenges.

Whereas other authors view it as the active combination of knowledge, abilities, and intentions that enable students to successfully respond to changing conditions of society, environment, and economy (Lozano et al., 2013).

The competence approach focuses on output, whereas conventional syllabuses and didactic approaches focus on input. The latter raises the question of which subjects students should study. By contrast, the output approach asks what problem-solving strategies, concepts, and abilities for social action they should have. A school of thought seeking to answer such questions stipulates that it ranges from a simple "add-on" to the existing curriculum to a complete transition.

Cotton et al. (2009) point to the importance of so-called "second-best solutions" for integrating ESD within the current framework of universities. Other authors point out that the integration of competences for ESD could be a first stepping-stone toward sustainable education and serve as the basis for change in university curriculum and pedagogy. Competence for ESD exists in various forms, definitions, settings, and interpretations.

Several authors define competences as a set of knowledge, skills, attitudes, and values necessary to ensure that students are able to cope with the complexity and uncertainty of sustainability issues. Although using different methods to define and cluster competences for ESD, all sets cover comparable elements, as described by Wiek et al. (2011).

According to an author like Baartman & al. (2007), to achieve the goal of developing competence in education for sustainable development, it is important to adopt a holistic approach that incorporates various components.

- Knowledge Integration



Provide students with a comprehensive understanding of sustainability through interdisciplinary learning. Integrate concepts from various subjects such as science, social studies, economics, and ethics to help students grasp the interconnections between environmental, social, and economic issues.

- Critical Thinking

Promote critical thinking skills by encouraging students to analyze complex problems, question assumptions, and evaluate evidence related to sustainable development. This can be achieved through inquiry-based learning approaches and problem-solving activities.

- Systems Thinking

Teach students to view issues holistically by understanding the interconnectedness and interdependence of various elements within sustainable development. This approach helps students recognize the unintended consequences of their actions and analyze potential long-term impacts.

- Collaboration and Participatory Learning

Encourage collaborative learning by facilitating group projects, discussions, and debates. Involve students in community-based initiatives, where they can actively participate in finding solutions to real-world sustainability challenges.

- Values and Ethics

Foster a sense of responsibility and ethical behavior by discussing values and principles related to sustainable development. Encourage students to reflect on their own values, beliefs, and behaviors, and explore how they align with sustainable practices.

- Action-Oriented Learning

Empower students to take action toward sustainable development by providing opportunities for practical application. This can include hands-on projects, community outreach programs, and environmental conservation efforts.

- Global Perspective



Develop a global perspective by encouraging students to understand sustainable development issues at local, national, and international levels. Facilitate cross-cultural dialogue, exchange programs, and virtual collaborations to broaden students' understanding of diverse sustainable development contexts.

- Lifelong Learning

Develop a mindset of lifelong learning by helping students understand that sustainable development is an ongoing process. Encourage them to stay updated with current research, innovations and best practices, and inspire a commitment to continuous self-improvement.

By adopting these comprehensive approaches, managers could help foster competent individuals who are equipped with the necessary knowledge, skills, values, and attitudes to contribute towards a sustainable future. On the other hand, Barth, M., & al. (2011) show that knowing what to do and how to do it, how to be, live, and transform the world requires that students be drilled with programs that enable professionalism and promote sustainable lifestyles.

Therefore, managers and teachers have a great responsibility to make sustainable development a part of their students' lifestyle. For this reason, students need to become citizens with competency for sustainable development in order to create awareness and solve day-to-day issues of development (Ayşe C. A., & al., 2019).

Contrasting individual skills and individual sustainability competence shows that the term "individual's skill" is used to include both psychological skills and social skills but is less inclusive than lifelong skills. Competence is an advanced construction of personal qualities, the mastery of new ways of solving professional problems, and the development of new methods and techniques of professional thinking to overcome negative attitudes and the inhibitory influence of experience, by changing the ways in which the processes, operations, and activities are being done.

Developing students' competence in the university for sustainability skills implies developing the students in such a way that they obtain the ability to learn, unlearn, and relearn. Graduates with sustainability competence contribute their full productive potential to achieve economic, social, and environmental development.

As such, foundational skills such as literacy provide the critical framework for students' sustainability competence, like critical thinking, systems thinking, problem-solving, and socio-emotional skills. Helping students develop these competences makes them allies of



development. Furthermore, developing students' competency increases the percentage of skilled labor, which in turn increases productivity, and reduces poverty, leading to economic growth. Sen, therefore, redefined sustainable development as "development that promotes the capabilities of present people without compromising the capabilities of future generations" (Sen, 2000). Sen's 'capability-centered' approach to sustainable development aims to "integrate the idea of sustainability with the perspective of freedom so that we can see human beings not merely as creatures who have needs but also as people whose freedoms really matter." Schumacher (1999) argued in line with Sen, stating that "development does not start with goods; it starts with people and their education, organization, and disciplines. Without the three, all resources remain latent, untapped potential." Meanwhile, the World Summit on Sustainable Development convened in Johannesburg in 2002 widely recognized that education has a major role to play in the realization of the vision of sustainability and highlighted the relationship between economic well-being, cultural diversity, the earth, and its resources (UNESCO, 2007).

However, Barth, M., & al. (2007), analyzed the implications for both formal and informal learning settings of new ways to develop key competences within higher education, with regards to interdisciplinary learning and students' self-responsibility.

The authors argue that, to date, little attention has been given to the circumstances in which the process of developing key competences for sustainable development may take place.

Barth, M., & al., further suggest the consideration of the possibilities of formal and informal learning and their relationship to competence development within higher education, by carrying out an explorative, qualitative study based on focus groups designed using different groups from formal and informal learning settings.

The findings show that the development of key competences is based on both cognitive and non-cognitive dispositions and requires multiple contexts. Through combining formal and informal learning settings within higher education as part of a new learning culture, a variety of contexts can be provided, and competence development can be enhanced. While aspects of both formal and informal learning settings could be identified, the interdependence between them remains exclusive. According to the author, main aspects for acquiring competences that may be crucial in higher education settings include value (Barth, M., & al., 2007).

In the past decades, it has become clear that moving towards sustainability requires changes in the way of life of those living in developed countries. However, the present consumption and



production patterns in developing countries are aspired to by those of developed countries, which is generally recognized as unsustainable.

Since the publication of the Brundtland Report *Our Common Future* (WCED, 1987), several organizations have been involved in research looking for new strategies to provide long-term ability for nature and human beings to survive and prosper together, as well as to guide planning and policy-making for a transition to sustainable development.

Although the conceptual and operational content of the terms has been closely contested and redefined, all definitions are related to a set of core ideas, including “living within the limits,” “understanding the interconnections among environment, economy, and society,” and “permitting equitable distribution of resources and opportunities.” This will help students to:

- Raise awareness on environmental problems
- Gain knowledge and a basic understanding of the environment and associated problems
- Change attitudes, values and motivation to actively participate in environmental protection
- Acquire and develop skills to identify and solve environmental problems
- Encourage the participation of all social groups and stakeholders to solve environmental problems.

#### **2.2.6. Criteria for developing competence in education for sustainable development**

Research shows that there are fixed criteria for the sustainability framework to guide the development of interdisciplinary, key, core, and base competences. Galleli, B., & Muck, L. (2020) conducted a synthetic analysis of the different proposals, which led to the following criteria:

##### **Interdisciplinary criterion**

University teaching has to be oriented towards interdisciplinary ends. This means that the faculty has to be structured in such a way that researchers and professors come from different academic areas and provide diverse academic and cultural approaches to facilitate the development of interdisciplinary dialogue from the logic of their various disciplines.



### **Criteria for mainstreaming**

The content aimed at developing competences for sustainable development must be integrated into different academic areas and across the different subjects and must pass through the different levels of university management.

#### **Criterion for university, society and workplace**

A university degree has to meet the challenges raised by existing institutions in areas like preparing professionals to live up to the demands of their work and responsibilities.

#### **Criterion for complexity**

A complex reality demands an ability to deal with complex situations, to act after reflection, and make coherent and fair decisions through the principles of complex thinking.

#### **Criterion for scientific and ethical development**

This involves the ability to take on responsibilities that contribute to new knowledge, strategies, and attitudes towards the culture of sustainability.

#### **Criterion for policy formulation and guidance in education**

Since the learning processes are based on the achievement of competences, the achievement of key competences for sustainability requires a regulatory framework to justify the selection of skills to be developed.

#### **Criterion for socially oriented learning**

Learning for sustainable development must be linked to real-life situations.

#### **Global criterion for actions**

The contents in curriculum profiles under development must be based on global referents when dealing with local and contextual issues.

#### **Criterion of integrating formal and informal learning experiences**

The university is an environment that offers opportunities for informal learning through debates, dialogue, the promotion of voluntary activities, and the development of tacit styles of learning through the internalization of values.



**Table 2: Key concepts and themes of education for sustainable development**

Ecological sustainability	Social sustainability	Economic sustainability	Political sustainability
Biodiversity	Basic human needs	Cost-benefit analysis	Citizenship
Habitat	Cultural diversity	Economic development	Democracy
Carrying capacity	Cultural heritage	Eco-efficiency	Decision making
Conservation ecology	Human rights	Life-cycle analysis	Tolerance
Carbon Footprint	Intergenerational	Natural capital	Power
Ecology	equity	Natural resource	Respect
Eco space	Participation	accounting	Conflict resolution
Ecosystems	Peace	Steady state economy	
Interspecies equity	Risk management	Sustainable consumption	
Natural cycles and systems	Social justice	Sustainable production	
		Triple bottom line	

For years, the training of universities in sustainability has been neglected with regard to the industries. As an attempt to resolve this situation, many universities have employed newly qualified artisans and technicians from industries and turned them into lecturers. These individuals lack professional pedagogical training and technical practical experience, which compromises the quality of education.

This neglect has a long-term negative impact on students' learning outcomes. While some may argue against the need for curriculum evaluation, it is important to consider the potential consequences of neglecting this process. Without effective evaluation, colleges may contribute to offering outdated or irrelevant courses that do not align with the needs of the industry. This can result in graduates who lack the necessary skills and knowledge to succeed in their careers. To ensure that the program is in line with governmental demands for skills development, it is crucial to evaluate the curriculum of public universities for sustainability by effectively evaluating the curriculum. The university can identify areas where improvements are needed and make necessary updates to meet these demands from the industries.

According to Claim Dlouha, J., and Burandt, S. (2015), in order to make sure that industries are in line with governmental demands for skill development in sustainability, the curriculum of the universities has to be effectively evaluated in order to increase its quality.

While some may argue against the need for curriculum evaluation, without effective evaluation, universities may continue to offer outdated or irrelevant courses that do not align with the needs of the industry. This can result in graduates who lack the necessary skills and knowledge in sustainability to succeed in their careers.

By evaluating the curriculum and incorporating feedback from companies and industry experts, universities can ensure that their programs are up-to-date and relevant, ultimately



benefiting students. The following is how the author outlined the significance of the new curriculum:

The department must communicate with companies while creating these training programs in order to ascertain the needs of the economy and build a program that will address them. Unfortunately, despite the financial support given for the curriculum, it still falls short of the requirements set by those who oppose development.

According to UNESCO (2023), there is evidence showing that the increasing development of CESD can lead to poverty reduction, economic growth, health improvement, and reduction in environmental pollution. For example, when communities actively engage in sustainable development practices, they can create jobs, improve access to healthcare, and reduce pollution levels. By specifying the ways in which CESD contributes to these outcomes, the argument becomes clearer and more persuasive.

By eliminating inconsistencies within state universities, we can ensure that students receive a consistent and comprehensive education in sustainability. This is important because it equips them with the knowledge and skills necessary to tackle complex environmental issues and find innovative solutions. Without addressing these inconsistencies, students may receive fragmented or incomplete education, limiting their ability to contribute effectively to sustainable development. When higher education institutions prioritize sustainability, they do not only educate their current students but also inspire future generations.

According to Soini, K., & Dessein, J. (2016), instilling a culture of sustainability in an institution will create a ripple effect that extends beyond their campuses. Graduates who have been exposed to sustainable practices and values are more likely to prioritize environmental stewardship in their personal lives. This can lead to positive changes in their communities, workplaces, and society as a whole.

Universities are seen as vehicles for human development, and there is evidence showing that the increasing development of CESD reduces poverty, environmental pollution, and increases economic growth. If state universities provide a strategy for the implementation of sustainable development, it will help harmonize the tension between economic, social, and environmental development by integrating them into a single concept pursued by students' programs.

According to UNESCO's report in 2023, placing equity at the heart of educational policy plays a significant role in transforming future leaders and their professions. This shows



that state universities can efficiently prepare students for careers in sustainability by integrating sustainability principles into their curricula and instructional techniques. Through a comprehensive understanding of interdependent systems and relationships, it will enable them to combat climate change and contribute to sustainable development.

In the end, eliminating inconsistency within state universities and industries is crucial for raising the next generation of change-makers. By equipping students with the knowledge and skills to address sustainability challenges, they will be better prepared to tackle complex environmental issues and find innovative solutions.

The competence developed in them will empower them to make informed decisions and drive positive change in their communities and beyond. Ultimately, fostering a culture of sustainability within universities will create a ripple effect that extends far beyond the campus walls, inspiring future generations to prioritize environmental stewardship.

For it to be possible, Soini K., & Dessein, J. (2016), say that attention towards the integration of sustainable development principles that link competence to existing practice is needed because the concept of competence has become too elastic and blurred, due to mixed interpretation and expectation. Secondly, competences are integrated into existing programs in an inappropriate way due to individual competence, leading to the development of a mixed competence resulting from the new system and old system delivering a weak or wrong outcome. The old system focused on the examination of knowledge acquisition, rather than developing the holistic approach of competence in students, which is often criticized in the university due to the instrumental translation made by university policies and programs.

However, competence could have been defined in such a way that allows easy assessment of skill acquisition without omitting values and attitudes. Within the case of the University of Leuven, particular attention is given to providing general values in competences from programs. But analysis of different study programs points out that the practical integration of competence in education often focuses on instrumental skills rather than attitudes and values. According to Lambrechts, W. (2016), competence has a strong focus on complexity, attitudes, and values, and it is particularly hard to deal with in the current university context. In recent years, many sets and frameworks of key competences for sustainable development have been defined, but their integration is still fragmented and focused on instrumental skills rather than values and attitudes for sustainable development.

In addition, the integration of competence for sustainable development must be assessed within different settings and study programs by analyzing the competence schemes of



study programs and/or policies. Such analysis provides useful information about the status of integration of key competences in education for sustainable development in certain study programs. There is also a need to frame general competence within the concept of sustainable development because there are certain elements of sustainability within the competence scheme, for example, critical thinking, which is prominent without being explicitly linked to sustainable development.

The issue of fragmented integration of sustainable development in the university does not define the competences needed in different contexts nor provide a coherent approach. For example, interdisciplinary thinking is mentioned without referring to systems thinking in competences. This results in a situation where competences for sustainable development will not be appropriately addressed by the curriculum and will mainly be unofficial.

However, the acquisition and assessment of CESD require different ways of teaching and learning, which focus on experiential learning, reflective learning, participative learning, active learning, practice-based learning, and transdisciplinary approaches. These different ways of teaching and learning are necessary for universities to contribute to a more sustainable society. Wals opines that, at present, most of our universities are still leading the way to the kind of thinking, teaching, and research that accelerate unsustainability (Wals, 2010).

According to Wiek (2012), the university must assess the progress of learning to provide efficient teaching and methods to elaborate profiles that will allow students to carry out their professional activity in the future, thereby resolving the problems presented in their context. In addition, the type of competence trained in the university has a clear framework aiming to develop diverse and recognizable profiles in sustainable development.

Leal Filho & al. (2020) carried out a study on governance and sustainable development and stipulated that the problem of sustainable development is governance. However, integrating a proper framework for sustainable development will help improve unsustainable practices in the university. The author analyzes certain parameters of sustainable development such as sustainable development policies, certification, organizational structure, budget, reports, and teams for sustainability as challenging factors for the integration of sustainability in 120 universities in different contexts.

Forty-one percent of the universities were from Latin and North America, thirty-five percent from Europe, thirteen percent from Africa, and eleven percent from the Asia-Pacific. The result of the analysis showed that, even though there are different opinions and attitudes on the role of governance, sustainable development policies and strategy are regarded as



important components and/or factors of governance necessary for the integration of sustainable development in the university, even though there are different opinions and attitudes on the role of governance.

According to Angela B., & al. (2013), the problem of sustainable development in the French university is a problem of legitimacy. Analysis and comparison of the curriculum and program content with international standards for sustainable development in seventeen universities in France, America, and Britain shows that the evolution of sustainable development in their context is questionable. From the discussion, it shows that there is a tension between the subject content to teach and the intention for training with respect to practical considerations. In contrast with the Anglophone context, they focus more on projects and case studies as levers to engage students in analyzing and learning about real complex problems. The projects are readily seen as utilitarian approaches with economic goals, and the market becomes the determinant of the knowledge.

Furthermore, in the Anglo-Saxon context, programs are designed in such a way as to make use of the social, economic, environmental, and cultural dimensions of sustainable development. Thus, the issue of integrating sustainable development through interdisciplinary and multidisciplinary approaches has to be solved by the Anglo-Saxon model, while in the French context, it is an obstacle to implementing sustainable development principles through an interdisciplinary approach.

This is because the capacity to dialogue, transparency, and openness stem from divergent points of view and perspectives, even though at times the intention is good, it often leads to extended debates as discussed by the author. In addition, the issue of the type of key competence comes up regularly, and often creates the problem of teaching methods, the skills and knowledge to transmit, with ways to evaluate the existing programs.

According to Hidalgo A. L., & Fuentes J. M. (2013), for such a reason, it is necessary to choose a model of education that allows university students to be aware of the need to live in a different way and be aware of their absolute reliance on the natural environment. But, choosing the right model for training competence depends on their notion of sustainable development and the governance model used. Apart from due consideration to the role of governance as the basis for regulation, institutional actions, management, and decisions for sustainable development, the education model will result in injustice and social segregation.

According to the authors, additional officers, such as sustainability officers, should be added to the board of directors for good sustainability decisions. Again, it is necessary to opt



for a model of education that allows the university to instill in students the need to live in a different way.

All university students have the right to training in sustainability in order to have professionals who know how to deal with problems regarding unsustainability in every sector of society. Fortunately, there is evidence of more and more companies who consider both social and environmental ethics as criteria to recruit graduates. Therefore, to achieve a sustainable future requires integration of sustainable development principles for students to adopt different values, attitudes, and skills.

Universities must take the lead in the development of new forms of interdisciplinary and transdisciplinary education that is ethically oriented to propose solutions to solve problems related to sustainable development. Through the use of sustainable development principles, students' consciousness can be awakened, which will enable students to align their behavior with the principles of sustainability.

In essence, the curriculum must enable students to be aware of the values that should guide their future and their collaboration in order to tackle global challenges. In this sense, it is necessary to establish a framework to facilitate the engagement of the whole university community to develop institutional processes that contribute to sustainable development on a worldwide scale.

The university is not only a place for training. It is also a place where new educational proposals can be experimented with and a platform for spreading changes in perceptions, attitudes, and behavior toward new sustainable lifestyles. In short, it is necessary to design and implement a new educational model that deals with sustainability issues in the curriculum.

### **2.2.7. Case study of universities that develop students' Competency ESD**

Case studies and best practices from educational institutions around the world can provide valuable insights on how to develop students' competency in ESD. The University of British Columbia (UBC) in Vancouver, Canada, has a strong commitment to sustainability and is a leader in ESD. UBC offers various programs and initiatives to promote sustainability across the curriculum: UBC has an initiative to integrate sustainability into all disciplines. It does so by encouraging faculty members to incorporate sustainability concepts into their courses to ensure that every student develops a fundamental understanding of sustainable development.



**Sustainability courses:** UBC has a wide range of undergraduate and graduate sustainability courses across different faculties. These courses cover topics such as environmental science, sustainable business practices, and social sustainability.

**Campus sustainability:** UBC prioritizes sustainable practices on campus, including energy conservation, waste management, and sustainable transportation. The campus serves as a living laboratory for students to engage in hands-on sustainability projects.

UBC has successfully integrated ESD across its curriculum by using a framework that focuses on systems thinking, ethical decision-making, and sustainability leadership. It has implemented initiatives such as a green campus, waste reduction programs, and community partnerships to provide students with hands-on learning experiences.

Similarly, ABC University in Australia has adopted a multidisciplinary approach to ESD, where students from different faculties collaborate on sustainability projects. It has also established a sustainability office on campus to provide resources to support students and staff interested in sustainability initiatives (Martinez et al., 2022).

Another university that addresses sustainability is Lund University in Sweden. The university is renowned for its commitment to sustainability and offers several competency-building initiatives in education for sustainable development:

#### **Sustainability Science Master's Program:**

Lund University offers a unique interdisciplinary master's program in Sustainability Science that equips students with the knowledge and skills to address sustainability challenges. The program combines courses from various faculties and encourages students to work on real-world sustainability projects.

#### **Sustainability Forum:**

Lund University hosts an annual Sustainability Forum, bringing together academia, industry, and policymakers to discuss and collaborate on sustainability issues. The forum provides students with opportunities for networking, learning, and engaging in sustainability-related activities.



**Campus Sustainability Hub:**

Lund University has a dedicated sustainability hub on campus, providing resources, information, and support to students and staff. The hub organizes workshops, seminars, and sustainability-themed events to promote competence building and awareness.

Similarly, the University of Cape Town (UCT) in South Africa is committed to addressing sustainability challenges in Africa and offers several programs to train competency in education for sustainable development:

**Environmental and Geographical Science Department:**

UCT's Environmental and Geographical Science Department offers undergraduate and postgraduate programs that focus on sustainability and environmental issues. These programs emphasize practical skills development and prepare students to contribute to sustainable development in various sectors. They offer courses, workshops, and research opportunities to enhance competency in sustainable development.

**Sustainable Campus Initiative:**

UCT has implemented a Sustainable Campus Initiative that addresses sustainability in its operations, curriculum, and community engagement. The initiative encourages student involvement in sustainability projects and promotes a culture of sustainability on campus.

These case studies highlight the efforts of universities to develop competency in education for sustainable development. The University of British Columbia, Lund University, and the University of Cape Town are actively integrating sustainability principles into their curricula, promoting interdisciplinary approaches, and providing hands-on learning experiences. These initiatives equip students with the knowledge, skills, and mindset required to address global sustainability challenges, making them agents of change in their respective societies.



## 2.2.8. Other important forms of competence that can be associated to ESD

### 2.2.8.1. Core competencies for lifelong learning

Core competencies describe the essential knowledge and attitudes linked to each type of competence. These core competencies include:

- **Critical thinking, creative skills, the spirit of initiative and enterprise**

This type of competence is the foundation for the acquisition and appropriation of specific knowledge, methodologies, skills, and attitudes generally needed by those who create and innovate projects. It requires the appropriation of ethics and values, the identification of needs, and the definition of goals and objectives to resolve problems.

- **Effective communication**

It is the ability to express scientific and technological knowledge, information, and concepts in a clear, concise, and precise manner for easy understanding. This competence calls for the development of the learners' cognitive abilities. It also implies the effective and correct use of appropriate scientific interpretation and the communication of ideas, thoughts, sentiments, and facts, as well as opinions in an oral or written form. It presupposes the acquisition, mastery, and appropriation of effective listening, reading, writing, and motivational speaking skills.

- **Taking informed decisions, acting on them and tackling life problems in different contexts**

This is the ability to act on the strength of a set of information in a defined context to improve or solve a problem. It calls for the development of the learner's cognitive, affective, and psychomotor capacities. It presupposes the ability to think critically, inferentially, and creatively; to analyze, synthesize, and apply knowledge in seeking solutions to problems.

- **The scientific spirit and culture**

This is the faculty to observe phenomena, analyze problems, and formulate hypotheses to explain their possible occurrences, causes, and consequences. It involves experimentation from whose results the hypotheses can be upheld or refuted and from which conclusions are drawn. It calls for the development of the learner's cognitive and psychomotor capacities. Above all, this competence implies respect for ethical principles and the opinions of others.



- **Mathematical, technological and numeracy skills**

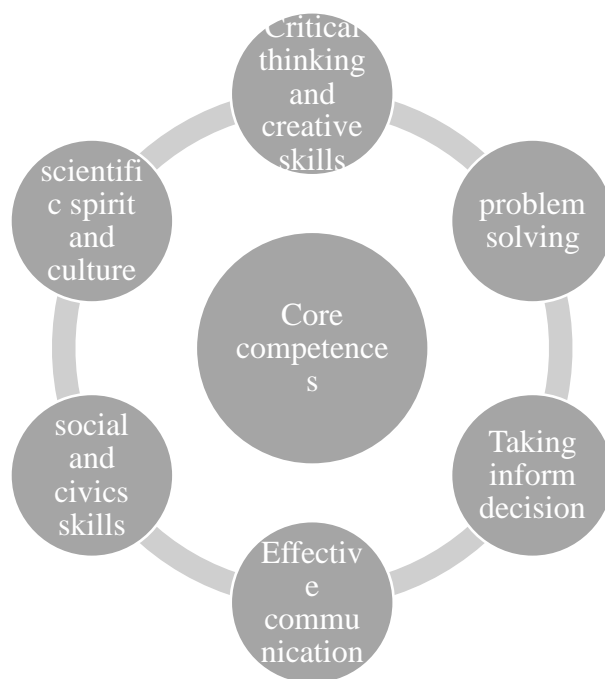
Mathematical and numeracy skills constitute a basic skill in science and technology. They are the aptitude to develop and apply mathematical and numeracy skills to seek solutions or improve a daily life problem or situation, with emphasis on logical, rational, and deductive reasoning, precision, and concision in activity. It presupposes changes linked to human activities, individual responsibilities as citizens, and accuracy and precision in the use of scientific and technological tools as well as information and communication technology (ICT).

- **Social and civic skills**

This is the ability to integrate oneself into a group based on one's needs and values. It calls for the development of the affective faculties of the students. It implies the acquisition of intercultural skills as well as the various forms of attitude that an individual adopts to contribute efficiently to socio-cultural life.

These core competencies are interdependent, and for each of them, emphasis is placed on critical thinking, creativity, initiative, innovation, problem-solving, risk analysis and evaluation, taking informed decisions, and the constructive management of sentiments and feelings.





*Summary of core competences in ESD Source, constructed by the research.2023*

### **2.3. Interdisciplinary competencies**

Interdisciplinary competence is a cross-cutting resource mobilized from several related learning domains. These competences are essentially transversal in nature. This is because each program that enables the development of students' skills in biology, geography, and mathematics contributes its own share to resolving complex life situations. For example, for students to be capable of preventing disasters in their professional lives, they will also require skills in geography and biology if they are being trained in social sciences and humanities per se. Thus, for them to resolve a problem of pollution, they need to make use of their transversal skills in biology, chemistry, and geography and even language for proper expression and communication.

#### **2.3.1. Methodological competences**

This competence includes strategies, techniques, and procedures designed to take action that promotes sustainability values. It involves participation in the elaboration of environmental projects for the local community as well as knowing how to transversely apply actions resulting from professional decisions affecting nature and the social environment.



*This section will consider the following basic skills*

- The ability to design action plans to improve on any process-product relationship from an environmental point of view
- The ability to interact in an interdisciplinary way when resolving environmental issues that are relate to the academic and professional world
- The ability to develop and apply indicators for environmental problems
- The ability to carry out and or collaborate in conducting environmental audits.

### **2.3.3 Ethical competences (knowing how to act and evaluate)**

The very definition of sustainable development involves moral and ethical conceptions which encourage new values that are coherent with sustainability; it implies the evolution of a new type of ethic that encompasses different spheres of human interaction in society. All these interactions lead to a new three-dimensional ethics:

- One which places individual right, the relation between human beings (first generational right)
- One where the value defines social rights, what affects the relationship between human beings (second-generation right)
- One which emphasizes environmental values, peace and the development of peoples (the third-generation rights).

This change in perspective affecting the ethical framework would imply that, through the syllabi of different subjects, actions could be taken to develop the ability to relate values through knowledge about the beliefs that underlie the relationship between people and their environment.

*Skills that is incorporated are:*

- The ability to recognize ethical models that drive decision making related to sustainable development
- The ability to recognize one's own beliefs, values and attitudes toward issues related to sustainability
- The ability for empathy, compassion, and solidarity within and between generations.



- The capacity to take a stand on environmental and ethical dilemmas and justify possible solutions
- The ability to develop personal ethics with respect to sustainability
- The ability to foresee the consequences of decisions to be taken and the ability to develop a sense of responsibility with respect to the consequences of one's own actions.

***In this section the competence that should be incorporated are:***

- Knowledge about the beliefs, values and attitude that underlie the relationships between people and their environment.
- The ability to recognize the models of environmental ethics that drive decision-making and the implementation of measures related to the environment.
- Building a personal environmental ethic based on sensitivity towards the natural and socio-cultural environment.
- The ability to recognize one's own beliefs, values and attitudes with respect to environmental issues. The acquisition of a sense of accountability for the consequence of one's own decisions and actions.

The change in approach involves new considerations based on sustainability, which enables the modification of traditional logical models that are based on the relationship between humans, the social, and the natural environment, where the repercussions of human actions on their environment are not ethically significant.

Hence, the inclusion of core competences contributing to sustainability cannot merely refer to cognitive and methodological aspects while ignoring ethical considerations. Incorporating sustainability in course profiles is a strategy that tends to facilitate the achievement of those educational objectives referring to the promotion of skills for sustainability in the university. This is possible due to the reformulation of the subject contents, which must be worked on through disciplinary dialogue and consideration of specific criteria based on ethics, equity, and multiculturalism to guide the progress of the whole process to promote sustainable development.



### 2.3.2. Research competence

Generally, the description of research competences is focus on instrumental research skills, but other components also have to be considered within the concept of research competences. Verburgh (2013) describes six research-related learning outcomes which could be address in a given educational profile:

- Results: Acquiring knowledge from results of research
- Underpinnings: Gaining insight into methodological and theoretical underpinnings of research
- Practical research skills: Developing particular practical research skills
- Critical thinking: Developing a critical attitude towards information, knowledge and knowledge construction
- Curiosity: Developing curiosity towards evolutions in the discipline.

Over recent years, considerable attention has been paid towards the relationship between research and teaching and the integration of research competences in the university (Verburgh et al., 2013). The importance of integrating research competences is stress, for bachelor and masters' programs. Literature points out that there is a lot of discussion about the definition and formulation of research competences. Different definitions and frameworks were use in order to analyses the integration of research competences. It is clear that integrating research competences can focus on different goals and learning outcomes, depending on the context of the university.

### 2.3.3. Competences for sustainability

According to UNESCO (2017), eight overarching competencies for sustainability are described. The eight sustainability competencies are:

- Systems thinking competency
- Anticipatory competency
- Normative competency
- Strategic competency
- Collaboration competency
- Critical thinking competency



- Self-awareness competency
- Integrated problem-solving competency.

The general attention toward competence is leading to extended debate about its practical implications when integrating sustainability competence or competence in education for sustainable development into existing study programs. Competence has become too elastic and too blurry, due to mixed interpretations and expectations. Secondly, competences are integrated in an inappropriate way into existing study programs, which often leads to weak or wrong outcomes. It focuses on the examination of knowledge acquisition, rather than developing a holistic approach to competences. Thirdly, competences are criticized because of the translation made by policymakers and lecturers: they define it in such a way that does not easily allow it to be assessed, often leading to skill mismatches while overemphasizing values that are hard to evaluate. In the case of Leuven, particular attention is focused on framing the competences within general values.

However, the analysis of different study programs has pointed out that the practical integration of the competences was often focused on instrumental skills rather than attitudes and values. Key competences for SD suffer from the same symptoms of being too elastic, too blurry, integrated inappropriately, and focused toward mere instrumental skills. In recent years, many sets of frameworks for key competences in ESD have emerged, but their integration is still too fragmented, implicit, or focused on instrumental skills, and the specific outcomes of these competences are hard to measure (Lambrechts et al., 2013). Also, in the case of Leuven, there seems to be a mismatch between the study programs' intentions and the practical situation, where the focus is on instrumental skills rather than integrative competences without any framing within the concept of ESD.

#### **2.3.4. Strategies to enhance students' competency in education for sustainable development**

One example of a successful strategy to enhance students' competency in education for sustainable development is the integration of sustainability across different faculties. For instance, a study by Thompson et al. (2020) found that incorporating sustainability topics into science, social studies, and language arts classes not only improved students' understanding of sustainability but also enhanced their critical thinking and problem-solving skills.



Another example is the use of project-based learning programs focused on environmental issues, where students work on real-world sustainability projects in collaboration with community partners. Research has shown that this approach not only increases students' engagement and motivation but also develops their teamwork, relationships, and communication skills (Jones et al., 2017)

#### **2.4. Theoretical Framework that support students' competency in education for sustainable development.**

This part of the work presents the models and theories that explain students' competency in education for sustainable development.

##### **2.4.1. The Triple Helix Model**

The university is viewed as a support structure for capacity building, that is, training students to be adept in knowledge and competence for sustainability industries. Recently, the university has increasingly become involved in competence-based training on the environmental, social, and economic dimensions of sustainable development.

Etzkowitz and Leydesdorff proposed the Triple Helix Model of University-Industry-Government for explaining structural development in a knowledge-based economy. Contrasting the knowledge-based economy with a political economy, the structure of society is continuously transformed by developments that originate from technoscience (Leydesdorff, 2011).

The Triple Helix thesis postulates that: “the interaction between University, Industry, and Government is the key to improving the conditions of a knowledge-based economy.”

In the Triple Helix, industry operates as the locus of production; government as the source of contractual relations that guarantee stable interactions and exchange; and the university as a source of new knowledge and as a creator, which is the generative principle of a knowledge-based economy. Clearly, the university stands as a primary institution in the Triple Helix relations, providing the adequate knowledge and technology needed through its academic training. This shows that knowledge-producing institutions have the capacity to recombine old ideas, synthesize and conceive new ones, but also to translate them for practical use.

The university, as a producer of scientific knowledge, has also been transformed into an economic enterprise; thus, the creation, dissemination, and utilization of knowledge has become more directly involved in industrial production and governance, thereby giving the university a new role to play in society (Etzkowitz, 2003).



The transformation of academia into a source of innovation is concomitant with the transformation of innovation from an internal process within individual firms to one that takes place between firms and knowledge-producing institutions. These knowledge-producing institutions therefore act as a source of innovation by supplying a human resource (individuals) with adequate innovative capacity through a defined curriculum.

Intellectual capital is becoming as important as financial capital as the basis of future economic growth (Etzkowitz, 2003). This is why, rather than being subordinated to either industry or government, the university is emerging as an influential actor and equal partner in a Triple Helix of University-Industry-Government relations.

This idea, which is also supported by the new neo-classical theories of economic growth, places increasing importance on human capital (innovative capacity) and productive knowledge (Lucas, 1988; Roma, 1989; Azariadis and Drazen, 1990; Mankiw et al., 1992, cited in Anrora and Fortuna, 2004). In particular, the spread of knowledge depends on the learning potential (innovative capacity) linked to the human capital stock. A large stock of human capital in a country facilitates the country's absorption of new products, new ideas, and discoveries (Nelson and Phelps, 1966).

### **Summary of Chapter Two**

Chapter II examines the concepts of students' competency for sustainable development. It brings out the concept of sustainable development, education for sustainable development, models of sustainable development, types of competency, dimensions, models, and forms of competency needed for sustainable development. This chapter further explores the various approaches proposed in the literature to develop students' competency and concludes with a single theory to support the study.



**PART TWO: METHODOLOGY, PRESENTATION OF  
RESULT, CONCLUSION AND RECOMMENDATION**



## **CHAPTER THREE: METHODOLOGY**



This chapter presents the following aspects of methodology, including the area of study, the research design, population, sample size and sampling techniques, research instrument, validity and reliability of the instruments, administration of the instruments, data analysis technique, and recapitulative tables.

### **3.1. Area of the study**

Yaounde remains the heart of the higher education system in Cameroon, with it being the site of several national universities and professional schools such as the Higher Teachers' Training College, the School of Engineering (commonly known as the Polytechnic), and the Faculty of Medicine and Biomedical Sciences (FMBS). The University of Yaounde 1 hosts and trains the largest portion of the nation's higher education population. Presently, Cameroon has 11 state universities under the supervision of MINESUP. These universities include the University of Yaounde 1, the University of Yaounde II, the University of Buea, the University of Ngaoundéré, the University of Dschang, the University of Douala, the University of Maroua, and the University of Bamenda, with the recent decree for the creation of the University of Ebolowa, Bertua, and Garoua.

#### **3.1.1. The University of Yaounde 1 (UYI)**

The University of Yaounde 1 is located in Yaounde, in the central region of Cameroon. The university is made up of three main campuses, with the major campus located in Ngoa-Ekelle and the others in the district of Municipal Lake and Nkolbison. It covers a total surface



area of 105.37 hectares, and it is a bilingual institution—that is, it uses English and French as its institutional languages. The Ngoa-Ekelle campus comprises three faculties:

- The Faculty of Arts, Humanities and Social Sciences (FALSH);
- The faculty of Science (FS)
- The faculty of Education (FSE)

Most of these faculties have been offering programs that are sustainable development–oriented and distributed across the various sections of the courses taught.

**Colleges of university of Yaounde 1 are: FMSB, ENS, ENSPY, ENSET, IUT**

### **3.1.2. Research Paradigm**

Creswell & Clark (2007) hold that a research design is the procedure for collecting, analyzing, interpreting, and reporting data in a study—the procedure, the methods applied to collect and analyze data, and how the data is going to answer the research question (Grey, 2014). This study adopts a research design that examines the individual, groups, institutions, methods, and materials to describe, compare, contrast, classify, analyze, and interpret the entities and events in the field (Cohen et al., 2007).

The quantitative approach is used because it enables the researcher to collect a large amount of information using a validated research instrument. Moreover, it enables the collection of data at a particular point in time to describe the nature of the existing phenomenon, and to identify standards against which these phenomena can be compared. It also provides a wide view of the population to describe or measure any generalized feature, while ensuring objectivity and the generalization of the findings. Additionally, the research design is used to diagnose the ‘why’ and ‘how’ of the study. This involves collecting data to determine the extent to which sustainable university governance affects students’ competency in education for sustainable development. In this light, the degree of effect is determined using regression. The more related the variables are, the more accurate the predictions are; based on their absolute value, the stronger the effects between sub-variables. We adopted this research design because we intended to analyze the effect of sustainability governance on students’ competency in education for sustainable development.



### 3.2. Population of the study

According to Munki (2021), population is the entire group of people, events, or things of interest that the researcher wishes to investigate. The population of this study is made up of the internal stakeholders of Cameroonian public universities. Internal stakeholders include staff, administrators, managers, and students. The eligibility criterion is being part of a state university. The population of students at the time of the research was twenty-six thousand.

#### 3.2.1. Target Population

The target population is the actual population to which the researcher would like to generalize the findings. The three faculties of the University of Yaounde 1 were chosen for this research. These faculties were selected because they are easily accessible and train students in one or more domains of sustainable development as projected by their courses.

**Table 2: Distribution of students at the different faculties and level of education in the University of Yaounde 1 at the time of data collection.**

Faculties	Discipline	Levels of Education			Total
		<i>Level 3</i>	<i>Master 1</i>	<i>Master 2</i>	
FALSH	<i>GEO</i>	<i>507</i>	<i>340</i>	<i>305</i>	<i>1152</i>
FSE	<i>MED</i>	<i>0</i>	<i>286</i>	<i>50</i>	<i>336</i>
	<i>EDS</i>	<i>0</i>	<i>50</i>	<i>30</i>	<i>80</i>
	<i>CEP</i>	<i>0</i>	<i>60</i>	<i>40</i>	<i>100</i>
	<i>CEV</i>	<i>0</i>	<i>50</i>	<i>25</i>	<i>75</i>
FS	<i>STU</i>	<i>126</i>	<i>30</i>	<i>20</i>	<i>176</i>
	<i>CHEM</i>	<i>159</i>	<i>50</i>	<i>25</i>	<i>234</i>
	<i>MATHS</i>	<i>100</i>	<i>25</i>	<i>20</i>	<i>145</i>
	<i>BIOS</i>	<i>242</i>	<i>80</i>	<i>50</i>	<i>372</i>
	<i>PHYS</i>	<i>201</i>	<i>21</i>	<i>19</i>	<i>241</i>
<i>TOTAL</i>		<i>1335</i>	<i>992</i>	<i>584</i>	<i>2575</i>

Source : Researchers' investigation 2020-2021

The table above shows the number of students present at the university who wrote the exams at the time of the research. From the table, it is evident that in Geography at the Faculty of Arts, Humanities, and Social Sciences there were 1152 students in levels three, four, and five at the time of the research. In the Faculty of Education, in the following series—



Management of Education (MED), Specialized Education (EDS), Conception and Evaluation of Educative Projects (CEP), and Curriculum and Evaluation of Education (CEV)—the number of students was about 591 for the three levels that we used. In series such as Earth Science (STU), Chemistry (CHEM), Mathematics (MATHS), Biology (BIOS), and Physics (PHYS), the number of students was about 1,168. These numbers, as provided in the table, were obtained directly by observation of students' published results. Thus, the total number on the exam list at the time of the research was 2575 students, which constitutes the population of the study.

### 3.2.2. Targeted values for participation

Since a sample should be representative of the population, a good sample size is one that represents about 10–20% of the population. In this case, we took 20%. FSE, with a population of 591, had a sample size of 118; FALSH, with a population of 1152, had a sample size of 230; and FS, with a population of 1168, had a sample size of 233. These values were obtained by multiplying each population value by 0.2 (20%). Since three levels were involved, we divided the sample size by three to obtain the sample size for each level (L3, MI, MII).

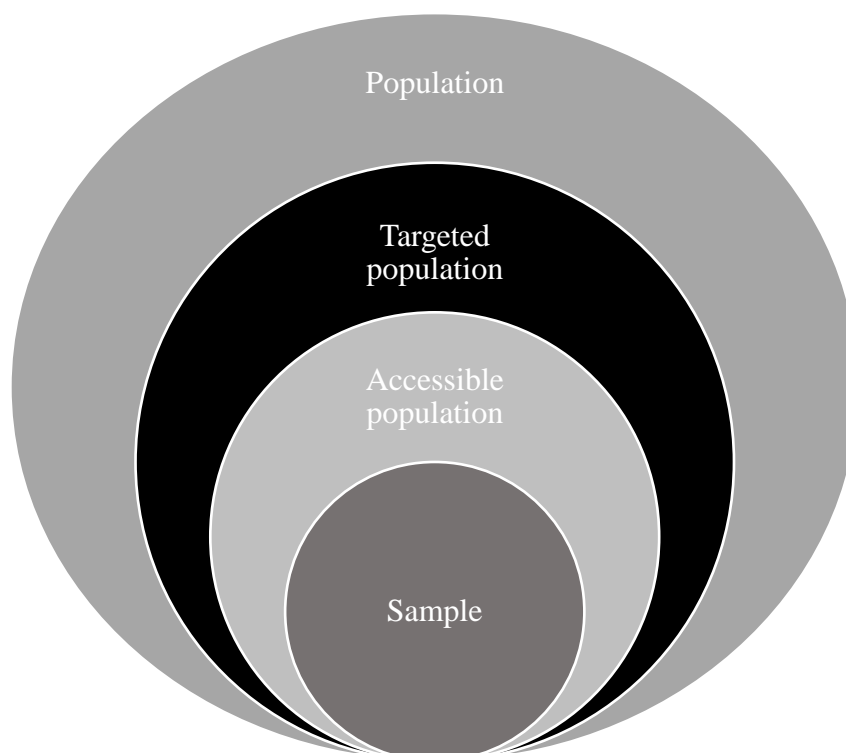
That is  $118 \div 3 = 39$  for FSE,  $230 \div 3 = 77$  for FALSH,  $233 \div 3 = 74$

Faculties	Levels of Education			Total
	<i>Level 3</i>	<i>Master 1</i>	<i>Master 2</i>	
FALSH	77	77	77	230
FSE	39	39	39	118
FS	74	74	74	233

### 3.2.3. Accessible Population

According to McLeod (2019), the accessible population is the total group of individuals from which the sample is drawn. It could be that portion of the population to which the researcher has reasonable access; it may be a subset of the target population. The accessible population of this study, therefore, consisted of students of the University of Yaounde 1.





**Figure 14: Accessible population**

### 3.2.4. Expected values of participation per discipline

Faculties	Discipline	Levels of Education			Total
		<i>Level 3</i>	<i>Master 1</i>	<i>Master 2</i>	
FALSH	<i>GEO</i>	<i>15</i>	<i>15</i>	<i>15</i>	<i>45</i>
FSE	<i>MED</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>15</i>
	<i>EDS</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>15</i>
	<i>CEP</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>15</i>
	<i>CEV</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>15</i>
FS	<i>STU</i>	<i>10</i>	<i>5</i>	<i>5</i>	<i>20</i>
	<i>CHEM</i>	<i>10</i>	<i>5</i>	<i>5</i>	<i>20</i>
	<i>MATHS</i>	<i>5</i>	<i>5</i>	<i>5</i>	<i>15</i>
	<i>BIOS</i>	<i>10</i>	<i>5</i>	<i>5</i>	<i>20</i>
	<i>PHYS</i>	<i>10</i>	<i>5</i>	<i>5</i>	<i>20</i>
<i>TOTAL</i>		<i>60</i>	<i>80</i>	<i>60</i>	<i>200</i>



### **3.3. Sample size and Techniques**

Sampling is a principle that specifies the conditions and process of selecting the members of the population to participate in the study. It is the process of extracting a portion of the population from which generalizations of phenomena can be made (Dudovsky, 2020).

#### **3.3.1. Sampling Techniques**

Sampling technique is the manner in which an appropriate sample size is selected for the study. We employed criterion sampling, most especially the stratified and simple random sampling techniques. This first technique is used when a distinctive group exists within a population—that is, in a heterogeneous population. The population is first divided into sub-groups or strata, and simple random sampling is carried out according to the proportion of each stratum in the entire population. Then, we further selected the number of students because it allows us to select any member of the population under study since all members met the same selection criteria. According to Cohen D. (2006), the criterion technique used in sampling helps the researcher first identify a criterion that is important to the research.

The researcher had to identify the participants who had the appropriate information and to study the cases that met that criterion. Participants were selected on the basis that they have knowledge and experience with the phenomenon of interest and, therefore, will be able to provide rich information. Usually, there is a large group of potential samples from which a sample is drawn that can provide information that is both in-depth and generalizable to a larger group.

#### **3.3.2. Stratified random sampling technique**

This sampling technique is used when distinctive groups exist in a population—that is, in a heterogeneous population. The university is segregated into faculties, and each faculty is divided into departments made up of different series and specialties. The university is first divided into sub-groups or strata, and simple random sampling is carried out within each stratum. Then, we selected from each stratum the various series used for the research. Random sampling was performed to obtain all the different disciplines from the various faculties and departments needed. Since a sample should relatively be representative of the population, a good sample size is one that represents about 10–20% of the population. In this case, we took 20%. For FSE, with a population of 591 for the selected level, the sample size was 118; for



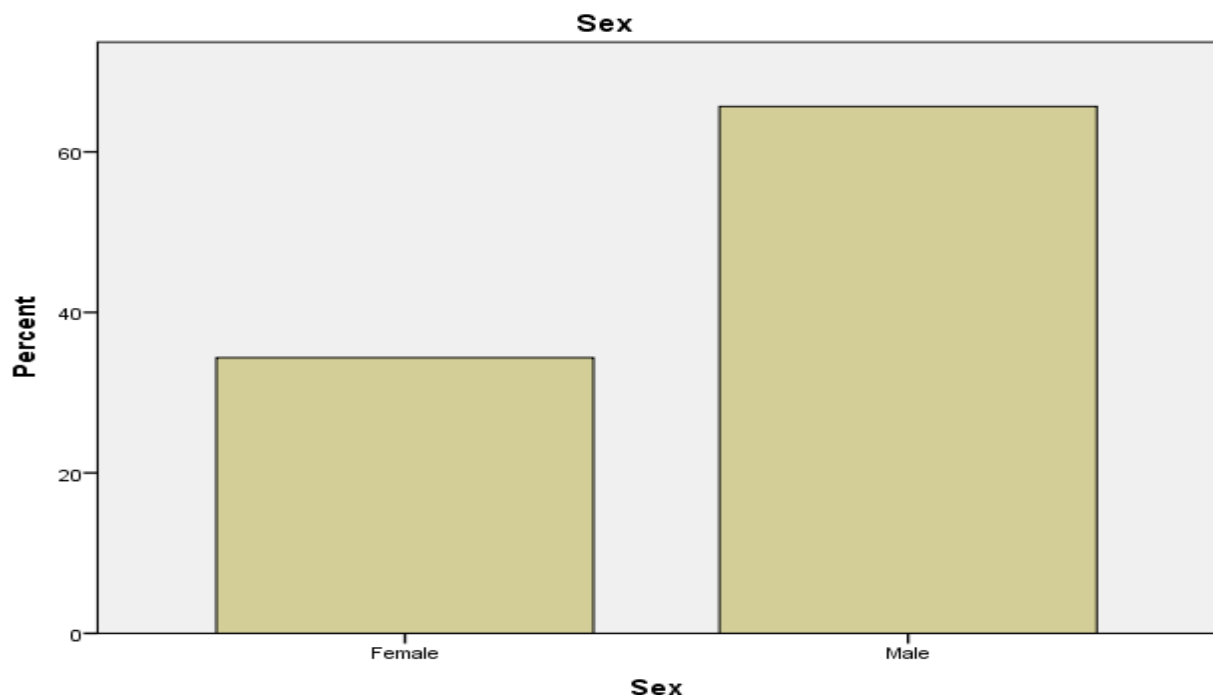
FALSH, with a population of 1152, the sample size was 230; and for FS, with a population of 1168, the sample size was 233. These values were obtained by multiplying each population value by 0.2 (20%). Since three levels were involved, we divided the sample size by three to obtain the sample size for each level (L3, MI, MII).

### 3.3.3. Sample

A sample is the group of people who took part in the investigation. The people who took part were referred to as “participants” (McLeod, 2019). A sample is a portion of the population that has been selected for the study and should be representative of the population. Therefore, for this study, we needed a sample of 200 participants from the University of Yaounde 1. However, we had a sample of 100 participants.

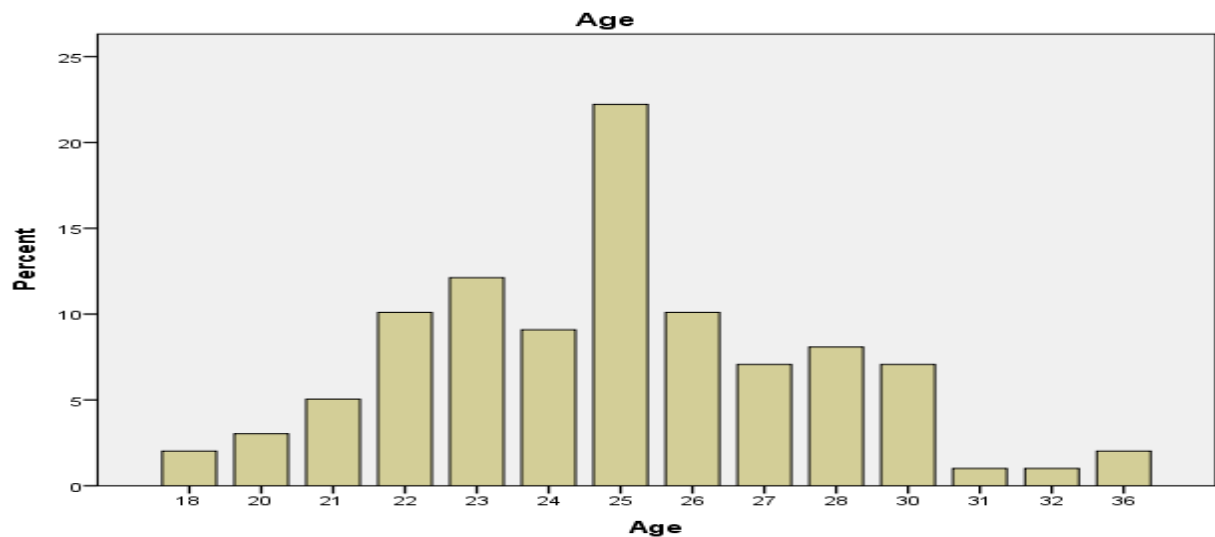
**Figure 3: Frequency distribution of sample participants according to sex**

The figure above shows the sex distribution of the participants in terms of frequency and percentage. It shows that 65 participants were male and 34 participants were female, giving a percentage of 34.3%.



**Figure 15: Frequency distribution of sample participants according to their Age**

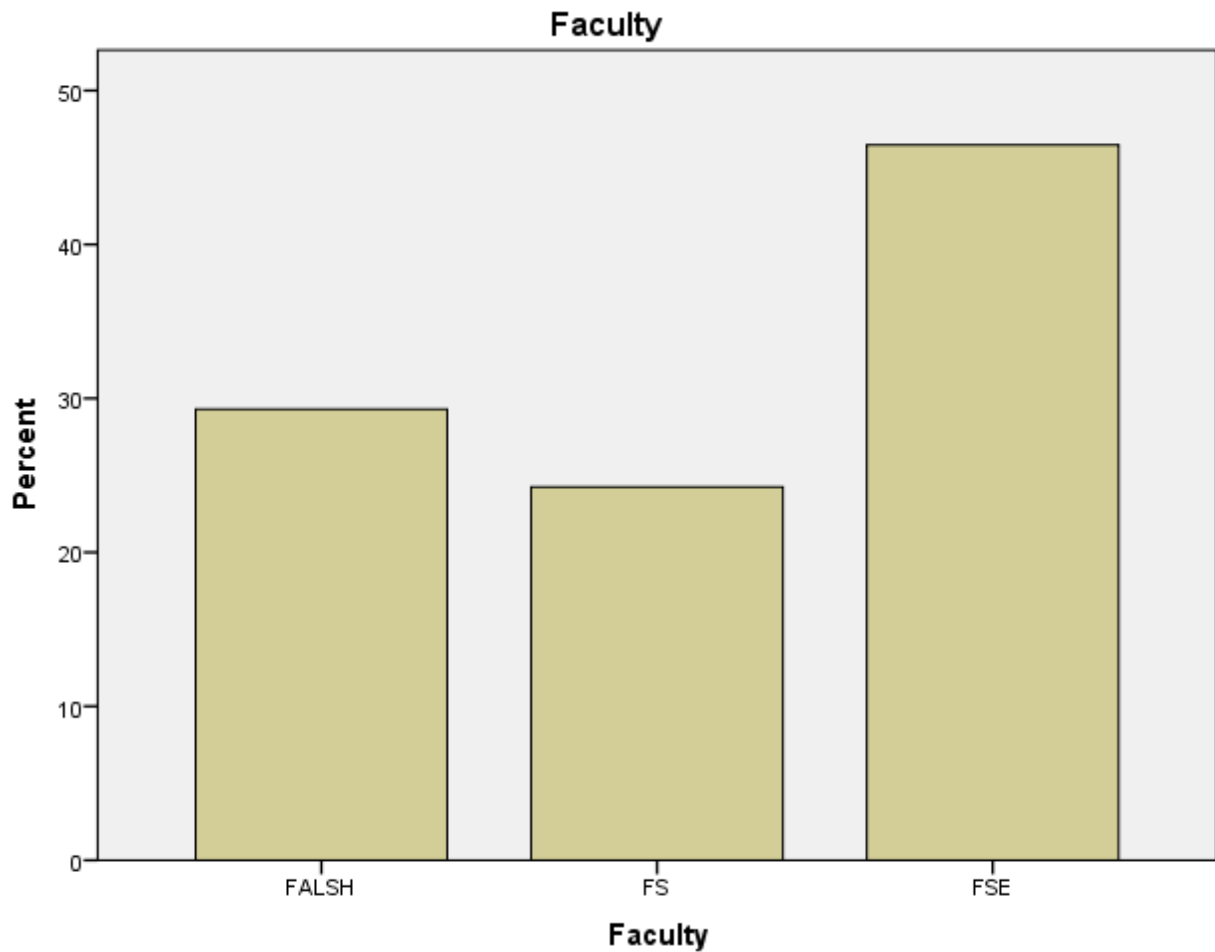




**Figure 4: show frequency distribution of sample participants according to their Faculties**

The figure above shows the frequency and percentage of participants according to their different faculties at the University of Yaounde 1. It shows that 46 participants from the Faculty of Education (FSE) make up 46.5%, whereas 29 participants from the Faculty of Arts, Letters, and Humanities (FALSH) make up 29.3%, and 24 participants, representing 24.2%, are from the Faculty of Science (FS).

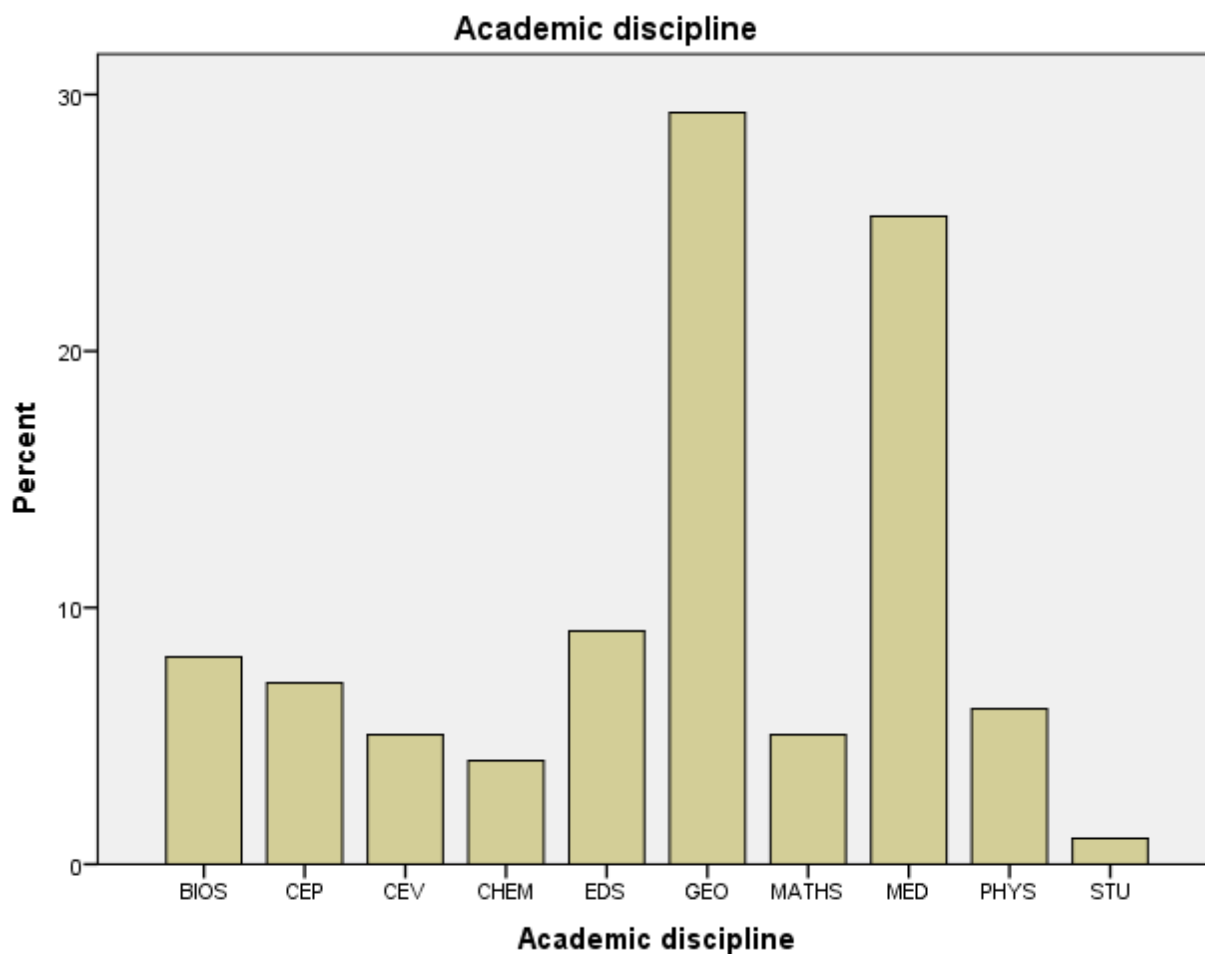




**Figure 5: Frequency distribution according to academic discipline**

The figure above shows the academic disciplines of the participants. The majority of the participants—about 29, making up 29.3%—are from the discipline GEO, which is under FALSH; whereas 25 participants (25.3%) are from the discipline called Management of Education, which is in the Faculty of Education (FSE). Nine participants were from a discipline called Specialized Education (EDS). Seven participants, representing 7.1%, are from a discipline called

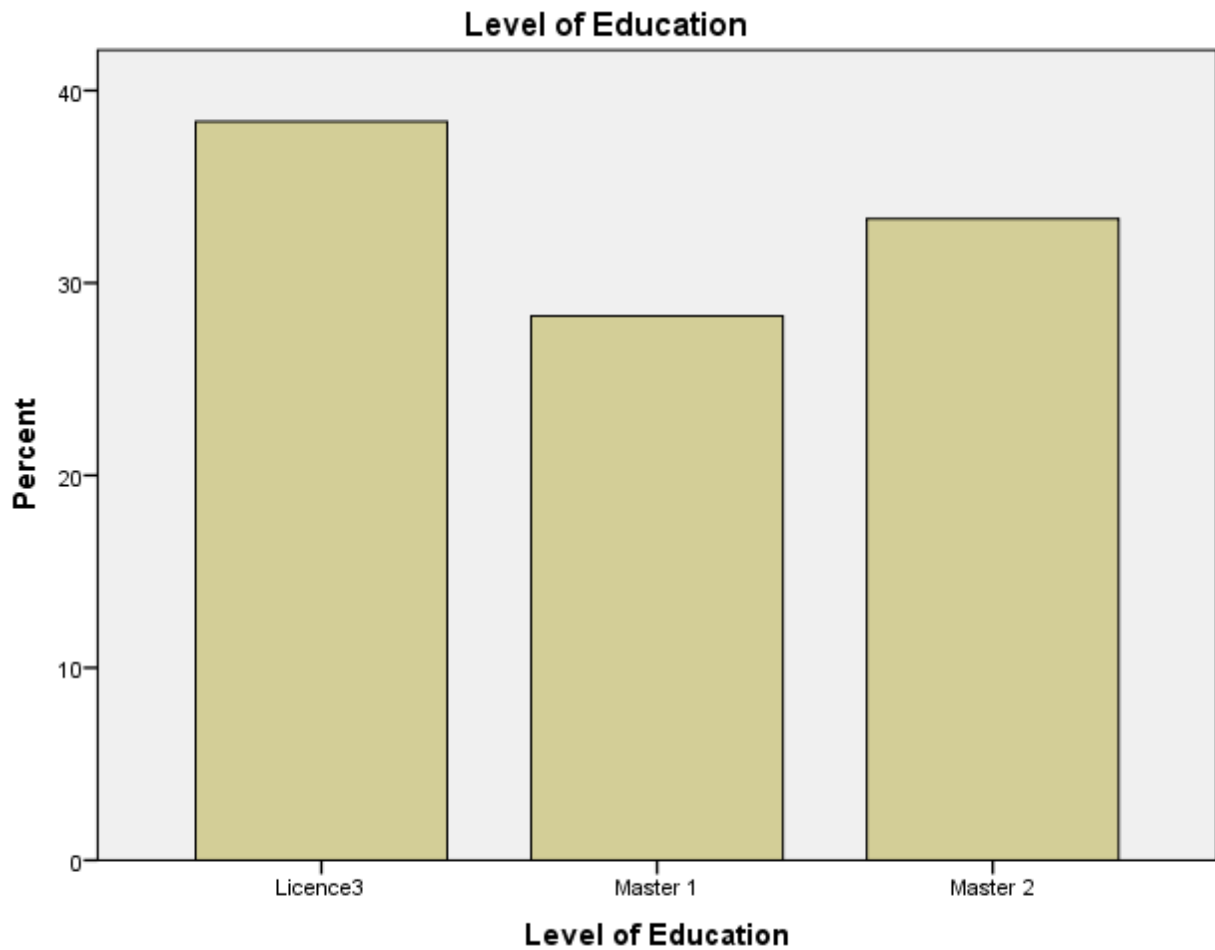




**Figure 6: Frequency distribution according to levels of education**

The figure above shows the distribution of the participants according to their respective academic levels in the different faculties of the university. The results indicate that 38 participants, making up 38.4%, are at the degree level (Licence 3); 33 participants, making up 33.3%, are at the Master 2 level; and the remaining 28 participants, making up 28.3%, are at the Master 1 level.

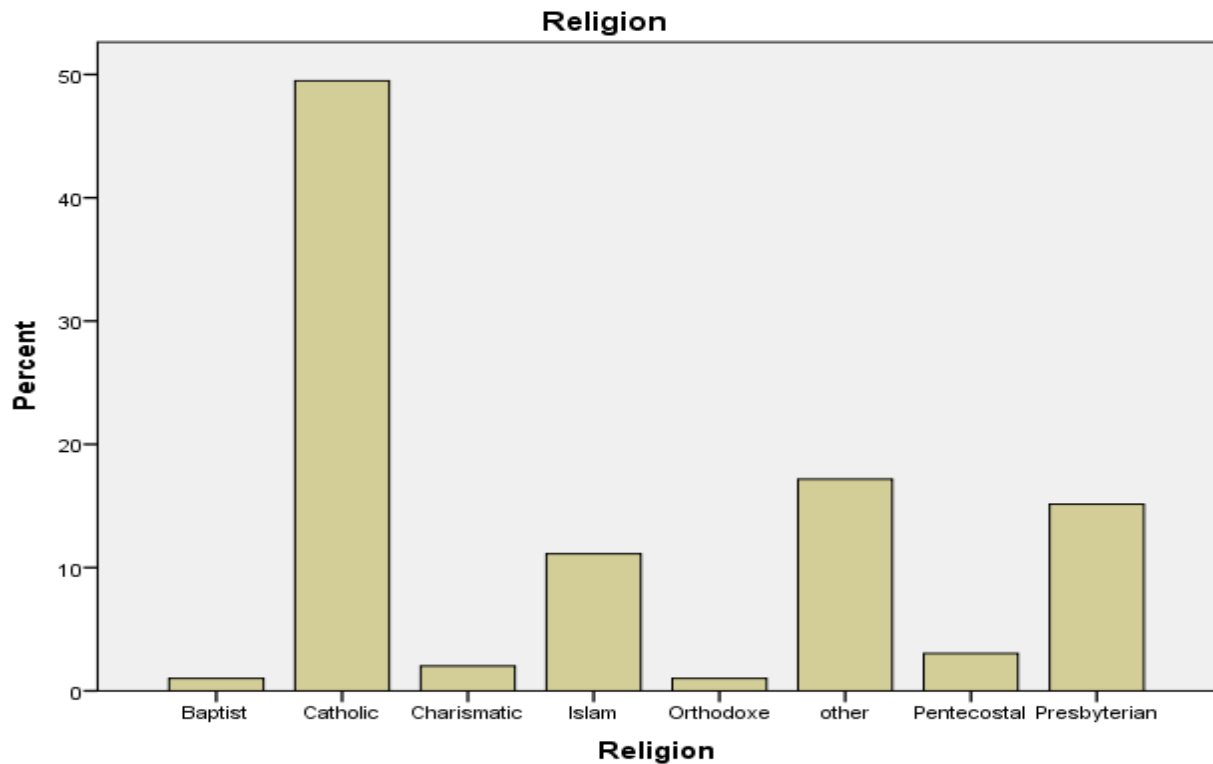




**Figure 7: Showing Frequency distribution according to Religion**

The figure above shows the religious affiliations of the participants. The results indicate that the majority of participants belong to the Catholic faith, followed by Presbyterian, Islam, and other religious groups, which are represented in smaller proportions.





### 3.7 Primary Data

Primary data refers to information that has never been published before. It is collected with a specific objective in mind and critically analyzed to answer research questions (Saunders et al., 2012). Primary data in this study was obtained through direct observation and questionnaire responses. The study employed a quantitative data collection method, which facilitated the analysis of diverse opinions.

### 3.8 Secondary Sources

Secondary sources derive from primary sources. According to Saunders et al. (2012), secondary data includes information previously published in journals, books, newspapers, online portals, and other media. In this study, secondary sources included books, internet resources, theses, YouTube videos, and reports.

### 3.4. Research Instruments

A research instrument is any tool used by a researcher to systematically collect data, such as a questionnaire, interview guide, focus group, or observation. For this study, a questionnaire was used to collect both qualitative and quantitative data.



### 3.4.1. The Questionnaire

A questionnaire is a research tool composed of structured questions designed to gather information from respondents. It was chosen for this study because it is cost-effective, time-efficient, and allows for the collection of precise and objective data from a large number of respondents.

The questionnaire was divided into two sections:

Section A: Personal and demographic information (e.g., gender, age, university, faculty, level, and religion).

Section B: Questions related to independent variables in sustainability governance, including university sustainability politics, culture, knowledge, practices, and management strategies. It also covered the dependent variable, students' competencies in education for sustainable development.

#### 3.4.1.1. Description of the Questionnaire

The questionnaire consisted of three sections:

**Section A (Q1-Q25):** Covers sustainable university governance with five sub-variables:

University sustainability politics (Q1-Q5)

University sustainability culture (Q6-Q10)

University sustainability practices (Q11-Q15)

University sustainability knowledge (Q16-Q20)

University sustainability management strategy (Q21-Q25)

**Section B (Q26-Q40):** Focuses on the dependent variable—competencies for sustainable development, divided into:

Knowledge (Q26-Q30)

Attitude (Q31-Q35)

Behavior (Q36-Q40)

#### 3.4.1.2. Weighing the Scale

A five-point Likert scale was used, categorized as follows:

Strongly Agree (SA) = 5

Agree (A) = 4

Strongly Disagree (SD) = 3

Disagree (D) = 2



Neutral (N) = 0

This scale was chosen due to its reliability in capturing opinions and facilitating statistical analysis using SPSS (version 23). Respondents were instructed to select the option most applicable to them.

### **3.5. Validation of the Research Instruments**

Validity is defined as a measure of truth or falsity of the instrument of data collection. It is classified into internal and external validity of the instruments. This is the most important measure to take to make sure the research instruments serve their intended purpose, as every instrument is design for a particular purpose. Once it is design appropriately, it measures rightly, and if it is faulty, it misses the target. Validity is an important requirement for both qualitative and quantitative studies (Cohen & al. 2007). To verify the extent to which the research instruments conceived for this study measures accurately the concepts, the two instruments are subjected to content validity.

#### **3.5.1. Face Validity**

**Face validity assesses whether a test appears to measure what it claims to measure. The questionnaire was reviewed by experts in education and geography to ensure its relevance and alignment with the study's objectives. It was then examined by the research supervisor and a sustainable development specialist to confirm its validity.**

#### **3.5.2. Content Validity**

According to Amin (2005), content validity is the degree to which the test measures what it is intended to measure. It shows how adequately the instrument measures knowledge, skills and attitudes of the respondents. Validity is therefore the degree to which a measurement actually reflects the variables it measures. In this study, the researcher design the instrument making sure that all the statements in the questionnaire fully exhaust all what was implied by the research questions and hypothesis.

### **3.6. Reliability of the Instrument**

The consistency of the results obtained with a research instrument determines its reliability. According to Asika (2012), a design research instrument should be concerned with how consistent the results obtained from the instrument are. It should be design to ensure that the instrument produces comparable, if not identical results if the study to which it was applied is repeated, even by a different researcher, under the same assumptions and conditions.



### 3.6.1. Test- retesting for absolute agreement

The test-retest method was used by the researcher to determine an instrument's reliability. According to Amin (2005), test-retest reliability is the degree to which the same individual's scores on the same test are consistent over time. This indicates that the results obtained at a given point will be the same or similar if the test is administered later. We distributed the questionnaire to students from three faculties in this study: education, management, and science. We re-administered the same questionnaire to the same population after a month, and the results were analyzed using SPSS to obtain a Cronbach's alpha of 0.88, which was compared to the standard Cronbach's alpha. To assess the reliability, or better yet, the absolute agreement, we use the standard Cronbach's alpha of 0.65, which is 65%. According to Salkind (2000), internal consistency investigates the dependability of a specific set of items.

#### Cronbach's alpha coefficient

$$\alpha = \frac{k}{k-1} \left( 1 - \frac{\sum \alpha_k^2}{\alpha^2} \right)$$
 Where  $\sum \alpha_k^2$  the sum of the variances of the k parts which are the items of the test or instrument.  $\alpha = \text{standard deviation}$

we are re-administering the questionnaires to the same group of people. The scores are to be computed to obtain a coefficient of reliability index.

Reliability statistics	
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
0.88	.656

### 3.6.2. Administration of the instruments

To administer the questionnaire, the researcher presented the research authorization to the various faculty managers. The researcher used both online and face-to-face techniques to collect data from students. The researcher started by distributing a physical questionnaire and realized that while the majority of the questionnaires were distributed to students, only a few had time to provide adequate responses. The researcher took note of this trend and decided to use an online technique, which permitted them to recover about 50% of the responses.



### **3.7. Ethical consideration**

Ethics refers to well-founded standards of right and wrong that prescribe what humans ought to do, usually in terms of rights, obligations, societal benefits, fairness, or specific virtues. These standards relate to rights such as the right to life, the right to be free from injury, and the right to privacy. Ethics are considered at four different stages of the research process: topic selection, data collection, analysis, interpretation, and thesis writing. For this study, we ensured that ethical standards were followed in the following areas: the research topic—all necessary precautions were considered to avoid selecting a topic that could harm or inconvenience both the university community and research participants.

### **3.8. Statistical Analysis Technique**

To achieve the research objectives, correctly answer the research questions, determine the validity of the conceptual model, and obtain the best results, it was critical to analyze the field data.

#### **3.8.1. The research method was used for the analysis**

We collected data for this study using a questionnaire, and the results were both qualitative and quantitative in nature, allowing us to use descriptive and inferential methods for interpreting the results. We chose a qualitative and quantitative study design because: first, the variables are categorical, and second, the data collected from various respondents were numerical. We also checked whether the dataset had the characteristics or followed the rules of a quantitative design. We noticed that the dataset displayed most of the required parameters. This provided us with the opportunity and ability to select an appropriate analytical tool and test for the study.

#### **3.8.2. Restatement of research questions, hypotheses and Objectives of the study.**

A hypothesis, according to Amin (2005), is a propositional statement or a reasonable guess based on available evidence that the research intends to test. It expresses the researcher's expectations regarding the relationships between the variables in the research problem. In summary, hypotheses provide answers to research questions. Thus, restating both the alternative and null hypotheses is important.



### 3.8.3. Restatement of Research Questions

How does sustainable university governance enhance students' competency in education for sustainable development at the University of Yaounde I?

### 3.8.4. Specific Research Questions.

- i. How does university sustainability politics enhance the students' competency in education for sustainable development in the university of Yaounde I.?
- ii. How does university sustainability culture enhance students' competency in education for sustainable development at the university of Yaounde I.?
- iii. How does university sustainability knowledge enhance students' competency in education for sustainable development at the university of Yaounde I.?
- iv. How does university sustainability practice enhance students' competency in education for sustainable development at the university of Yaounde I.?
- v. How does university sustainability management strategy enhance students' competency in education for sustainable development at the university of Yaounde I.?

### 3.8.5. Hypotheses of the study

#### 3.8.5.1. General Hypothesis

There exists a significant effect of sustainable university governance on students' competency in education for sustainable development in university of Yaounde I. (Ha)

There exist no significant effect of sustainable university governance on students' competency in education for sustainable development in the university of yaounde 1.(Ho)

#### 3.8.5.2. Specific Hypotheses

- (i) There exists a significant effect of university sustainability politics on students' competency in education for sustainable development in the university of yaounde 1
- (ii) There exists a significant effect of university sustainability culture on students' competency in education for sustainable development in the university of yaounde 1
- (iii) There exists a significant effect of university sustainability practice on students' competency in education for sustainable development in the university of yaounde 1



- (iv) There exists a significant effect of university knowledge on students' competency in education for sustainable development in the university of yaounde 1.
- (v) There exists a significant effect of university sustainability management strategy on students' competency in education for sustainable development at the university of Yaounde 1.

### **3.8.6. Restatement of the objectives of the study**

To analyze the effect of sustainable university governance on students' competency in education for sustainable development in the university of Yaounde I.

#### **3.8.6.1. Specific Objectives**

- (i) To analyze effect of university sustainability politic on students' competency in education for sustainable development in the university of Yaounde I.
- (ii) To analyze the effect of university sustainability culture on students' competency in education for sustainability development at the university of Yaounde I.
- (iii) To analyze the effect of university sustainability knowledge on students' competency in education for sustainable development at the university of Yaounde I.
- (iv) To analyze the effect university sustainability practice on students' competency in education for sustainable development at the university of Yaounde I.
- (v) To analyze the effect of university sustainability management strategy on students' competency in education for sustainable development at the university of Yaounde I.

### **3.9. Variables of the study**

Amin (2005) defines a variable as "anything that can assume different values." Variables are characteristics that can have multiple values and exhibit variation. We distinguish two major variables in this study: the independent variable (IV) and the dependent variable (DV).



### **3.9.1.Independent variable**

An independent variable is also known as the predictor or explanatory variable. It is the one that influences the dependent variable. It thus explains or accounts for variations in the dependent variable. The independent variable in this study is Sustainable University Governance.

#### **Dimension of sustainable university governance**

- **University sustainability politics**
- **University sustainability culture**
- **University sustainability practice**
- **University sustainability knowledge**
- **University sustainability management Strategy**

#### **Indicators:**

##### **University sustainability politics Filho L., & al., (2020)**

- Policy development for sustainable development
- Action plan
- Programs
- Sustainability officers

##### **University sustainability culture Claudy & al., (2016)**

- Environmental sustainability culture
- Social sustainability culture
- Economic sustainability culture
- Measurement of product progress
- Future importance of sustainability

##### **University sustainability practices Roxas & al.(2017)**

- Practice waste recycling
- Water and electricity conservation



- Training on environmental awareness
- Participation in environment program
- Environmental friendly supplier

#### **University sustainability knowledge Roxas & al., (2017)**

- knowledge of climate change
- knowledge of waste management
- knowledge of source of drinking water
- knowledge of source of electricity
- knowledge of environmental protection

#### **University sustainability management Strategy Filho L., & al., (2020)**

- Regular sustainability reporting
- Governance bodies
- Sustainability certification
- Sustainability program
- Interdisciplinary and transdisciplinary approach

#### **Independent Variable**

Hypothesis	Indicators	Numbers of items	Measuring Scale
RH1	USP	Q1-Q5	5points Likert scale
RH2	USC	Q6-Q10	5Points Likert scale
RH3	USPs	Q11-Q15	5Points Likert scale
	USK	Q16-Q20	5Points Likert scale
RH4	USMS	Q21-Q25	5Points Likert scale
RH5			



### 3.9.2. Dependent variable

According to UNESCO (2006), there are four types of thematic use in training competence for sustainable development. These thematic are centered on the following perspectives in pedagogy.

- o **Social dimension**
  - Human right
  - Peace and security
  - Gender equality
  - Comprehension of intercultural and cultural diversity
  - Health
- o **Environmental dimension**
  - Natural resources (water, energy, agriculture and biodiversity)
  - Climatic change
  - Rural development
  - Sustainable urbanization
  - Prevention and reduction of catastrophic
- o **Economic dimension**
  - Poverty reduction
  - Responsible enterprises
  - Market economic systems.



Table of variables and indicators

Variable	Dimension	Modality	Indicators	measuring Scale	Item N°
STUDENTS' COMPETENCE IN EDUCATION FOR SUSTAINABLE DEVELOPMENT (CESD)	Economic	Knowledge	-Market economy system -Poverty Reduction	5point Likert scale	Q26 Q28
		Attitude	-Employment -Responsible Enterprises	5point Likert scale	Q32 Q33
		behavior	-Reduce Poverty	5point Likert scale	Q37
	Environmental	Knowledge	-Biodiversity -Environment	5point Likert scale	Q29
		Attitude	-Conservation of natural resources	5point Likert scale	Q27
		Behavior	- Volunteerism -Reduction of catastrophic -Sustain urbanization	5point Likert scale	Q40 Q38 Q36
	Social	Knowledge	-Human Right	5point Likert scale	Q30,Q32
		Attitude	-Promote gender equality -Health and welfare -Peace and security	5point Likert Scale	Q34 Q35 Q31
		Behavior	-Participation	5point Likert scale	Q39



General Hypothesis	Specific Hypothesis	Variables		Modalities	Theories	Measurment scale	Statistical analysis	Questionnaire item			
		Independent (Iv)	Depended(v)								
There exist a significant effect of sustainable university governance on students' competence in education for sustainable development in the University of Yaounde I	There exists a significant effect of USP on students' CESD	Independent	Sustainable university governance(USG)	-University sustainability politics (USP)	System theory by Niklas Luhmann The theory of responsible management. Adsorptive capacity theory	Likert Scale	Regression analysis	5			
				-University sustainability culture (USC)				5			
				-University sustainability practice (USPs)				5			
				-University sustainability knowledge (USK)				5			
				-University sustainability management strategy (USMS)				5			
		Dependent	Students' Competency in education for sustainable development (CESD)	-Knowledge	5						
				-Attitude	5						
				-Behavior	5						
		There exist a significant effect of			University sustainability politics (USP)				Likert scale	Regression analysis	5



	USP on students' CESD							
	There exist a significant effect of USPs on students' CESD					<b>Likert scale</b>	<b>Regression analysis</b>	<b>5</b>
	There exist a significant effect of university sustainability knowledge on students' CESD					<b>Likert scale</b>	<b>Regression analysis</b>	<b>5</b>
	There exist a significant effect of university sustainability management strategy on students' CESD					<b>Likert scale</b>	<b>Regression analysis</b>	<b>5</b>



### **3.10. Conclusion**

Chapter III of this research work presents the methodological framework for the study. This chapter outlines the study area, the population of the study, the target population, the accessible population, the sampling technique, and the sample. It also discusses the reliability of the research instrument.

The research methodology adopted for this study was carefully designed by the researcher. Since it was necessary to compute data and transform it into numerical form to align with the research design and the context in which the researcher was working, a rational approach was taken.



**CHAPTER FOUR:  
DATA PRESENTATION, ANALYSIS AND DISCUSSION**



#### 4.1. Descriptive statistics and Presentation of findings.

This section presents the results of descriptive and inferential statistics. The tables below show the frequency distribution for the item-to-item analysis of the factors related to Sustainable University Governance. These factors include USP, USC, USPs, USK, and USMS.

##### 4.1.1. Presentation of the findings on university sustainability politics

**Table 8: Frequency distribution of item 1; The university has a sustainable development policy**

	Frequency	Percent
Strongly disagree	19	19.2
Disagree	10	10.1
Neutral	22	22.2
Agree	38	38.4
Strongly agree	10	10.1
Total	99	100.0

The frequency of participants who strongly agree, agree, disagree, or strongly disagree on the item that assesses whether the university has a sustainable development policy is shown in the table above. The table results indicate that 38.4% of the participants agreed that the university has a sustainable development policy, while 19.2% strongly disagreed. The total percentage shows that 45.5% accepted this fact, while 55.5% disagreed. Therefore, the governance system in place must develop policies addressing specific issues by utilizing sustainable development goals. These policies, which are necessary for faculties at the departmental level to improve action plans and programs, will help define the profiles and specific areas of students' skills to be enhanced.



**Table 9: Representation of Item 2; The university has a sustainable development action plan**

	Frequency	Percent
Strongly disagree	5	5.1
Disagree	20	20.2
Neutral	26	26.3
Agree	29	29.3
Strongly agree	19	19.2
Total	99	100.0

The table above assesses whether the university has a plan of action for sustainable development. Twenty-nine participants agreed that the university has a sustainable development action plan, twenty-six were undecided, and twenty agreed that the university does not have a sustainable development action plan. These numbers correspond to 29.3%, 26.3%, and 20.2%, respectively. The total percentage indicates 48.5% agreement and 51.5% disagreement on whether the university has a sustainable development action plan.

However, to effectively implement a sustainable development action plan within programs, it is necessary to juxtapose and collect superordinate factors that enable a cascade of actions driving sustainable development activities within programs. Without the interest of superordinates, there will be no proper definition of activities and actions to enhance students' competencies at the departmental level. As a result, a limitation in students' skills will be observed, which might negatively affect their competence.

**Table 10: Representation of item 3; The University has a sustainable development program**

	Frequency	Percent
Strongly disagree	9	9.1
Disagree	19	19.2
Neutral	29	29.3
Agree	24	24.2
Strongly agree	18	18.2
Total	99	100.0

The frequency of participants who responded to Item 3, which states that the university has a sustainable development program, is shown in the table above. The results show that 29



respondents were neutral on the item, representing 29.3%, while 24 respondents agreed with the statement, accounting for 24.4%. Meanwhile, 19 respondents believed that the university does not have a sustainable development program.

**Table 11: Representation of item 4; the university has sustainability officer**

	Frequency	Percent
Strongly disagree	7	7.1
Disagree	22	22.2
Neutral	25	25.3
Agree	32	32.3
Strongly agree	13	13.1
Total	99	100.0

The number of respondents who agreed with Item 4 is shown in the table above. The results show a 32.3% agreement from 32 respondents that the university has a sustainability officer to address sustainability issues. Meanwhile, 25 respondents were undecided, and 22 disagreed, representing 25.3% and 22.2%, respectively.

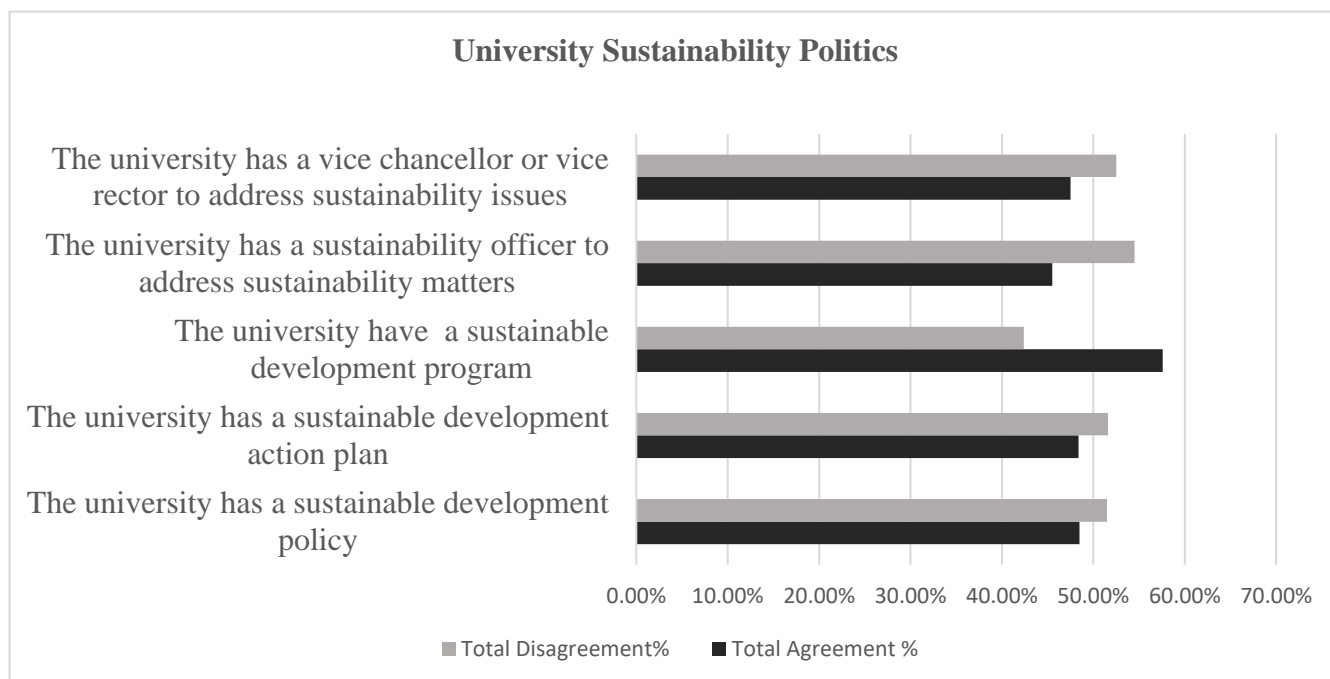
**Table 12: Shows item 5; the university has a vice chancellor or vice rector to address sustainability issues**

	Frequency	Percent
Strongly disagree	8	8.1
Disagree	22	22.2
Neutral	22	22.2
Agree	35	35.4
Strongly agree	12	12.1
Total	99	100.0

The table above shows the frequency distribution of respondents who provided responses to Item 5. According to the table, 35 respondents strongly agreed with the statement, accounting



for 35.4% of the total, while 22 respondents were undecided, and 22 disagreed that the university has a vice-chancellor or rector responsible for addressing sustainability issues.



**Figure 17: university sustainability politics**

The table above shows the frequency distribution of respondents who provided responses to Item 5. According to the table, 35 respondents strongly agreed with the statement, accounting for 35.4% of the total, while 22 respondents were undecided, and 22 disagreed that the university has a vice-chancellor or rector responsible for addressing sustainability issues.

#### 4.1.2. Presentation of the findings for the factor or sub-variable: university sustainability culture

**Table 13: Represent item 6: the university strive for an environmental sustainability culture**

	Frequency	Percent
Strongly disagree	7	7.1
Disagree	14	14.1
Neutral	17	17.2
Agree	51	51.5
Strongly agree	10	10.1
Total	99	100.0



The frequency of respondents who provided responses for item 6 is shown in the table above. According to the table of results, 51.5% of respondents believe that the university strives for an environmental sustainability culture. However, 17 respondents were undecided, and 14 respondents disagreed, accounting for 17.2% and 14.1%, respectively.

**Table 14: Represents item 7: the university strive for societal sustainability (peace, equality, equity, human right)**

	Frequency	Percent
Strongly disagree	10	10.1
Disagree	7	7.1
Neutral	15	15.2
Agree	51	51.5
Strongly agree	16	16.2
Total	99	100.0

The table above shows the frequency of respondents who responded to item 7. According to the results of the table, 51 respondents agreed with the item, accounting for 51.5% of the total, which shows that the university strives for societal sustainability. Sixteen respondents strongly agreed, while ten disagreed that the university strives for societal sustainability.

**Table 15: Representation of item 8: The university strive for economy sustainability (criteria for new product development)**

	Frequency	Percent
Strongly disagree	9	9.1
Disagree	27	27.3
Neutral	25	25.3
Agree	32	32.3
Strongly agree	6	6.1
Total	99	100.0

The table above shows the number of respondents who responded to item 8, which states that the university strives for economic sustainability. Thirty-two respondents agreed with the item, giving a percentage of 32.3%; twenty-five respondents were undecided; and twenty-seven respondents disagreed that the university strives for economic sustainability.



**Table 16: Representation of item 9, the university measure new product progress on sustainability**

	Frequency	Percent
Strongly disagree	12	12.1
Disagree	20	20.2
Neutral	24	24.2
Agree	35	35.4
Strongly agree	8	8.1
Total	99	100.0

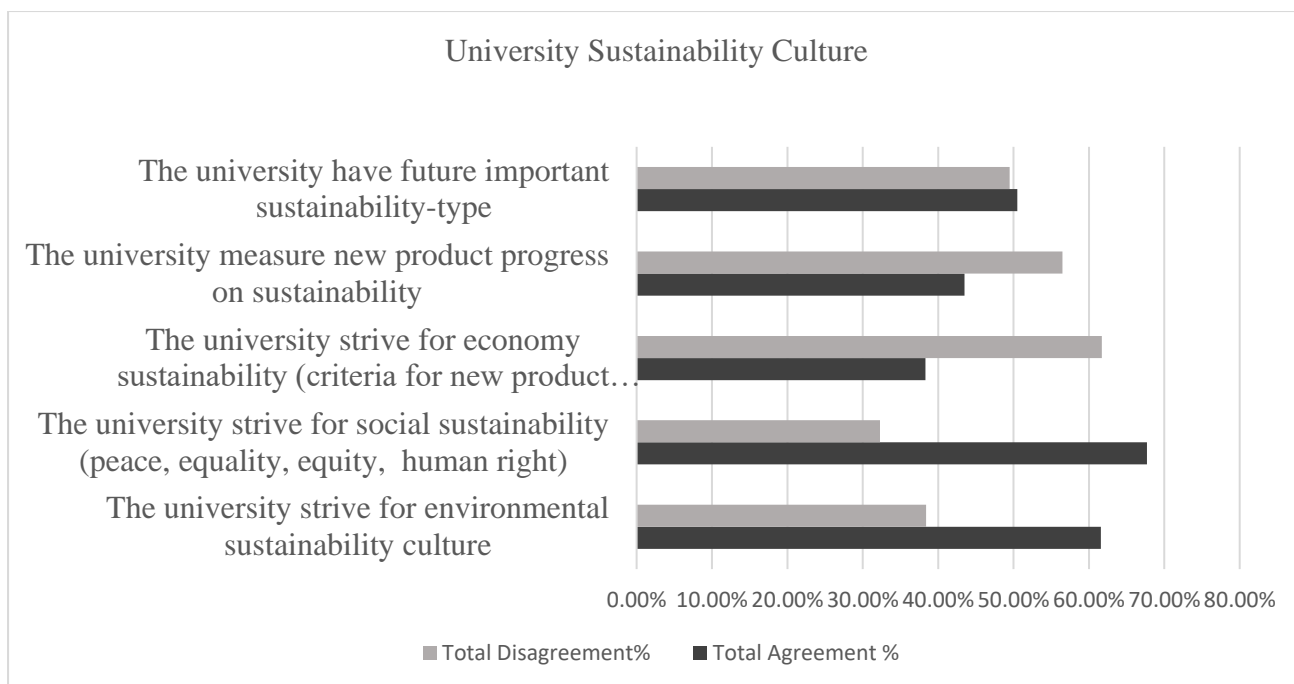
The table above shows the frequency of respondents who provided responses for item 9, which seeks to evaluate whether the university measures new product progress on sustainability. Thirty-five respondents agreed, twenty-four were undecided, and twenty disagreed, for percentages of 35.4%, 24.2%, and 20.2%, respectively.

**Table 17: Represent item 10; the university have future important sustainability-type**

	Frequency	Percent
Strongly disagree	10	10.1
Disagree	22	22.2
Neutral	17	17.2
Agree	33	33.3
Strongly agree	17	17.2
Total	99	100.0

The result in the table shows that thirty-three respondents believe that the university has important sustainability goals for the future, while twenty-two believe that the university does not have important sustainability goals for the future. This accounts for 33.3% and 22.2% of the result, respectively.





**Figure 18; university sustainability culture**

Overall, the majority agreed that the university strives for environmental and social sustainability culture and has important sustainability goals, but disagreed on the fact that the university strives for economic sustainability and also does not measure new product progress (innovative) in sustainability.

#### 4.1.3. Presentation of findings for the sub-variable university sustainability practice

**Table 18: Representation item 11: The university practice recycling of waste**

	Frequency	Percent
Strongly disagree	24	24.2
Disagree	19	19.2
Neutral	19	19.2
Agree	33	33.3
Strongly agree	4	4.0
Total	99	100.0

The table above displays the frequency and percentage of responses provided by respondents on item 11, which seeks to assess whether the university recycles waste. The result shows that, 33 respondents agreed that the university recycles waste, while 24 strongly



disagreed that the university recycles waste. This gave 33.3% and 24.2% respectively as maximum and minimum response for the item.

**Table 19: Representation of item 12: The university practice water and electricity conservation**

	Frequency	Percent
Strongly disagree	16	16.2
Disagree	17	17.2
Neutral	15	15.2
Agree	33	33.3
Strongly agree	18	18.2
Total	99	100.0

The result of the table above shows that 33 respondents agreed that the university practices water and electricity conservation, while 18 strongly agreed and 17 disagreed. This is seen in their respective percentages of 33.3%, 18.2%, and 17.2%, respectively.

**Table 20: Representation of item 9, the university give training on environmental awareness**

	Frequency	Percent
Strongly disagree	11	11.1
Disagree	12	12.1
Neutral	15	15.2
Agree	34	34.3
Strongly agree	27	27.3
Total	99	100.0

The table above shows the frequency and percentages of respondents who provided responses for item 13, the result shows that, 34 agrees and 27 also strongly agree that the university give training on environmental awareness whereas 15 were indecisive and 12 disagree. This is shown on their respective percentages with 34.4% for agree, 27.3% for strongly agree, and 15.2% for indecisiveness.



**Table 21: Representation of item 14: The university participate in environmental programs**

	Frequency	Percent
Strongly disagree	5	5.1
Disagree	15	15.2
Neutral	23	23.2
Agree	39	39.4
Strongly agree	17	17.2
Total	99	100.0

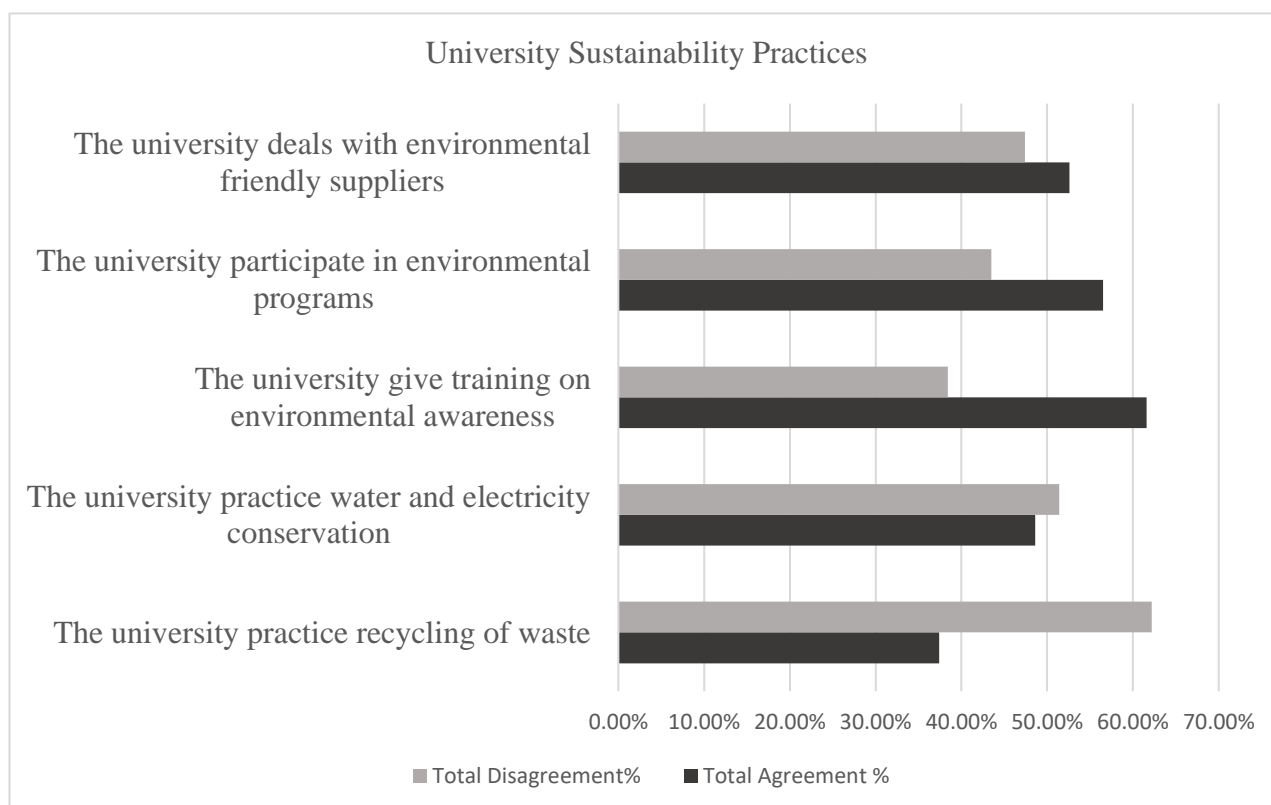
The table above represent the number of respondents who provided responses for item 14, the result on the table shows that, 39 agree giving a percentage of 39.4%, 23 respondents were indecisive with a percentage of 23.2% whereas 15 respondents with a percentage of 15.2% disagree that the university participate in environmental programs.

**Table 22: Representation 15: The university deals with environmental friendly suppliers**

	Frequency	Percent
Strongly disagree	12	12.1
Disagree	11	11.1
Neutral	24	24.2
Agree	31	31.3
Strongly agree	21	21.2
Total	99	100.0

The table above shows the frequency and percentages of respondents who provided responses on item 15. The result on the table shows that, 31 respondents agree and 21 strongly agree whereas 24 respondents were indecisive and 12 strongly disagree that the university deals with environmentally friendly suppliers.





**Figure 19: university sustainability practice**

Overall, majority agreed that the university create environmental awareness through environmental programs and deals with environmental friendly supplier however, disagreed that the university practice recycling of waste, water and electrical conservation.

#### 4.1.4. Presentation of findings for the sub-variable university sustainability knowledge

**Table 23: Representation of item 16: The university is knowledgeable about climate change**

	Frequency	Percent
Strongly disagree	7	7.1
Disagree	17	17.2
Neutral	14	14.1
Agree	44	44.4
Strongly agree	17	17.2
Total	99	100.0



The table above shows the frequency and percentages of respondents who provided responses for item 16. The result on the table shows that, 44 respondents agrees giving a percentage of 44.4% and 17 strongly agreed to the item giving a percentage of 17.2% whereas 17 respondents disagrees giving a percentage of 17.2% and 14 respondents were indecisive about the item.

**Table 24: Representation 17: The university is knowledgeable about waste management issues in the city**

	Frequency	Percent
Strongly disagree	7	7.1
Disagree	13	13.1
Neutral	18	18.2
Agree	45	45.5
Strongly agree	16	16.2
Total	99	100.0

The table above shows the frequency and percentages of respondents who provided responses for item 17, which state that; the university is knowledgeable about waste management issues in the city. 45 respondents agreed giving a percentage of 45.5% and 16 respondents strongly agreed giving a percentage of 16.2% whereas 18 respondents were indecisive on the item, 13 respondents disagreed giving a percentage of 13.1%.

**Table 25: Representation of item 18: The university is knowledgeable about issues concerning source of drinking water**

	Frequency	Percent
Strongly disagree	8	8.1
Disagree	12	12.1
Neutral	20	20.2
Agree	49	49.5
Strongly agree	10	10.1
Total	99	100.0

The table above shows the frequency and percentage of respondents who provided responses for item 18, which state that; the university is knowledgeable about issues concerning good source of drinking water. 49 respondents agreed to the item giving a percentage of 49.5%



whereas 20 respondents were indecisive about item giving a percentage 20.2% and 12 respondent disagrees to the item.

**Table 26: Representation of item 19: The university is knowledgeable about issues concerning source of electricity**

	Frequency	Percent
Strongly disagree	9	9.1
Disagree	10	10.1
Neutral	18	18.2
Agree	44	44.4
Strongly agree	18	18.2
Total	99	100.0

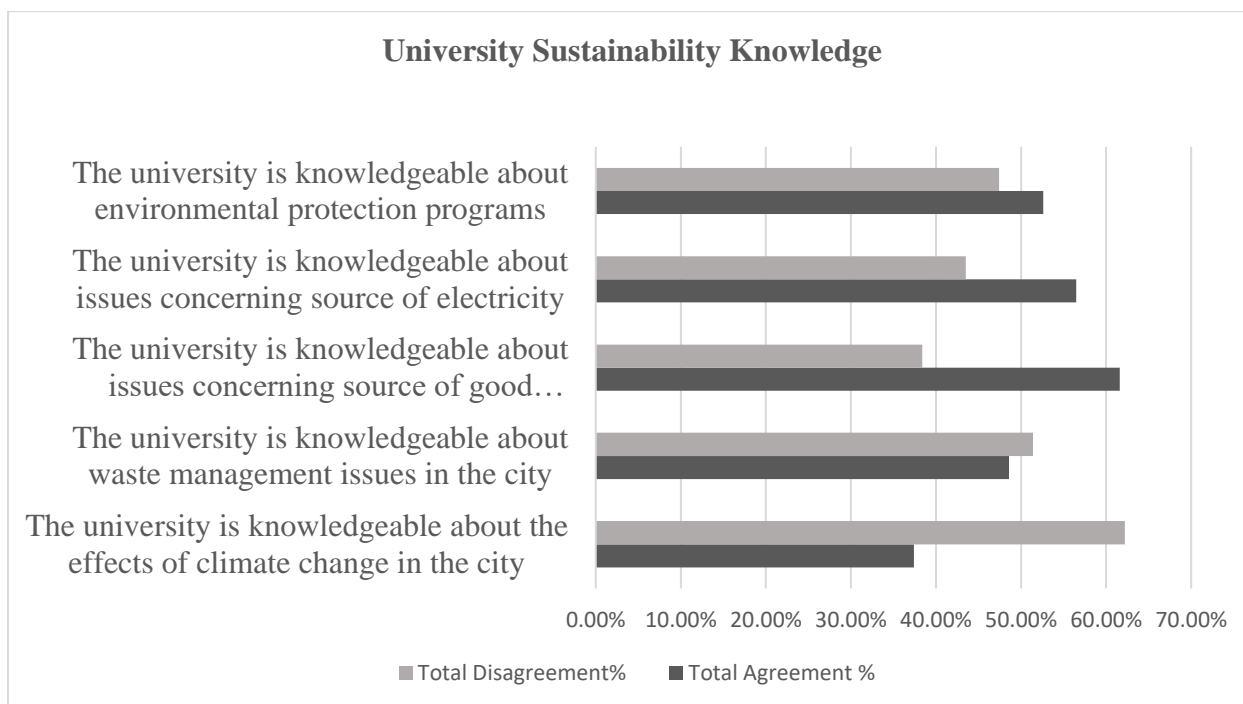
The table above shows the frequency and percentage of respondents who provided responses for item 19. 44 respondents agreed to the item, giving a percentage of 44.4%, and 18 respondents strongly agree giving a percentage 18.2% whereas 18 respondents were indecisive and 10 respondents disagree giving a percentage of 18.2% and 10.1% respectively.

**Table 27: Representation of item 20; The university is knowledgeable about environmental protection programs**

	Frequency	Percent
Strongly disagree	11	11.1
Disagree	7	7.1
Neutral	9	9.1
Agree	47	47.5
Strongly agree	25	25.3
Total	99	100.0

The table above shows the frequency and percentage of respondents, who provided responses for item 20, 47 respondent agree that the university is knowledgeable about environmental protection programs giving a percentage of 47.5%. 25 strongly agree giving a percentage of 25.3% whereas 11 strongly disagree giving a percentage of 11.1%.





**Figure 20: University sustainability knowledge**

Overall, analysis on this sub-variable shows that the university is knowledgeable about issues concerning good source of drinking water, electricity and environmental protection programs. But has less knowledge on issues concerning waste management and effects of climate change in the city.

#### 4.2. Presentation of the findings of university sustainability management strategy

**Table 28: Representation of item 21, The university produce regularly sustainability reports**

	Frequency	Percent
Strongly disagree	14	14.1
Disagree	13	13.1
Neutral	29	29.3
Agree	26	26.3
Strongly agree	17	17.2
Total	99	100.0

The table above shows the frequency and percentage of respondents who provided responses for item 21 which state that, the university produce regularly sustainability reports 29 respondents were indecisive giving a percentage of 29.3% and 26 agree giving a percentage of 26.3% whereas 14 strongly disagree with 13 disagreeing to the item.



**Table 29: Representation of item 22: The university offers sustainability certifications**

	Frequency	Percent
Strongly disagree	7	7.1
Disagree	15	15.2
Neutral	34	34.3
Agree	28	28.3
Strongly agree	15	15.2
Total	99	100.0

The table above shows the frequency and percentage of respondents who provided responses to item 22, which state that; the university offers sustainability certificates. 34 respondents were indecisive whereas 28 agree, and 15 strongly agree that the university offer sustainability certifications. This is seen on their respective percentages given as 34.3%, 28.3%, and 15.2%.

**Table 30: Representation of item 23: The university common understanding of sustainability is reflected in inter-disciplinary and trans-disciplinary programs**

	Frequency	Percent
Strongly disagree	11	11.1
Disagree	16	16.2
Neutral	26	26.3
Agree	24	24.2
Strongly agree	22	22.2
Total	99	100.0

The table above shows the frequency and percentages of students who provided responses for item 23, which state that the university common understanding of sustainability issues is reflected in inter-disciplinary and trans-disciplinary programs. The result on the table shows that 26 respondents were indecisive whereas 24 agreed on the item giving a percentage of 24.2% and 22 respondent strongly agreed giving a percentage of 22.2%.



**Table 31: Representation of item 24; The community through elite leaders collaborate with school administration to improve on the quality of sustainability competence**

	Frequency	Percent
Strongly disagree	11	11.1
Disagree	12	12.1
Neutral	19	19.2
Agree	30	30.3
Strongly agree	27	27.3
Total	99	100.0

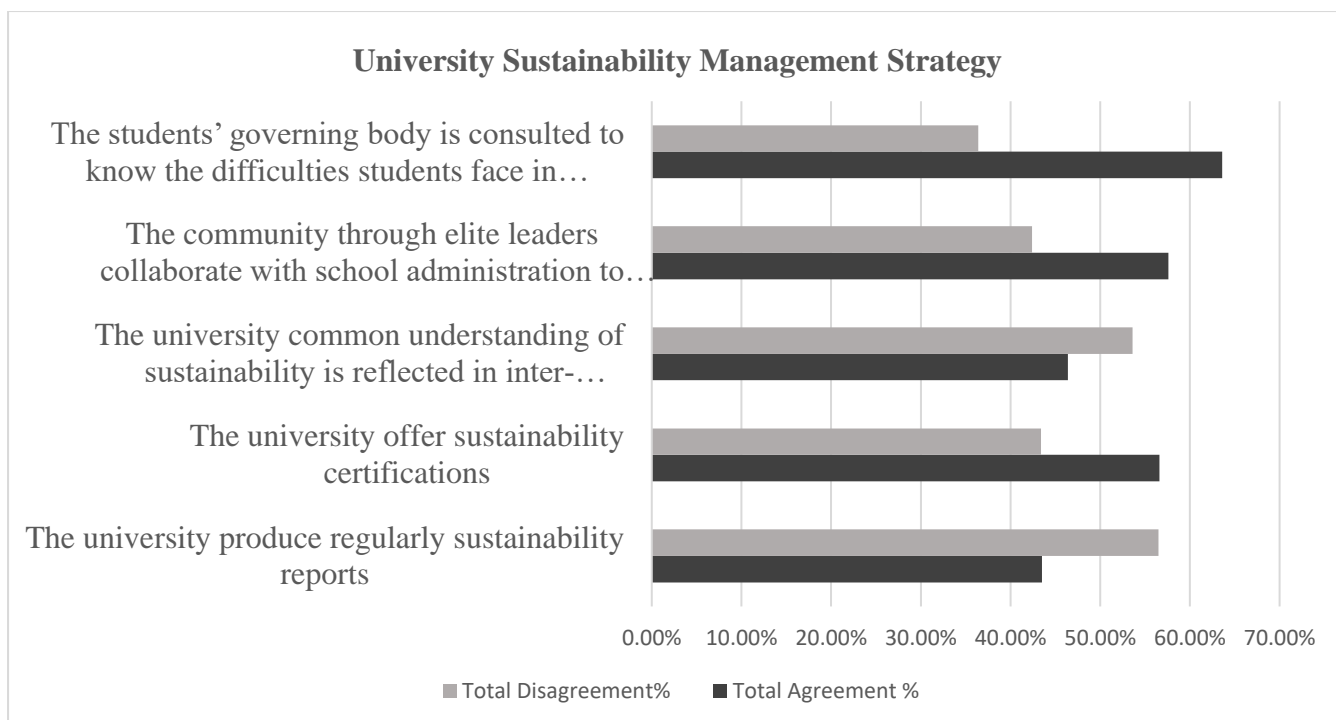
The table above shows the frequency and percentage of respondents who provided responses to item 24 above. The result of the table above shows that, 30 respondent agree on the item giving a percentage of 30.3% and 27 respondents strongly agree giving a percentage of 27.3% with 19 respondents being indecisive giving a percentage of 19.2%.

**Table 32: Representation of item 25: The student's governing body is consulted to know the difficulties students face in studying.**

	Frequency	Percent
Strongly disagree	9	9.1
Disagree	10	10.1
Neutral	17	17.2
Agree	32	32.3
Strongly agree	31	31.3
Total	99	100.0

The table above shows the frequency and percentage of respondents who provided responses to item 25, that state that the student's governing body is consulted to know the difficulties students faces in studying. 32 respondents agrees and 31 strongly agree to the item giving 32.3% and 31.3% respectively. Whereas 17 respondents were, indecisive and 10 respondents disagree giving 17.2% and 9.1% respectively.





**Figure 21: University sustainability management strategy**

Overall, majority agreed on the opinion that students' governing bodies are being consulted to know the difficulties that students face in studying sustainability concepts and also accept the fact that the community through elite leaders collaborate with school administration to improve on the quality of sustainability education. But disagreed that the university has common understanding of sustainability reflected the various disciplines (interdisciplinary and transdisciplinary) hence they do not produce regularly sustainability reports.

#### 4.3. Presentation of the findings for Competency for sustainable development

**Table 33: Representation of item 26: Knowledge of Sustainable Development requires that people understand how the economy works**

	Frequency	Percent
Strongly disagree	8	8.1
Disagree	7	7.1
Neutral	12	12.1
Agree	38	38.4
Strongly agree	34	34.3
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 26, the result on the table shows that, 38 respondents agrees and 34 strongly



agree giving a percentage of 38.4% and 34.3% respectively whereas 12 respondents were indecisive giving a percentage of 12.1%.

**Table 34: Representation of item 27: Knowledge of Sustainable Development results in fair distribution of goods and services to all people around the world**

	Frequency	Percent
Strongly disagree	9	9.1
Disagree	11	11.1
Neutral	21	21.2
Agree	32	32.3
Strongly agree	26	26.3
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 27, the result on the table shows that, 32 respondents agrees and 26 strongly agree giving a percentage of 32.3% and 26.3% respectively whereas 21 respondents were indecisive giving a percentage of 21.2%.

**Table 35: Representation of item 28: Knowledge of Sustainable Development enable attitudes which eliminate of poverty**

	Frequency	Percent
Strongly disagree	11	11.1
Disagree	10	10.1
Neutral	15	15.2
Agree	35	35.4
Strongly agree	28	28.3
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 28, which state that, knowledge of sustainable development enables the elimination of poverty, the result of the table shows that, 35 respondents agrees and 28 strongly agree giving a percentage of 35.4% and 28.3% respectively whereas 15 respondents were indecisive giving a percentage of 15.2%.



**Table 36: Representation of item 29: Knowledge of Sustainable Development does not enable the protection of biodiversity and environment**

	Frequency	Percent
Strongly disagree	28	28.3
Disagree	14	14.1
Neutral	16	16.2
Agree	19	19.2
Strongly agree	22	22.2
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 29, which state that, the knowledge of sustainable development does not enable the protection of biodiversity and environment. the result on the table shows that, 28 respondents strongly disagrees and 22 strongly agree giving a percentage of 28.3% and 22.2% respectively whereas 12 respondents were indecisive giving a percentage of 12.1%.

**Table 37: Representation of item 30: Knowledge of SD does not enable cultural diversity**

	Frequency	Percent
Strongly disagree	5	5.1
Disagree	5	5.1
Neutral	7	7.1
Agree	36	36.4
Strongly agree	46	46.5
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 30, the result on the table shows that, 46 respondents strongly agrees and 36 agree giving a percentage of 46.5% and 34.3% respectively whereas 7 respondents were indecisive giving a percentage of 7.1%.

**Table 38: Representation of item 31: Every person should receive education that teaches values and skills necessary for sustainable living in a community**

	Frequency	Percent
Strongly disagree	8	8.1
Disagree	6	6.1
Neutral	11	11.1
Agree	34	34.3
Strongly agree	40	40.4
Total	99	100.0



The table above shows the frequency and percentage of the respondents who provided responses to item 31, the result on the table shows that, 40 respondents agrees and 34 strongly agree giving a percentage of 40.4% and 34.3% respectively whereas 11 respondents were indecisive giving a percentage of 11.1%.

**Table 39: Representation of item 32: Males and females should have equal access to all kinds of education and employment.**

	Frequency	Percent
Strongly disagree	5	5.1
Disagree	16	16.2
Neutral	9	9.1
Agree	33	33.3
Strongly agree	36	36.4
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 32, the result on the table shows that, 36 respondents strongly agrees and 33 agree giving a percentage of 36.4% and 33.3% respectively whereas 12 respondents were indecisive giving a percentage of 12.1%.

**Table 40: Representation of item 33; Citizens who pollute the land, air or water should pay for damage done to communities and the environment**

	Frequency	Percent
Strongly disagree	7	7.1
Disagree	18	18.2
Neutral	15	15.2
Agree	33	33.3
Strongly agree	26	26.3
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 33, the result on the table shows that, 33 respondents agrees and 26 strongly agree giving a percentage of 33.3% and 26.3% respectively whereas 18 respondents disagree giving a percentage of 18.2%.



**Table 41: Representation of item 34: Household tasks should be equally shared among members of the household regardless of gender**

	Frequency	Percent
Strongly disagree	13	13.1
Disagree	12	12.1
Neutral	19	19.2
Agree	35	35.4
Strongly agree	20	20.2
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 34, the result on the table shows that, 35 respondents agrees and 20 strongly agree giving a percentage of 35.4% and 20.2% respectively whereas 19 respondents were indecisive giving a percentage of 19.5%.

**Table 42: Representation of item 35: As long as resources are available, using more than we need now does not threaten the health and welfare of future generations.**

	Frequency	Percent
Strongly disagree	22	22.2
Disagree	19	19.2
Neutral	25	25.3
Agree	22	22.2
Strongly agree	11	11.1
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 35, the result on the table shows that, 25 respondents were indecisive and 22 agree giving a percentage of 25.3% and 22.2% respectively whereas 22 respondents strongly disagree giving a percentage of 22.2%.



**Table 43: Representation of item 36: I recycle waste as much as i can at home**

	Frequency	Percent
Strongly disagree	9	9.1
Disagree	16	16.2
Neutral	25	25.3
Agree	30	30.3
Strongly agree	19	19.2
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 36, the result on the table shows that, 30 respondents agrees and 19 strongly agree giving a percentage of 30.3% and 19.2% respectively whereas 25 respondents were indecisive giving a percentage of 25.3%.

**Table 44: Representation of item 37: I try to do things that will help people live out of poverty**

	Frequency	Percent
Strongly disagree	5	5.1
Disagree	20	20.2
Neutral	20	20.2
Agree	31	31.3
Strongly agree	23	23.2
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 37, the result on the table shows that, 31 respondents agrees and 23 strongly agree giving a percentage of 31.3% and 23.2% respectively whereas 20 respondents were indecisive giving a percentage of 20.2%.



**Table 45: Representation of item 38: I pick up litter when I see it in a park or a natural area**

	Frequency	Percent
Strongly disagree	9	9.1
Disagree	29	29.3
Neutral	23	23.2
Agree	22	22.2
Strongly agree	16	16.2
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 38. The result on the table shows that, 29 respondents disagree and 23 were indecisive giving a percentage of 29.3% and 23.3% whereas 22 respondents agreed and 16 strongly agreed on the item which state that I pick up litters when I see it in a park or a natural area giving a percentage of 22.3% and 16.2% respectively.

**Table 46: Representation of item 39: I participate in democratic activities related to student life at the university**

	Frequency	Percent
Strongly disagree	8	8.1
Disagree	21	21.2
Neutral	25	25.3
Agree	33	33.3
Strongly agree	12	12.1
Total	99	100.0

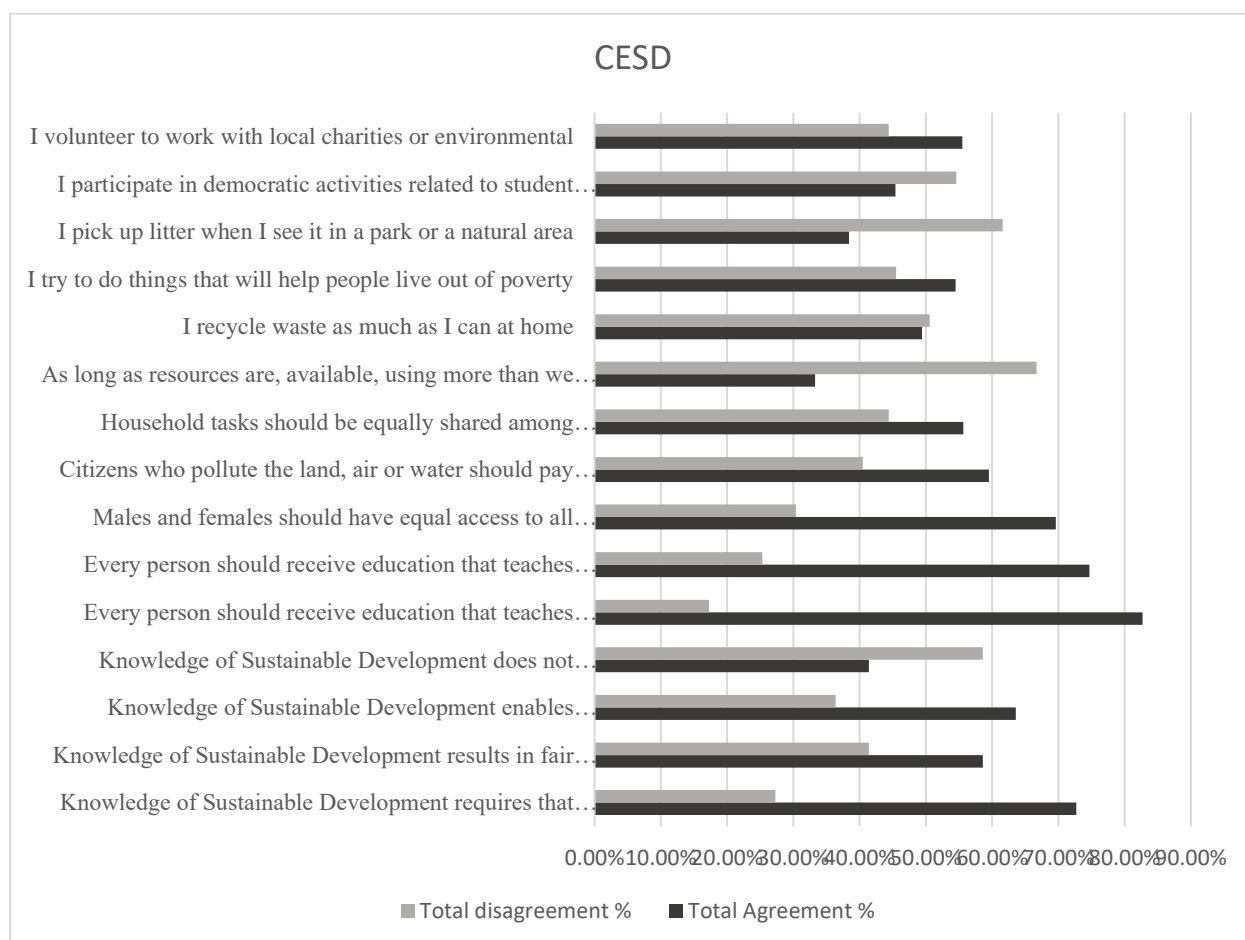
The table above shows the frequency and percentage of the respondents who provided responses to item 33, the result on the table shows that, 38 respondents agrees and 12 strongly agree giving a percentage of 33.3% and 12.1% respectively whereas 25 respondents were indecisive and 21 disagreed giving a percentage of 25.3% and 21.2% respectively.



**Table 47: Representation of item 40: I volunteer to work with local charities or environmental organization**

	Frequency	Percent
Strongly disagree	13	13.1
Disagree	17	17.2
Neutral	14	14.1
Agree	37	37.4
Strongly agree	18	18.2
Total	99	100.0

The table above shows the frequency and percentage of the respondents who provided responses to item 40, the result on the table shows that, 37 respondents agrees and 18 strongly agree giving a percentage of 37.4% and 18.2% respectively whereas 14 respondents were indecisive giving a percentage of 14.1%.



**Figure 22: Students' competency in education for sustainable development.**



Overall, the majority of the students agreed on the fact that knowledge in sustainable development enables them to understand how the economy works. Moreover, it helps them to know how goods and services can be distributed fairly to all people around the world, permitting them to live in such a way as to eliminate poverty in their community and others. For most of the students, every individual should receive an education that teaches values and skills necessary for sustainable living within the community. This will valorize both males and females, giving them equal access and opportunities to all kinds of education and employment. Thus, enabling tasks to be shared equally among members of the household regardless of their gender. Such knowledge and attitude help them do things that help people live out of poverty, and also enable them to volunteer to work with local charity and environmental organizations. In addition, the knowledge of sustainable development enables the protection of biodiversity and the environment. Thus, as long as resources are available, using more than what they need threatens the health and welfare of future generations. However, they are not well prepared to pick up litter when they come across it, whether on campus or on other ground, and are not interested in participating in democratic activities related to student life on campus.

#### **4.4. Summary of descriptive statistics**

Overall, the majority disagreed that the university has a sustainable development policy, action plan with vice chancellors or vice rectors who act as sustainability officers to address sustainability issues and matters within the university. But they agreed that the university has a sustainable development program.

Moreover, they agree that the university strives for environmental and social sustainability culture and has important sustainability goals, but does not strive for economic sustainability and also does not innovate or measure new product progress in sustainability.

Furthermore, the university gives training on environmental awareness through environmental programs and deals with environmentally friendly suppliers, but does not practice recycling of waste, water, and electrical conservation.

Further analysis showed that the university is knowledgeable about issues concerning a good source of drinking water, electricity, and environmental protection programs, but has less knowledge on issues concerning waste management and the effects of climate change in the city.

In addition, the majority also agreed on the fact that student governing bodies are consulted to know the difficulties students face in studying sustainability concepts. Also, the community, through elite leaders, collaborates with the school administration to improve the



quality of sustainability programs; this allows the university to offer regularly sustainability-focused certifications. However, they disagreed that the common understanding of the university on sustainability is reflected in inter-disciplinary and trans-disciplinary programs. As a result, the university has difficulties in producing regular sustainability reports to be accountable.

Further analysis showed that the majority of the students agreed on the fact that knowledge in sustainable development enables them to understand how the economy works. Moreover, it helps them to know how goods and services can be distributed fairly to all people around the world, permitting them to live in such a way as to eliminate poverty in their community and others. For most of the students, every individual should receive an education that teaches values and skills necessary for sustainable living within the community. This will valorize both males and females, giving them equal access and opportunities to all kinds of education and employment. Thus, enabling tasks to be shared equally among members of the household regardless of their gender.

Such knowledge and attitude help them do things that help people live out of poverty, and also enable them to volunteer to work with local charity and environmental organizations. Similarly, knowledge of sustainable development enables the protection of biodiversity and the environment. Thus, as long as resources are available, using more than what they need threatens the health and welfare of future generations. However, they are not well prepared to pick up litter when they come across it, whether on campus or on other ground, and are not interested in participating in democratic activities related to student life on campus.



## 4.5. Inferential statistics

Inferential statistics make use of tools for data analysis in a way that will address the research question or hypothesis. It involves statements that are statistically testable. The purpose of inferential statistics is to draw inferences about relationships, which exist in the population when only a small subset of cases from that population has been studied.

### 4.5.1. Regression Analysis

Regression is one of the most important and commonly used data analysis processes. Simply put, it is a statistical method that explains the strength of a relationship between a dependent variable and one or more independent variables. The dependent variable here is the variable we are trying to predict or understand, whereas the independent variable is the variable which might have an impact on the dependent variable.

#### Reading a regression table

The regression table is divided mainly into three components:

**Analysis of variance (ANOVA):** it provides analysis of the variance in the model.

**Regression statistics:** it provides numerical information on the variation and how well the model explains the variable for the given data/observations.

**Residual output:** It provides the value predicted by the model and the difference between the actual observed value of the dependent variable and its predicted value by the regression model for each variable.

#### The degree of freedom (df)

The degree of freedom is the number of independent variables in our model. The total degree of freedom is the sum of the regression and residual degrees of freedom, which equals the size of the dataset minus 1.

#### The sum of squares

It is the total variation in the dependent variable that is explained by the regression model. It is the sum of the squares of the difference between the predicted value and the mean of the value of all the data set  $\sum(\tilde{y} - \bar{y})^2$ .

#### Mean square Errors(MS)

It is the sum of squares divided by the degree of freedom  $\sum(\tilde{y} - \bar{y})^2/\text{Reg df}$



### F-Statistics

F- Statistics is used to test the hypothesis that the slope of the independent variable is zero.

**Significance of the F-test.** It is nothing but the p-value for the null hypothesis which states that the coefficient of the independent variable is zero, and as with any p-value, a significant relationship exists between the dependent and independent variables.

### Standard Error

This is the estimated standard deviation of the error of the regression equation and is a good measure of the accuracy of the square root of the residual mean errors.

Regression enables the establishment of a predictive model for a relationship or effect between two variables that has been generated from a sample. In this section of analysis, both linear regression and multivariate regression analysis are used to examine whether there is a significant effect between the sub-variables of the independent variable “Sustainable University Governance,” on the dependent variable students’ competency in education for sustainable development. However, finding out the combined effect of the factors will tell whether sustainable university governance has an effect on students’ CESD or not.

#### 4.5.2. Multivariate Regression Analysis.

Multilinear regression analysis is the ideal test when there is one dependent variable and more than one independent variable.

#### 4.5.3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.490 <sup>a</sup>	.240	.199	.51687

a. Predictors: (Constant), USMS, USC, USK, USPS, USP

b. Dependent Variable: CESD

**The multivariate correlation coefficient (person correlation (R))** measures the relationship between the dependent variable and the independent variable.

**The coefficient of determination (R<sup>2</sup>)** indicates how much of the variance of the dependent variable can cause the variation of the independent variable

**Adjusted (R<sup>2</sup>);** R<sup>2</sup> over estimates the coefficient of determination just when many independent variables are use.



**Standard estimation error;** indicates by how much the model over estimates the dependent variable on average.

#### 4.5.4. ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	7.844	5	1.569	5.872	.000 <sup>b</sup>

a. Dependent Variable: CESD

b. Predictors: (Constant), USMS, USC, USK, USPS, USP

From ANOVA table, the sum of square for USG is 7.844.  $7.844 * 100$  is equal to 78.4%, this shows that 78.4% of USG explains the variability of CESD.

#### 4.5.5. Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.232	.290		7.686	.000
USP	.005	.101	.006	.050	.270
USC	.020	.100	.025	.198	.843
USPs	-.116	.089	-.165	-1.305	.195
USK	.254	.076	.365	3.362	.001
USMS	.186	.075	.284	2.481	.015

a. Dependent Variable: CESD

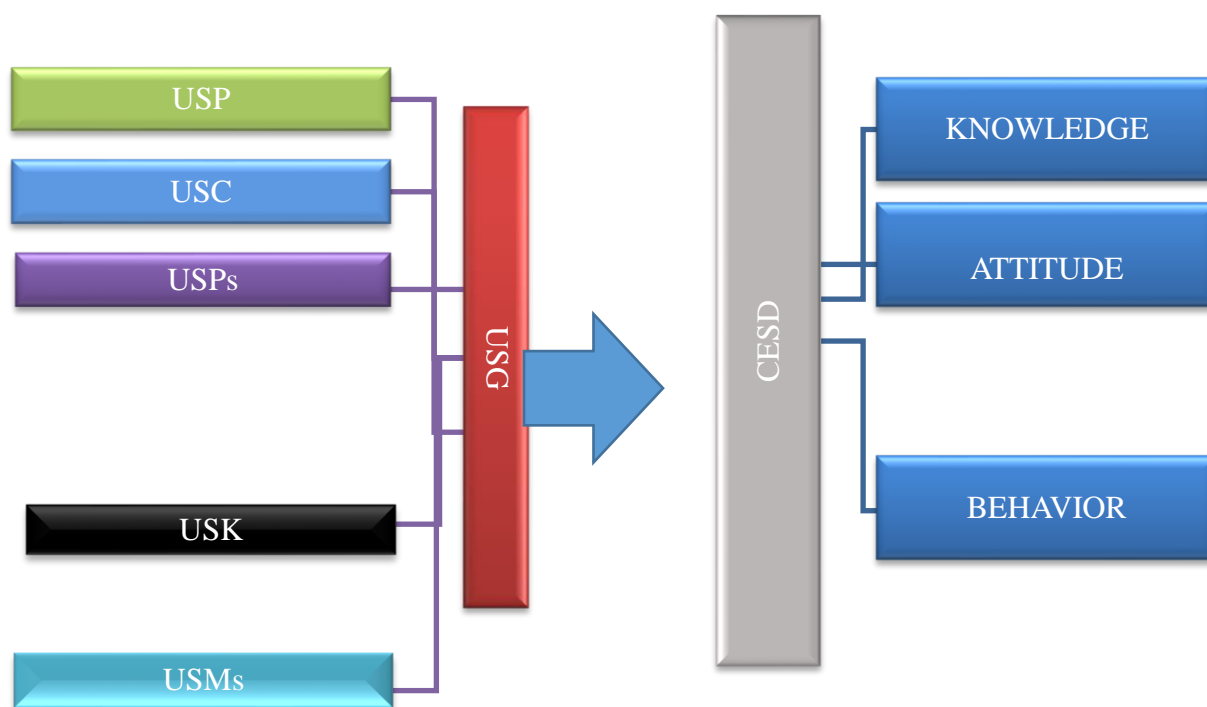
*the regression equation is given as*  $CD = b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + \varepsilon$

Where  $x_1 = usp$ ,  $x_2 = usc$ ,  $x_3 = usps$ ,  $x_4 = usk$ ,  $x_5 = usms$

$$CD = 0.006x_1 + 0.025x_2 - 0.165x_3 + 0.365x_4 + 0.284x_5 + \sqrt{1 - 0.240}$$

$$CD = 0.006x_1 + 0.025x_2 - 0.165x_3 + 0.365x_4 + 0.284x_5 + 0.872$$





#### 4.5.6. Linear Regression analysis of USP, USC, USPS, USK, USMS.

A linear regression analysis was performed to establish a one-to-one corresponding model between each factors and the dependent variable with the aim of determining the effects of each variable. Such analysis could not be done without stating the null hypothesis since the result is drawn from the analysis of the hypothesis.

##### Effect of University sustainability politics (USP)

**H<sub>01</sub>:** There exist no significant effect of university sustainability politics on students' competency in education for sustainable development.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.223 <sup>a</sup>	.050	.040	.566

a. Predictors: USP

ANOVA<sup>a</sup>



Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1.620	1	1.620	5.056	.270 <sup>b</sup>

a. Dependent Variable: CESD

b. Predictors: USP

From ANOVA table, the sum of square for USP is 1.620.  $1.62 \times 100$  is equal to 16.2%, this shows that only 16.2% of USP explains the variability of CESD when used as a linear independent factor USG.

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
USP	.174	.078	.223	2.249	.270

a. Dependent Variable: CESD

The R-value of 0.223 shows a weak and positive effect between USP and CESD, and the sum of squares value of 16.2% shows that about 16.2% of the change in CESD is explained by USP, and a greater part of about 83.8% is captured by the error term. This shows that the model has a poor fit but is adequate for the study. Given that the standardized coefficient (B) = 0.223,  $F = 5.056$ ,  $\text{sig} = 0.270 > 0.05$ , this shows that USP has no effect on CESD. The model can be established as  $\text{CESD} = 0.174 (\text{USP}) + 2.897$ . Based on this analysis, it shows that university sustainability politics is not a positive determinant of students' competency in education for sustainable development in the UYi, i.e., USP has no effect on students' competency for sustainable development in the university. However, to be completely certain, there is a need to evaluate the combined effect showing how it affects CESD as a factor of USG. This will enable us to conclude whether it enhances students' competency in education for sustainable development or not.



### Effect of University sustainability culture (USC)

**H<sub>02</sub>:** There is no significant effect of university sustainability culture on students' competency in education for sustainable development.

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.195 <sup>a</sup>	.038	.028	.570

a. Predictors: (Constant), USC

#### ANOVA<sup>a</sup>

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	1.243	1	1.243	3.833	.053 <sup>b</sup>

#### Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
	.152	.078	.195	1.958	.053
USC					

The R-value of 0.195 shows that there is a weak and positive effect between the two variables. The sum of squares value of 12.4% shows that about 12.4% of the change in CESD is explained by USC, and a greater part of about 87.6% is captured by the error term. This shows that the model has a poor fit but is suitable for the study. Given that the standardized coefficient (B) = 0.223, F = 5.056, sig = 0.053 > 0.05, the model was established as CESD = 0.152 (USC) + 0.195. Based on the linear analysis carried out, it shows that university sustainability culture does not have a significant effect on students' competency in education for sustainable development in UY1. That is, however, evaluating the combined effect will enable the final conclusion as to whether USC as a factor of USG enhances students' competency in education for sustainable development in the University of Yaounde I. This will enable us to find out if it has a unique effect on students' competency or a combined effect.



### Effect of University sustainability practice (USPs)

**H<sub>03</sub>:** There is no significant effect of university sustainability practice on students' competency in education for sustainable development.

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.174 <sup>a</sup>	.030	.020	.572

#### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.988	1	.988	3.022	.085 <sup>b</sup>

a. Dependent Variable: CESD

b. Predictors: USPs

From ANOVA table, the sum of square for USPs is 0.988.  $0.988 * 100$  is equal to 98.8%, this shows that will 98.8% of USPs explains the variability of CESD when used as a linear independent factor USG.

#### Coefficient

Model	Unstandardized Coefficients		Standardized	t	Sig.	
	B	Std. Error	Coefficients Beta			
	USPs	.122	.070	.174	1.738	.085

a. Dependent Variable: CESD

The R-value of 0.377 shows that there is a moderate and positive correlation between the two variables. The R squared value of 0.142 shows that about 14.2% of the change in CESD is explained by USMS, and a greater part of about 53.8% is captured by the error term. This



shows that the model has a poor fit. Given that the standardized coefficient (B) = 0.247, F = 16.055, sig = 0.000 < 0.05, the model was established as  $CESD = 0.247(USMS) + 0.377$ . Based on the linear analysis carried out on university sustainability management strategy (USMS), it shows that the university sustainability management strategy has a positive effect on students' competency for sustainable development in UY1, that is, good USMS leads to adequacy in students' competency in education for sustainable development in the university. However, evaluating the combined effect will enable the final decision on the effect as a factor of USG that enhances students' competency or not.

### Effect of University Sustainability Knowledge (USK)

**Ho4:** There exist no significant effect of university sustainability knowledge on students' competency in education for sustainable development.

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.426 <sup>a</sup>	.181	.173	.525

a. Predictors: USK

#### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.929	1	5.929	21.475	.000 <sup>b</sup>

a. Dependent Variable: CESD

b. Predictors: USK

From ANOVA table, the sum of square for USK is 5.929.  $5.929 * 100$  is equal to 59.3%, this shows that 59.3% of USK explains the variability of CESD when used as a linear independent factor USG.

#### Coefficients<sup>a</sup>



Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
USK	.296	.064	.426	4.634	.000

a. Dependent Variable: CESD

The R-value of 0.426 shows that there is a moderate and positive correlation between the two variables. The sum of square value of 0.593 shows that, about 59.3% change in CESD is explain by USK, and a greater part of about 40.7% is capture by the error term, this shows that, the model has a poor fit. Given that the standardize coefficient (B) = 0.296, F= 21.475, sig = 0.000 < 0.05 the model was established to be  $CESD = 0.296(USK) + 0.426$ . Based on the linear analysis carried out on university sustainability knowledge (USK), it shows that, university sustainability knowledge has a significant effect on students' competency in education for sustainable development in the UY1, that is, a good USK lead to an adequacy in students' competency in education for sustainable development in the university. However, evaluating the combine effect will enable the final decision on USK as a factor of USG, that can enhances students' competency in education for sustainable development in the university of Yaounde 1.

### **Effect of university sustainability management strategy (USMS)**

**Hos:** There exist no significant effect between university sustainability management strategy and students' competency in education for sustainable development.

### **Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.377 <sup>a</sup>	.142	.133	.538



a. Predictors: USMS

#### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.645	1	4.645	16.055	.000 <sup>b</sup>

a. Dependent Variable: CESD

b. Predictors: (Constant), USMS

From ANOVA table, the sum of square for USMS is 4.645.  $4.645 \times 100$  is equal to 46.5%, this shows that 46.5% of USMS explains the variability of CESD when used as a linear independent factor USG.

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized	t	Sig.	
	B	Std. Error	Coefficients			
	USMS	.247	.062	.377	4.007	.000

a. Dependent Variable: CESD

The R-value of 0.377 shows that there is a moderate and positive correlation between the two variables. The R square value of 0.142 shows that, about 14.2% change in CESD is explain by USMS, and a greater part of about 53.8% is capture by the error term. This shows that, the model has a poor fit. Given that the standardize coefficient (B) = 0.247, F= 16.055, sig = 0.000 < 0.05 the model was established to be  $CESD = 0.247(USMS) + 0.377$ . Based on the linear analysis carried out on university sustainability management strategy (USMS), it shows that, university sustainability management strategy has a positive effect on students' competency for sustainable development in the UY1, that is, good USMS leads to an adequacy in students' competency in education for sustainable development in the university. However, evaluating the combine effect will enable the final decision on the effect as a factor of USG that enhances students' competency or not.



**Model summary table:** R on the summary table represent the person correlation coefficient(R) which describes the strength and direction of linear relationship between sustainable university governance and students' competency in education for sustainable development. The R-value of 0.368 shows that sustainable university governance has a positive effect on students' competency in education for sustainable development in the University of Yaounde I.

**R-square ( $R^2$ ):** R square is the coefficient determination use to measure the goodness of fit or the explanatory power of a model. It exist between 0 to 1. Officially, R square provides the proportion or percentage of the total variation in the dependent variable that is explained by the independent variables. The R square value of 0.126 show that about 12.6% change in CESD is explain by USP, USC,USPs, USK, USMS jointly while a greater part of about 87.4% is capture by the error term, this shows that, the model has poor fit.

**Adjusted R-squared:** This is a modified version of R-square that has been adjusted for the number of independent variables in the model. The adjusted  $-R^2$  penalizes  $R^2$  for the additional number of variables that do not contribute to the explanatory power of the model. The adjusted R-square model of 0.135 shows that about 13.5% percentage changes in CESD, is explained by USP, USC,USPs USK, USMS, jointly, while a greater part of about 86.5% is captured by the error term, it also shows that the model has a poor fit which is good for the model established for the study.

**Durbin-Watson statistics:** It measures the evidence of autocorrelation in the residuals. The acceptable DW range of no autocorrelation is in between 1.45 to 2.44. Thus, the fitted regression line value, shows that there is autocorrelation as indicated by the DW statistic value of 2.301.

#### 4.5.7. Summary of chapter four

In this section, we had to carryout descriptive and inferential statistics. This involve presenting data, analysing the data, and presentation of its result. For descriptive analysis, the result were presented on tables showing the various frequencies and percentages of respondents who responded to the items. Similarly, for inferential statistics the results were presented from the stand point of the analysis of the effects of USG on CESD, then each factors of USG was analyse to show its individual effects on the dependent variable CESD.

That is USP, USC, USPs, USK and USMS were analyse individually to show their percentage variation on CESD.



Overall, the result of the analysis gave a P-value of 0.00 for USG, which is less than an alpha value of 0.05 at a 5% significance level. This led to the rejection of the null hypothesis and the acceptance of the alternative hypothesis, which states that there exists a significant effect of sustainable university governance on students' competency in education for sustainable development in the University of Yaounde I.

**Table 49 summary for multivariate analysis and p-values of the individual sub variables**

<b>Model</b>	<b>factors</b>	<b>P-values</b>
	USP	.270
	USC	.053
	USPS	.085
	USK	.000
	USMS	.000

**Table 50 Summary table for the combine factors**

<b>Hypothesis</b>	<b>Alpha value</b>	<b>(P) values</b>	<b>Sub Variables</b>	<b>Decision</b>
Ho1	0.05	0.270	USP	Ho1 retain: Ha1 rejected
Ho2		0.053	USC	Ho2 retain : Ha2 rejected
Ho3		0.195	USPs	Ho3 retain : Ha3 rejected
Ho4		0.001	USK	Ho4 rejected : Ha4 retain
Ho5		0.015	USMs	Ho5 rejected : Ha5 retain

The rejection of the null hypothesis signifies that the p-values are less than the alpha-value (0.05). The acceptance of the alternative hypothesis signifies that the p-values (sig) are less than the alpha-value (0.05). Retaining the hypothesis showed that there exists a statistical



significant effect of university sustainability policies on students' competency. This means the university cannot independently make use of appropriate university sustainability policies to influence policies, action plans, programs, and sustainability officers to enhance students' competency. Similarly, that of USC and USPs shows the same result, permitting the rejection of three null hypotheses and the acceptance of two null hypotheses. The result obtained could not permit us to reject the main null hypothesis; thus, we opted for a linear regression. This allowed us to validate the main research alternative hypothesis and the rejection of the main null hypothesis. The following result will be developed and discussed appropriately in chapter five, where the researcher will support this assertion with tangible evidence, drawing conclusions from the findings of other authors who worked on similar themes and had similar or different results.

**Table 51 Percentage variability of each factors of USG on CESD**

<b>Factors of USG</b>	<b>% of the factors of USG that causes a change on CESD</b>	<b>% to increase</b>	<b>items responsible for the change</b>
<b>USP</b>	16.2	73.8	Sustainability programs
<b>USC</b>	12.4	87.6	Environmental and social sustainability
<b>USPs</b>	98.8	1.2	Environmental awareness, environmental programs, environmental friendly supplier
<b>USK</b>	59.3	40.7	Water and electricity conservation Environmental protection programs
<b>USMs</b>	46.6	53.4	Governing bodies, sustainability programs and certification
<b>USG</b>	78.5	21.6	USK, USMs

From the analysis it shows that:

59.3% variability observed in students' knowledge, attitudes and behavior (CESD) is cause by USK.

46.6% variability observed on students' knowledge, attitudes and behavior is caused by USMs.

Overall, the combined data shows that 78.5% of the variability in students' knowledge, attitudes, and behavior (CESD) is caused by USG in the University of Yaounde 1.



#### **4.5.9. Conclusion of chapter four**

To conclude this chapter, the analysis began with a multivariate analysis, then ended with a linear analysis aiming to show the specific effect of the factors of USG on CESD. That is, USP, USC, USPs, and USMS on the dependent variable CESD. The last linear regression analysis was done so as to show each sub-variable's effect and its percentage variability on the dependent variable CESD. The result showed that USG has a significant effect on CESD, and USG accounts for 78.5% change in students' competency in education for sustainable development in the University of Yaounde 1.



**CHAPTER FIVE**  
**SUMMARY, CONCLUSION AND RECOMMENDATIONS**



In this chapter, the researcher will summarize, discuss, and draw conclusions on the analysis, and also provide recommendations for further research. This will allow the researcher to discuss the effects of sustainable university governance on students' competency in education for sustainable development.

### **5.1. Summary of the findings**

In this section, we are going to discuss the results according to the hypotheses of the study. The results are discussed from the standpoint of the single effect of each factor affecting CESD, then followed by the combined effect of the factors to show how it affects CESD as a single factor. We will support the discussion with appropriate models, paradigms, and theories to back up the discussion where it will be necessary. For us to properly discuss the result, we will begin with an overall review of what was done at the analysis.

A multivariate regression analysis allowed us to analyze the effect of the combined factor of the independent variable USG on the dependent variable CESD. That is, USP, USC, USPs, USK, and USMS on students' competency. We further carried out a linear regression analysis to determine the individual effect of the factors on CESD.

The overall result of the analysis gave a p-value of 0.00, which is less than an alpha value of 0.05 at a 5% significance level. This led to the rejection of the null hypothesis and the acceptance of the alternative hypothesis, which stated that there is a significant effect of sustainable university governance on students' competency in education for sustainable development in the University of Yaounde 1.

We will begin the discussion on the analysis of the effect of university sustainability politics, culture, practice, knowledge, and management strategies on students' competency in education for sustainable development with;

#### **5.1.1. Analysis on the effect of university sustainability politics (USP) on students' competency in education for sustainable development.**

From descriptive analysis, the result showed that, overall, the majority disagreed with the fact that the university has a sustainable development policy and action plan with vice-chancellors or vice-rectors who act as sustainability officers to address sustainability issues and



matters within the university. But they agreed that the university has a sustainable development program.

In a study by Agbemabiese et al. (2019), it was shown that universities with dedicated sustainability policies and strategies were more likely to engage in sustainable practices. In another study by Park et al. (2018), it was found that administrators who championed sustainability initiatives and provided resources for sustainability projects were more successful in promoting sustainable development on campus. This underscores the importance of sustainability officers' strong leadership in driving sustainability efforts within universities. University sustainability officers who are leaders are not limited to the rectors, the vice-rector, or chancellors, and deans only, but also include other managers who have the power to set the strategic direction for sustainability on campus and inspire a culture of sustainability among faculty, staff, and students. These authors have shown that proactive leadership and commitment to sustainability at the top level of the university can lead to the successful implementation of sustainability initiatives and the integration of sustainability into core university activities, which helps in building students' skills efficiently.

However, from inferential statistics, the result of the analysis shows that there is no significant effect of university sustainability politics on students' competency for sustainable development. This shows a divergent opinion from that of Leal Filho. That is, a P-value of 0.270, which is greater than the alpha-value of 0.05.

This means that the effect is felt more when university sustainability politics is used as a combined governance mechanism but felt less when this factor is individually used as a governing mechanism to integrate sustainability.

This allowed us to accept the fact that using university sustainability politics as an individual factor of sustainability governance will have a greater effect on students' competency if the competency is to promote sustainable development.

However, in the University of Yaounde 1, this factor is being used as a combined factor with the following factors: USC, USPs, USK, and USMS, whose effects are felt as one (the combined effect). Thus, the combined effect is necessary to conclude if it has a general effect on students' competency or not. To affirm such a result, we opted for a multivariate regression



analysis, which gave a P-value of 0.270, that is greater than an alpha value of 0.05, thus allowing us to conclude that there is no significant effect of university sustainability politics on students' competency for sustainable development in the University of Yaounde 1.

According to systems theory by Luhmann, a system is autopoietic and is enhanced by communication. Therefore, from the standpoint of systems theory, the university is a subsystem that is creative and self-referential. The politics within should enable the creation and implementation of sustainable development policies at all levels of the faculty to inculcate the notion of sustainable development in students. This allows the university to stand out or to be referential through the skills it trains. Sustainable development action plans are wonderful plans that can be used by the university to improve their action plan for program implementation. Moreover, to support students' competency for sustainable development, the choice and type of programs matter.

This will allow the officers to synchronize the objectives of sustainable development and that of the university, creating an ideal policy and program to enhance students' competency. That is, the right and freedom in the choices of the different types of programs depend largely on the governance mechanism in place. However, administrators use this right and freedom differently, and the functional system determines the criteria for inclusion or exclusion of the program. This idea presupposes equality in law and freedom in the principles of inclusion for a given program in the system. Which can be legitimized by anyone who can achieve them, and exclusion can be seen as temporal and vulnerable to change.

This shows that there exist two dominant groups in the university, the pluralist and elitist. The pluralist approach competes to shape policy by shaping the programs and making it a product of dynamic interplay for the university's interest. The interest may not have the same resources and goals, but there is an ultimate representation of the pluralist view. Whereas the elite approach stresses that the organization is neither neutral nor has disinterested actors who are devoted to the progress of knowledge nor competing equally in shaping policies. For any governance process, a program has to be designed and implemented to improve its effectiveness. The university's initiatives can only be coherent with that of sustainable development when it conforms to the principles and laws of development.



However, the extent to which the university handles sustainability is unclear and, to a certain extent, not legitimate, as it adheres to new ethos without a sustainable reporting system. It is clear from its distribution of the environmental performance report at the geography series that the determination to practice green politics remains an issue for discussion. In the area of ‘greening the curriculum’, it is not very clear at this point whether the faculty considers sustainable development programs academically legitimate and a priority for learning. Meanwhile, students’ levels show greater progress in some academic programs and fields, such as geography, biology, and chemistry. However, students’ research activities are still very broad in scope and limited to a few aspects of environmental programs, while leaving out economic and social justice programs, which aid in societal health.

Results of the analysis of this factor show that university sustainability politics, as a factor of Sustainable University Governance, is not being used as a mechanism to enhance students’ competence for sustainable development. From the result, it shows that managers do not really act sustainably and responsibly in implementing policy action plans but implement programs that are contextually relevant to enhance students’ competency in education for sustainable development. However, it is limited to some faculties and disciplines.

According to organizational structural theory, the principles governing policies for sustainable development in the university must be set at the top level of the university. As such, the use of a top-down planning framework with a clearly defined chain of command enables the formulation of proper policies, action plans, and programs. This ensures that officers or managers who are responsible for decision-making for sustainable development are prepared. Furthermore, the relationship between university sustainability officers, the management team, and students defines the strategies, actions, and activities to be performed (Allport, 2001, pp.6-8).

### **5.1.2. Analysis on the Effect of University Sustainability Culture (USC) on Students’ Competency in Education for Sustainable Development**

Overall, from descriptive statistics, the majority agreed that the university strives for environmental and social sustainability culture and has an important sustainability type but disagreed with the fact that the university strives for economic sustainability and also does not measure new product progress (innovative) in sustainability.



From such analysis, it shows that the university can only be innovative when it engages completely in developing skills that foster creativity. By doing so, it will enable conditions that lead to the creation of new products that can promote economic growth. Such products have high sustainability value and are in high demand in the market. Moreover, the result of their productivity can increase the visibility of the university due to the type of skills and competencies it releases as products in the workforce.

A mastery of instruments often leads to instrumental skills, which can be tailored into lifelong sustainability skills needed by students to promote sustainable development. For example, the University of Yaounde 1 has been promoting green transportation by using campus vehicles that are rechargeable by solar panel stations. Such culture permitted, to a certain degree, the reduction of carbon emissions within the campus, hence enhancing skill development by creating awareness in the area of renewable energy.

Based on the linear analysis carried out, the analysis showed that university sustainability culture is not a significant predictor of students' competency in education for sustainable development in the University of Yaounde 1. However, evaluating the combined effect will enable us to determine whether there is a positive effect on CESD or not.

From the combined analysis, the result led to the acceptance of the null hypothesis with no sufficient evidence to support the alternative hypothesis, showing that there is no statistically significant effect of university sustainability culture on students' competency for sustainable development in the University of Yaounde 1. The university does not have a defined culture that spells out sustainability practices and culture.

This result is similar to the findings of a study done by Ben & al., (2018), which shows that sustainability culture varies from university to university and country to country. By taking sustainability action, it can allow students to see opportunities, but it requires students to be competent and cultured in sustainability. This implies that university managers actually have to strive to develop economic, environmental, and social cultures that favor sustainable development, which can be made possible only if they promote values like equity, peace, social



justice, and human rights in their daily activities. This will enable students to exhibit attitudes and behavior in their day-to-day interactions, which greatly enhances their competency.

### **5.1.3. Analysis on the effect of university sustainability practice on students' competency in education for sustainable development.**

Overall, from descriptive statistics, the majority agreed that the university provides training on environmental awareness through environmental programs and engages with environmentally friendly suppliers. However, they disagreed that the university practices recycling of waste, water, and electricity. This result is similar to the findings obtained in Malaysia by Jusoh (2018), who conducted a study to assess the level of environmental awareness among university students. The study found that environmental awareness among students at the University of Kebangsaan Malaysia (UKM) was high, but their willingness to engage in solving societal environmental problems was low. A similar outcome was observed in another study, where students' knowledge and attitudes were at a high level, but their environmental care practices remained at a moderate level.

The same opinion has been put forth by many schools of thought, showing that while students are aware of environmental issues, this awareness is not being translated into action. An analysis of the results also supports the opinion that there is increasing awareness of environmental, water, and energy conservation, but the level of students' involvement in environmental activities remains low.

Further analysis yielded a standardized beta coefficient ( $B = -0.165 < 1.65$ ) and a  $t$ -value ( $t = -1.35$ ). The beta value of  $-0.165$  is less than  $1.65$ , with a  $p$ -value of  $0.195$ , which is greater than the alpha value of  $0.05$ . This result indicates that university sustainability practices has a negative effect on students' competency in sustainable development. Since the  $p$ -value of  $0.195$  exceeds the accepted alpha value of  $0.05$ , the null hypothesis is retained, and the alternative hypothesis is rejected. Therefore, the results show that there is a negative and non-significant effect of university sustainability practices on students' CESD.

From the findings, a number of students opine that to raise awareness about environmental degradation, students need to join environmental clubs and participate in



environmental programs organized by external stakeholders. However, the majority of opportunities available do not provide the necessary means to develop the full range of skills that students need to promote environmental sustainability. Few university managers actively promote environmental awareness, which affects the degree to which students engage in environmental initiatives.

The results also show that there is no evidence of recycling efforts, and sanitation measures are treated merely as waste disposal within the campus. The training that many students acquire contributes significantly to campus-related environmental actions but is not reflected in actions outside the university.

Nevertheless, the findings suggest that university managers have been working in specific fields of study, focusing on particular skills while restricting knowledge of sustainable development to those fields. On the other hand, the availability of potable water for students in the university remains unclear, leading to the assumption that the managers' actions contradict students' expectations. This aligns with the theory of social constructivism, which states that students learn by interacting with their environment. Consequently, this could contribute to students' incompetence in sustainable development practices.

This phenomenon within the university is temporary, largely due to energy supply shortages. However, electricity supply is constant. Ensuring a stable energy supply creates a certain level of awareness regarding the importance and necessity of energy for daily activities. Thus, sustainability practices exhibited by university managers are likely to be adopted by students. These practices can also be reinforced at home by external stakeholders, such as parents, if top managers make sufficient efforts to raise awareness. For example, students can be encouraged to conserve energy by switching off light bulbs when not in use or unplugging electrical appliances such as chargers.

Just as blood is vital to the human body, energy is essential for electrical appliances in companies and even classrooms. Therefore, a steady and consistent energy supply, including renewable sources such as solar, wind, and geothermal energy, is necessary to sustain industrial and academic activities. The type and quality of energy utilized by the university can influence students' awareness and their preferences for energy sources in future enterprises.



This concept aligns with new product development strategies: for students to be creative and innovative, university managers must also exhibit innovation in their academic approaches. By developing innovative programs, university managers can support wealth creation by exposing students to curricular experiences that foster the identification and development of green products.

#### **5.1.4. Analysis on the effect of university sustainability knowledge on students' competency in education for sustainable development.**

Overall, the analysis of this sub-variable showed that the university possesses knowledge about good sources of drinking water, electricity, and environmental protection programs. However, it has limited knowledge concerning waste management and the effects of climate change in the city.

The analysis indicates that university sustainability knowledge alone has a positive effect on students' competency in sustainable development at the University of Yaounde 1. However, evaluating the combined effect will determine its overall applicability. Looking at the results of inferential statistics for USK, the findings reveal a standardized beta coefficient ( $B = 0.254 < 1.65$ ) and a t-value ( $t = 3.362$ ). The beta value (3.362) is greater than 1.65, with a significance value of 0.001, which is less than the alpha value of 0.05.

Thus, the alternative hypothesis, which states that there is a significant effect of university sustainability knowledge on students' competency for sustainable development, is accepted. Since the p-value of 0.001 is less than the accepted alpha value of 0.05, the null hypothesis is rejected. The results indicate a statistically significant effect of university sustainability knowledge on students' CESD. Hence, university sustainability knowledge significantly enhances students' CESD when combined with other factors.

To effectively discuss the effect of university sustainability knowledge, it is essential to establish the connection between managerial competencies and students' capabilities. Understanding the link between university managers' knowledge and students' learning requires a conceptual framework that explains the multi-dimensionality of learning and competence development within an organization.



According to Gluch et al. (2009), university managers' ability to explain how students learn and organize knowledge is influenced by both internal and external organizational processes. This indicates that students can learn from their managers by developing connections with their managerial competencies. Managers, in their search for value, develop competencies that shape their attitudes and behaviors. These skills, in turn, are observed and replicated by students.

#### **5.1.5. Analysis on the effect of university sustainability management strategy on students' competency in education for sustainable development**

Overall, the analysis reveals that the majority agree that student governing bodies are consulted to address the difficulties students face in studying sustainability concepts. Additionally, community leaders collaborate with university administrators to improve the quality of sustainability programs. However, respondents disagreed that the university's common understanding of sustainability is reflected in interdisciplinary and transdisciplinary programs. As a result, the university struggles to produce regular sustainability reports for accountability.

Based on a linear analysis conducted on university sustainability management strategy (USMS), the findings indicate that USMS is a positive predictor of students' competency for sustainable development at the University of Yaounde 1. This suggests that a well-implemented USMS contributes to improving students' competency.

However, the findings also highlight that sustainability reporting is implemented inconsistently, with only a few departments adopting this strategy. Consequently, only a limited number of students obtain sustainability-related certifications.

The analysis also suggests that interdisciplinary, transdisciplinary, and cross-curricular approaches are employed at the university. These strategies are widely adopted by institutions such as the University of British Columbia and UNITAR to enhance sustainability skills.

The analysis also shows that, through community elites, leaders participate and collaborate with university administrators to improve the quality of students' competencies.



Research conducted by Verkerk et al. (2001) on the democratic approach to management demonstrates that participatory processes involving managers have two positive impacts on the implementation of ethical programs.

First, the democratic approach leads to the internalization of ethical values by managers. Managers develop ethical values for themselves and strive for continuous improvement, viewing legal regulations as standards to be surpassed (Verkerk et al., 2001, p. 375). Secondly, the approach leads to the contextualization of ethical norms by managers, meaning that corporate norms are elaborated in the context of each manager's workplace so that their limitations can be better understood.

#### **5.1.6. Discussion on the analysis of the effect of sustainable university governance on students' competency in education for sustainable development in the University of Yaounde 1.**

The analysis revealed a significant effect of sustainable university governance on students' competency for sustainable development. Moreover, it indicated that factors such as university sustainability policies, knowledge, and management strategies are used to enhance students' competencies at the university, whereas factors such as university sustainability culture and practices are either neglected or not effectively implemented.

However, the lack of appropriate sustainable development policies and designated sustainability officers remains an obstacle to the effective governance of sustainability at the university. Based on the results, we believe that implementing adequate policies and programs is fundamental to integrating sustainability principles, values, and norms within the university framework.

Applying the absorptive capacity model proposed by Zara and George (2002) effectively demonstrates that universities can establish dedicated sustainability offices or committees to oversee the integration of education for sustainable development. These entities can work closely with faculty, students, and external partners to ensure the successful implementation of sustainability initiatives. Furthermore, continuous evaluation and feedback mechanisms should be put in place to assess the effectiveness of the programs and implement necessary adjustments.



Understanding the appropriate principles to address sustainable development issues within university guidelines will enable the design of effective action plans for student development programs. According to a study conducted by Filho et al. (2021) on the seven critical dimensions of sustainability, Liverpool John Moores University has demonstrated resilience through its comprehensive approach to reducing its ecological footprint. This achievement is largely attributed to the university's internal policies, which are essential for successful sustainable development.

For example, JMU's mission statements reflect a strong commitment to sustainability. Additionally, sustainability officers consistently issue political statements in support of sustainability practices and culture. These statements, made by environmental officers and curriculum greening officers, influence how sustainability is integrated into university policy and culture.

Overall, numerous students from the University of Yaounde I have supported the university's approach by investing in institutional practices that promote sustainability awareness and environmental action for sustainable development.

From the standpoint of this research, it is evident that university sustainability culture is not effectively implemented. Consequently, fundamental sustainability principles such as peace, justice, fairness, and transparency are minimized in the university's day-to-day operations, despite claims of their existence. This deficiency has hindered many students from developing their competencies in peace, justice, and human rights.

According to Bandura's social learning theory (1977), individuals learn from interactions within a social context through observation, assimilation, and imitation of behaviors, particularly when the experiences are positive or associated with rewards. Applying this theory to the university context suggests that students are likely to replicate the ways in which university managers handle issues of injustice, human rights, and gender inequality. As a result, the competencies the university seeks to enhance are directly influenced by its culture and underlying values.



From Bandura's perspective, if environmental sustainability is ingrained in the university culture, students will adopt similar sustainability practices, which will be reflected in their community participation. This implies that managers' sustainability culture directly influences students' sustainability competency.

According to Max's perspective on social constructivism, a university's impact on the community and the environment defines its sustainability culture (Adam et al., 2018). This includes proper waste disposal practices to reduce pollution within the institution and its surroundings, the provision of potable water, and the sustainable resolution of conflicts between students, faculty, and administrators. Such initiatives significantly enhance students' skills in sustainable development.

However, when these sustainability values are not exhibited within the university environment, students develop a limited understanding of sustainability issues, which negatively impacts their perception and response to such challenges.

By applying the absorptive capacity model and Bandura's social learning theory to Sustainable University Governance, students' competency in education for sustainable development can be significantly enhanced. These models highlight the university's unique opportunity to equip students with the knowledge, skills, and mindset necessary to address future environmental, social, and economic challenges.

Additionally, universities that prioritize economic sustainability integrate sustainability into students' daily lives and establish it as a criterion for personal and professional development. Participation in green business initiatives and sustainable purchasing practices are fundamental aspects of fostering future sustainability attitudes among students (Yafi et al., 2021). However, such practices are neither consistent nor efficient across the different faculties of the University of Yaounde I, whereas students in private universities in the country regard sustainability culture as highly significant.

Furthermore, an in-depth analysis of the effects of university sustainability practices reveals that the university does not efficiently implement sustainability strategies. The findings indicate that managers' attitudes towards economic sustainability do not significantly impact



students' competencies. This suggests that students trained in sustainability do not actively engage in raising awareness about innovative ideas for business growth and development.

However, the effect of university sustainability knowledge on students' competencies yields positive and convergent results. Nevertheless, a lack of knowledge does not imply a complete absence of awareness. The results indicate that while the university possesses a strong theoretical understanding of climate change, this knowledge is not sufficiently integrated into its programs to enhance students' competencies in sustainability. Only students from specific disciplines benefit from such concepts.

The extent to which students participate in environmental and sustainability programs reflects these shortcomings. For instance, issues such as waste management and transformation, which are highly visible and alarming in urban areas, are only addressed within specific disciplines. However, only a few students who acquire key competencies through a combination of academic and professional courses are capable of providing practical solutions to these challenges.

Additionally, only a limited number of fields, such as geography, specialize in this area at the University of Yaounde I. While the university aims to develop sustainability-related sectors, its approach remains limited to cognitive skills due to a lack of expertise in instrumental competencies and practical sustainability skills, such as waste transformation and recycling.

This limitation reduces the university's potential to develop comprehensive sustainability competencies among its students. Although research on sustainability issues is conducted within the university, the knowledge and competencies acquired are not effectively utilized by the community and society.

For example, initiatives such as the adoption of renewable energy sources, waste recycling programs, and sustainability-related workshops or academic exchange programs enable students to develop their knowledge, attitudes, and behaviors toward environmental, economic, and social sustainability.



Finally, the results indicate a significant positive effect of university sustainability management strategies on students' competencies. These findings align with Gluch et al. (2009), who argue that absorptive capacity links externally acquired knowledge to internally generated knowledge, illustrating how students integrate external knowledge and transform it into organizational capabilities.

Thus, effective sustainability strategies and knowledge implemented by university managers can significantly enhance students' competencies across the three faculties of the University of Yaounde I.

## **5.2. Conclusion of discussion**

Therefore, the discussion of the results shows that sustainable university governance (Sustainable University Governance), conceptualized as “university sustainability politics (USP), university sustainability culture (USC), university sustainability practice (USPs), university sustainability knowledge (USK), and university sustainability management strategy (USMs),” as the overall independent variable, has a significant effect on students' competency in education for sustainable development in the university. The findings indicate that sustainability governance mechanisms are present but are being utilized unconsciously to some extent in specific faculties and disciplines, such as chemistry, education management, and biology. Though the impact is minimal, it could be maximized if certain factors, such as university sustainability politics, practices, and university sustainability culture, were introduced into the mechanism. This explains why only 75.8% accounts for the variability in students' competency in education for sustainable development at the University of Yaounde I.

Analyzing each sub-variable, beginning with university sustainability politics (USP), reveals that sustainable development policies, action plans, and sustainability officers are lacking. However, some faculties make effective use of sustainable development programs and action plans unconsciously to enhance students' competence in sustainable development in certain disciplines, but not across all faculties. Additionally, knowledge of this concept is limited among university managers, as only a few students create awareness about sustainable development. This explains why university sustainability politics accounts for only 16.2% of the variability in students' competency in education for sustainable development.



Similarly, the discussion on USC demonstrates that university managers do not actively cultivate students' competences in peacebuilding, social justice, and human rights. Moreover, they do not promote economic sustainability in disciplines that could contribute to sustainable development. Since students fail to engage in programs that support peacebuilding and environmental protection, it suggests that managers are not effectively transmitting such skills. A university's culture significantly impacts its surroundings, either directly or indirectly, when practiced. For example, the concept of "living together" could be transmitted by organizing activities that unite different student groups. The lack of such initiatives explains why university sustainability culture accounts for only 12.4% of the variability in students' competency in education for sustainable development.

Similarly, analyzing university sustainability practices (USPs) reveals that some managers fail to create environmental awareness in their daily practices, which is proportional to students' understanding. The results indicate that there is no evidence of recycling efforts, but there are sanitation measures, such as the availability of trashcans for waste disposal on campus. Moreover, although many students receive training that contributes to sustainability on campus, it does not translate into similar practices outside the university. University managers have emphasized certain sustainability skills within specific disciplines, yet environmental sustainability knowledge remains restricted to geography and geology students, whereas environmental preservation encompasses broader ecological concerns.

For instance, in a chemistry laboratory, if hazardous waste such as chlorine and bromine is not properly disposed of after practical sessions, students will not develop the appropriate waste management skills. Similarly, in biology practical sessions, students often neglect environmental protection measures. For example, improper disposal of syringes and plastic materials can contribute to pollution. A weak sustainability culture results in poor sustainability practices.

This explains the insignificant effect of university sustainability practices on students' competency in education for sustainable development (CESD), accounting for 16.4% of the variability in competency at the University of Yaounde 1.



Furthermore, the discussion on USK indicates that university sustainability knowledge has a significant effect on students' competency in sustainable development at the University of Yaounde 1. The analysis reveals that the university possesses knowledge on topics such as access to clean drinking water, electricity, and environmental protection programs. However, there is limited awareness regarding waste management and climate change effects within the city. This accounts for 59.3% of the variability in students' competency in education for sustainable development at the University of Yaounde 1.

**The analysis of USMs reveals that student governing bodies are consulted to understand the challenges students face in learning sustainability concepts. Additionally, the local community, through elite leaders, collaborates with university administrators to enhance the quality of sustainability programs. However, the university's collective understanding of sustainability is not reflected in interdisciplinary and transdisciplinary programs. Consequently, the university struggles to produce regular sustainability reports for accountability. This explains why university sustainability management strategy accounts for 46.6% of the variability in students' competency in education for sustainable development at the University of Yaounde 1.**

### **5.3. Difficulties Encountered during the research process**

Conducting this research was not without challenges.

*According to alexander, "to err is human, to forgive is divine." We know in part, and daily we learn to improve our cognitive abilities as humans.*

The first major challenge was documentation. It was difficult to find research specifically focused on students' competency in education for sustainable development at the university level. Only a limited number of documents related to competency and sustainable development were available online. Moreover, finding studies analyzing university governance with the aim of integrating sustainable development principles into governance mechanisms was equally challenging. The lack of online resources on the University of Yaounde 1 significantly hinders research that could improve its governance system.



The second challenge was data collection. Many students submitted incomplete questionnaires, often due to unjustified suspicion.

The COVID-19 pandemic also posed a significant obstacle. The national and international lockdowns during data collection made progress difficult. Although we adopted an online strategy to distribute questionnaires, many students were uncomfortable with the method. Additionally, internet connectivity issues further complicated the process, forcing us to revert to physical questionnaire distribution to complete data collection.

Furthermore, the sociopolitical crisis in Cameroon was another challenge. The ongoing crisis left many individuals in a psychologically distressed state, making it difficult to conduct interviews.



## **GENERAL CONCLUSION**



#### 5.4. General conclusion

This research began with an idea that there exist a gap between sustainable university governance and the types of competency needed by students in their professional lives for the resolution of real world problems encountered in the social, economic, and environmental dimensions of sustainable development. The research through key observations intended to show that students' competency in education for sustainable development seems to be justified by the type of university governance used and seeks to enhance the competencies of future actors of sustainable development in the University of Yaounde 1. Through main and specific research questions, objectives, and hypotheses, the researcher analyzed the extent to which sustainable university governance enhances students' CESD at the University of Yaounde 1. That is, the researcher evaluated the extent to which university sustainability politics, culture, practice, knowledge, and management strategy enhance students' competency in education for sustainable development in the University of Yaounde 1. The specific objectives aimed to analyze the extent to which university sustainability politics, culture, practice, knowledge, and management strategy enhance students' competency in education for sustainable development in the University of Yaounde 1. To provide evidence for the research, two analyses were performed: a multivariate and a linear regression analysis to test the null hypotheses. The results of the multivariate analysis were as follows:

For university sustainability politics: a p-value of  $0.270 > 0.05$  was obtained, which indicates that there is no significant effect of university sustainability politics on students' competency for sustainable development in the University of Yaounde 1. The result is justified by a 16.2% variability in CESD caused by USP.

For university sustainability culture: a p-value of  $0.053 > 0.05$  was obtained, indicating no significant effect of university sustainability culture on students' competence for sustainable development in the University of Yaounde 1. This result is also justified by a 12.4% variability in CESD caused by USC.

For university sustainability practice: a p-value of  $0.085 > 0.05$  was obtained, indicating that there is no significant effect of university sustainability practice on students' competency for sustainable development in the University of Yaounde 1. This result is also justified by a 16.4% change in CESD caused by USPs.



For university sustainability knowledge: a p-value of  $0.001 < 0.05$  was obtained, indicating a significant positive effect of university sustainability knowledge on students' competency for sustainable development in the University of Yaounde 1. This result is also justified by a 59.3% variability in CESD caused by USK.

For university sustainability management strategy: a p-value of  $0.00 < 0.05$  was obtained, indicating a significant positive effect on students' competency for sustainable development in the University of Yaounde 1. This result is also justified by a 12.4% variability in CESD caused by USMs.

These results did not permit the validation of the main null hypothesis since three specific null hypotheses were retained, and two were rejected. Therefore, a linear regression analysis was conducted, and the results were as follows:

For Sustainable University Governance, a p-value of  $0.00 < 0.05$  was obtained. This indicates that there is an effect of sustainable university governance on students' competency for sustainable development in the University of Yaounde 1. This result is also justified by a 78.5% variability in CESD caused by USG. The result also indicates that students' competency in the University of Yaounde 1 was enhanced by 78.5%.

From the analysis results, we conclude that sustainable university governance significantly affects students' competency. Thus, it is the best type of governance to integrate sustainability into the university framework to enhance students' competency in education for sustainable development.

#### **5.4.1. Implications of the Study**

Having discussed this study's findings in relation to existing literature, this section outlines the implication of these findings for future research. The section also identifies the limitations of this study and concludes with closing reflections on the systemic changes needed for sustainability in the university more generally and how university managers can train competency.



### 5.4.2. Implications for Future Research

Findings from this study revealed the responsibility of university manager concerning sustainable development across the universities from science to humanities. What is clear is that university sustainability culture and sustainability politics, and practice is crucial to realizing systemic, critical thinking and problem-solving competency for sustainable development in the university.

- Future research could examine how students' sustainability competency is involve at the industry. This research could enhance the understanding of how students' involvement in sustainability affects their lives in the industry and society.
- How students' government create awareness and make use of sustainability to influence the direction that most students takes might help direct their attentions toward sustainable development.
- Encompassing this study's findings on the medical field would benefit from more in-depth research. The research could contribute to an understanding of how professionals such as medical students and engineering students support sustainable development.
- In addition, other studies could focus on how medical students create awareness on environmental factors that mars sustainable development and how they focus on social justice issues in relation to sustainability.



## **5.5. Recommendations**

### **5.5.1. General recommendation to the ministry of higher education**

Educating for sustainability between 2025-2035 will ensure that all learners acquire knowledge and skills needed to promote sustainable development. Through education for sustainable development, graduates of most public universities in Cameroon will be able to practice sustainable lifestyles, human rights, gender equality, and the promotion of a culture of peace and non-violence. They will become global citizens and will be able to appreciate cultural and biodiversity, reducing pollution to mitigate climate change.

From the standpoint of this research, we suggest that the Ministry design policies that favor the development of sustainability skills in universities.

The government should ensure that the recruitment of university staff takes into consideration sustainability skills by appointing sustainability officers. In this way, university governance mechanisms will aid administrators and lecturers in implementing measures to ensure that sustainability is effectively integrated into the curriculum.

### **5.5.2. Recommendation to University Institutions**

#### **5.5.2.1. For university sustainability politics**

The university should increase its implementation of USPs by 73.8%. That is, the university should establish a sustainable development policy and action plan with vice-chancellors or vice-rectors acting as sustainability officers to address sustainability issues within the institution. This will greatly help governance mechanisms enhance students' competencies in sustainable development.

The promotion of sustainable development is a key factor in advancing the quality and relevance of competencies and skills. This depends on clear internal policies and strategies formulated in a holistic and systematic way by university managers to train students effectively. Thus, university managers should develop comprehensive and appropriate sustainable development policies and action plans that incorporate sustainability programs. Collaboration among different departments on sustainability initiatives should be encouraged to facilitate the effective implementation of sustainability programs.



### **5.5.2.2. For university sustainability culture**

The university should increase its adoption of USC by 87.6% by integrating economic sustainability principles and tracking progress in new sustainable initiatives. We recommend that the university engage in activities that involve students in innovative practices that support sustainable economic growth. By implementing this approach, the university will be able to strengthen its commitment to economic sustainability.

### **5.5.2.3. For university sustainability practices strategy management**

The university should increase its implementation of USPs by 1.2%. We also recommend that the university develop greater knowledge on environmental issues (such as climate change), as the overall success of sustainable development depends on strengthening the curriculum and pedagogical strategies.

We recommend that the university develop strong partnerships with UNICEF, UNESCO, UNITAR, and the Red Cross to enhance professionalization efforts.

A sustainability governance model should be adopted to ensure effective leadership and governance in promoting competency for sustainable development. Additionally, leadership is a critical determinant of success, requiring power to be distributed equally across departments to ensure the effective training of CESD.

Governance mechanisms should establish a system of transparency and accountability through sustainability reporting. University staff should adopt a holistic, interdisciplinary, and transdisciplinary approach to train students in systemic, critical, and problem-solving skills. Training methods such as on-the-job and off-the-job techniques should be utilized. Additionally, vestibule training methods could be employed to develop competencies in sustainable development.



## 5.6. Recommendations to students

Students should participate in environmental programs organized by the university, UNESCO, the World Bank, UNICEF, UNITAR, and the university itself.

### 5.6.1. Recommendations for Further research

Researchers could focus on the following competencies for students and teachers:

- Anticipatory competency
- Normative competency
- Strategic competency

A similar study could be conducted using a mixed-methods approach. Additionally, a comparative study could be undertaken to analyze sustainable university governance in private universities, as they are managed differently from public institutions.

### 5.6.2. Research Limitations

This study aimed to gather comparable data across eleven state universities in Cameroon. However, limitations in time, financial resources, and project scope restricted the possibility of conducting research in additional areas of interest. Particularly, it was not possible to carry out research in several universities due to financial constraints.

In addition, the distinction between policy and practice in sustainable university governance posed challenges for some administrators, making the research difficult to execute.

## 5.7. Suggestions

To develop contextualized competency for sustainable development at the University of Yaounde 1, the university needs to improve its university sustainability politics, culture, and practices to build sound knowledge for sustainable development and to develop an effective sustainability managers' strategy to foster sustainable development.

### ❖ University sustainability policies

Good and effective sustainability politics enable the development of adequate sustainable policies, action plans, and programs for sustainable development at the university. This facilitates the interaction between the administrative organs of the university system and other partners, such as UNICEF, the World Bank, and UNESCO, making sustainable



development programs legitimate and acceptable, thereby fostering training and enhancing students' capacities to promote sustainable development. Thus, our suggestion in this area will enable the governance team, managers, and professionals to adopt new approaches to raise awareness and foster sustainable development in various universities across Africa.

#### ❖ **Enhancing the governance team**

Universities should introduce a system of shared sustainability governance, which allows sustainability officers to participate in decision making regarding the choice of competency and to attain positions through legitimate means. This will facilitate the development of sustainable development (ESD) competency in every faculty and discipline. Such legitimacy minimizes role confusion and conflicts between the council and executive management regarding the key competencies to be trained for sustainable development.

#### ❖ **Strengthening existing managers with sustainable development concepts**

Strengthening the role of university management with established concepts such as equality and equity will help implement sustainability policies and programs—such as sustainable development initiatives—to address sustainability challenges. This can be achieved by enriching central institutional units, such as the university executive committee for sustainable development, with sustainability officers to help strengthen processes, mission statements, and guidelines.

#### ❖ **University sustainability culture**

University sustainability culture should be incorporated as a mechanism for sustainable university governance through sustainability reporting, teaching, and learning. This strategy ensures that decision-making processes systematically plan for a shared understanding of sustainability in interdisciplinary and transdisciplinary contexts through teaching, learning, and collaboration with elite leaders in society, thereby enhancing competency—especially in ESD—via student governing bodies, course lessons, and developmental activities. Competency for ESD can be reinforced without incurring high costs or abandoning the existing teacher development system.



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**GLOSSARY**

## Research authorization

<p>FACULTÉ DES SCIENCES DE L'ÉDUCATION ***** CENTRE DE RECHERCHE ET DE FORMATION DOCTORALE EN SCIENCES HUMAINES, SOCIALES ET ÉDUCATIVES ***** UNITÉ DE RECHERCHE ET DE FORMATION DOCTORALE EN SCIENCES DE L'ÉDUCATION ET INGÉNIERIE ÉDUCATIVE ***** DÉPARTEMENT D'ÉDUCATION SPÉCIALISÉE</p>		<p>THE FACULTY OF EDUCATION ***** POSTGRADUATE SCHOOL FOR HUMAN, SOCIAL AND EDUCATIONAL SCIENCES ***** DOCTORAL UNIT OF RESEARCH AND TRAINING IN SCIENCE OF CURRICULUM AND EDUCATIONAL ENGINEERING ***** DEPARTMENT OF SPECIALIZED EDUCATION *****</p>
<p>Le Doyen The Dean N°. <u>005</u>/22/UYI/VDSSE</p>		
<h3><u>ATTESTATION DE RECHERCHE</u></h3>		
<p>Je soussigné (e), Professeur BELA Cyrille Bienvenu, Doyen de la Faculté des Sciences de l'Éducation de l'Université de Yaoundé I, certifie que l'étudiant NGOWA SOKPA Giresse Matricule 17T3001 est inscrit en Doctorat/Ph.D à la Faculté de l'Éducation. Département : <i>CURRICULA ET EVALUATION</i>, filière : <i>MANAGEMENT DE L'ÉDUCATION</i>, Option : <i>ADMINISTRATION SCOLAIRE</i>.</p>		
<p>L'intéressée doit effectuer des travaux de recherche en vue de la préparation de son diplôme de Doctorat/Ph.D. IL travaille sous la direction de Pr. NJENGOUE NGAMALEU Rodrigue. Son sujet est intitulé : « The impact of Sustainability skills on Graduate's employability in Cameroon ».</p>		
<p>Je vous saurai gré de bien vouloir lui recevoir et mettre à sa disposition toutes les informations susceptibles de l'aider à conduire ses travaux de recherches.</p>		
<p>En foi de quoi, cette attestation de recherche lui est délivrée pour servir et valoir ce que de droit /.</p>		
<p>Fait à Yaoundé, le <u>10 JAN 2022</u></p>		
<p>Pour le Doyen et par ordre</p>		
		



## **Definition of terms and summary of theories**

**Sustainability governance** refers to the processes, policies and procedures implemented by organizations to ensure that their operations prioritize sustainable development. It involves the integration of environmental, social and economic considerations into decision making processes to promote lasting, positive outcomes for individuals, society and the planet. Effective sustainability governance requires a commitment at all levels of an organization, from senior management to front-line staff. It involves establishing goals, targets and performance indicators that align with environmental and social benchmarks, and monitoring progress towards achieving those objectives. Sustainability governance also entails engaging stakeholders in the decision-making process. This includes collaborating with community members, customers, employees and suppliers to understand their environmental and social concerns, and incorporating their feedback into sustainability strategies. In addition, sustainability governance requires transparency and accountability. Organizations must communicate openly about their sustainability priorities, progress and challenges, and be willing to receive feedback and input from stakeholders. This helps create a culture of continuous improvement and drives innovation towards sustainable practices. Overall, sustainability governance is a critical component of organizational success in the twenty-first century. As the world becomes more interconnected and global challenges such as climate change, resource depletion and social inequality become more urgent, organizations that prioritize sustainability will be better positioned to thrive in the long term.

### **Sustainable University Governance.**

Sustainable university governance refers to the strategies, policies, procedures, and programs that promote sustainable practices in higher education institutions.

*For the purpose of this research it refers to the politics, culture, practice, knowledge and management strategy use to promote sustainable development within the university.*

The governance structure typically involves multiple levels of decision-making, including at the institutional level, departments, faculties, and individual staff and students.

Sustainability governance can involve a range of approaches, such as:

- Establishing a sustainability committee or officer responsible for overseeing sustainability initiatives across the institution.



- Developing a sustainability policy that outlines the university's commitment to sustainability and sets targets for reducing its environmental impact.
- Conducting sustainability audits to identify areas where the institution can improve its environmental performance and reduce its carbon footprint.
- Offering sustainability training and education programs to staff, students, and the wider community.
- Creating partnerships with local businesses, governments, and community organizations to promote sustainable practices and drive change.

Effective sustainability governance can help universities achieve their sustainability goals, reduce costs, and improve community engagement. It can also help universities stay relevant in an era where environmental issues are becoming increasingly important to students, faculty, and the wider community.

**Sustainability politics** have gained prominence in recent years as the need to address environmental issues has become increasingly urgent. As a result, governments and organizations worldwide have implemented measures and policies to promote sustainable development. At its core, sustainability politics aim to ensure that economic growth, social development, and environmental stewardship work together in a balanced and integrated manner. This often involves taking a long-term perspective and making decisions that prioritize the well-being of future generations. One key aspect of sustainability politics is the promotion of renewable energy and the reduction of greenhouse gas emissions. This involves investing in clean technologies such as solar and wind power, as well as imposing regulations and incentives to encourage the use of these technologies. In addition to energy, sustainability politics also focus on sustainable consumption and production practices. This may involve promoting the use of eco-friendly products and encouraging recycling and waste reduction. Furthermore, sustainability politics often prioritize the protection and conservation of natural resources, such as forests and oceans, to maintain their ecological integrity and provide for future generations. Overall, sustainability politics seek to balance economic growth with environmental responsibility and social equity to create a more sustainable future for all.

**University sustainability politics**, however aims to achieve a sustainable future by incorporating social, environmental, and economic factors in their decision-making processes.



Universities are taking measures to reduce their carbon footprint, promote sustainable development, and support the local community. They are also educating their students on sustainability issues and promoting innovative research to develop sustainable solutions to environmental challenges. University sustainability politics are an essential element of the global sustainable development agenda, as universities have a critical role to play in advancing sustainable development.

**Sustainability culture** refers to a collective set of behaviors, values, and beliefs that prioritize actions aimed at preserving the natural environment, promoting social equity and economic prosperity. It is a culture that strives to promote responsible and ethical practices that ensure the well-being of the current and future generations.

**University sustainability culture** refers to the overall attitudes, beliefs, and behaviors that promote environmental sustainability within an academic community. This involves creating a culture that values and prioritizes sustainability initiatives, such as reducing waste, increasing energy efficiency, and promoting sustainable transportation.

University sustainability culture include various initiatives and programs, such as:

- Sustainable practices in buildings and operations, including green buildings, energy-efficient buildings, and alternative energy use.
- Sustainable transportation programs such as bike share and carpooling, as well as public transportation discounts and incentives.
- Sustainable waste reduction programs that focus on recycling, composting and waste reduction campaigns.
- Curriculum integration of sustainability themes across various disciplines- political science, management, engineering.
- Community engagement and outreach initiatives that focus on sustainable lifestyle changes and promoting sustainability ethos among stakeholders.

A strong sustainability culture in universities can help to inspire and educate future generations on environmental responsibility and help bring about global change in managing climate crisis. Sustainability culture acknowledges the need for a shift toward a more sustainable way of living, where resources are used efficiently, waste is minimized, and the impact on the



environment is significantly reduced. This culture recognizes that the health of the planet and its ecosystems is crucial to our survival and well-being. Sustainable culture requires collaboration and participation from all members of society. It involves active engagement in promoting sustainable practices, such as reducing energy consumption, promoting sustainable food production and consumption, reducing waste, and adopting eco-friendly transport practices. Moreover, sustainability culture includes ethical practices that promote social equity and economic prosperity. It is a culture that values diversity, promotes fair labor practices and opportunities for all, and ensures that the benefits of sustainable development are equitably distributed. In conclusion, sustainability culture is a fundamental shift in the way we approach and value our interactions with the environment, society, and the economy. It requires a commitment to responsible and ethical practices that consider the natural systems and human well-being. As we work toward a more sustainable culture, we must acknowledge that it is not just a buzzword, but a fundamental shift in our way of thinking and acting, to secure a better future for ourselves and generations to come.

**University sustainability practice** refers to the measures and initiatives implemented by universities to minimize negative environmental impacts and promote social and economic development. Such practices are aimed at creating a sustainable and resilient campus community that can provide a quality learning environment for students.

University sustainability practices include:

- Green campus design and construction: Designing and constructing sustainable campus buildings that meet energy efficiency and environmental standards.
- Energy efficiency: Reducing energy consumption through installation of LED lights, solar panels, and other energy-efficient equipment.
- Sustainable transportation: Encouraging the use of public transport, walking, biking, and electric vehicles. Providing bike storage facilities and promoting carpooling among staff and students.
- Resource management: Conserving water and reducing waste by implementing recycling programs, composting, and reducing the use of single-use plastics.
- Sustainable procurement: Encouraging the purchase of environmentally friendly and socially responsible products and services



- Sustainability education: Integrating sustainability into the curriculum, offering courses and programs on sustainable development, climate change, and environmental sciences.
- Community engagement: Collaborating with the local community and other stakeholders to promote sustainable practices beyond the university.

Overall, university sustainability practice plays a vital role in promoting sustainable development locally and globally, enhancing the reputation of higher education institutions, and preparing students to be responsible global citizens.

### **University sustainability knowledge:**

- Sustainable development principles: Universities must understand the sustainable development principles and integrate them into their operations and teachings. This involves the balance between economic development, social wellbeing, and environmental protection.
- Green policies: Universities must implement green policies to reduce their carbon footprint. They include reducing emissions, power consumption, and waste management.
- Sustainability education: Universities must teach sustainability to students and staff. This includes having sustainability curriculums, research, and teaching labs. Offer sustainability certification, produce regularly sustainability reports ensures that university common understanding of sustainability is reflected in inter-disciplinary and trans-disciplinary
- The community through elite leaders collaborate with school administration to improve on the quality of educational sustainability
- The students governing body is consulted to know the difficulties students face in studying sustainability concepts.
- Climate action: Universities should be actively involved in climate action. They should undertake research to understand the causes and impacts of climate change and also develop strategies to mitigate and adapt to the changes.



- Community outreach: Universities must engage and collaborate with the community on sustainability issues. This includes working with the local government, industries, and other institutions to address common sustainability challenges.
- Leadership: Sustainability leadership involves providing guidance and direction on sustainability issues. This includes appointing sustainability officers and steering committees to ensure sustainability is taken seriously.

**Sustainability management strategy** for a university includes the following:

- Set sustainability goals: Identify areas of the university where sustainability needs to be improved and set achievable goals to improve sustainability in those areas. The goals should align with global sustainability goals like UN Sustainable Development Goals (SDGs) and should be measurable.
- Create a sustainability committee: A sustainability committee should be formed with representatives from various departments across the university, including students, faculty, and staff. The committee should be responsible for developing and implementing sustainability strategies and initiatives.
- Conduct a sustainability audit: Conduct a sustainability audit of the university to identify areas where it can improve its sustainability practices. This audit will help in highlighting the areas that require attention in order to achieve sustainability goals.
- Improve energy efficiency: Energy consumption is one of the major sources of greenhouse gas emissions. The university can reduce carbon footprint by improving energy efficiency through building retrofits, installation of energy-efficient equipment and encouraging renewable energy use.
- Implement sustainable waste management: Implement a sustainable waste management system wherein the university can reduce waste production, conduct proper sorting and separation of wastes, and divert waste away from landfills through recycling, composting, and other means.
- Promote sustainable transportation: The university can encourage low carbon transportation options such as biking, walking, carpooling or the use of electric vehicles to reduce emissions from transportation.



- Establish sustainable purchasing practices: The university can adopt eco-friendly purchasing policies that select environmentally and socially responsible products.
- Introduce sustainability education: The university can develop sustainability-related education programs and courses to raise awareness among students, faculty, and staff about sustainability issues, thereby driving behavior change toward a more sustainable campus.
- Monitor and report progress: Tracking progress towards sustainability goals is essential to ensure that the strategy and initiatives are effective. Frequent monitoring and reporting of progress will help identify areas requiring further attention and keep stakeholders informed about sustainability practices on campus.

Overall, a university sustainability management strategy should aim to integrate sustainability into all aspects of campus operations, drive behavior change, and create a culture of sustainability on campus.

### **Students' competence for sustainable development**

Students' competence for sustainable development involves the knowledge, skills, attitudes, and values necessary to understand and contribute to sustainable development. This competency relates to the ability to analyze and address sustainability challenges in an interdisciplinary manner, utilizing knowledge from different fields.

The following are some of the competencies that students should possess for sustainable development:

**Understanding of sustainability:** Students should have a clear understanding of the concepts of sustainable development, including the social, economic, and environmental aspects. They should comprehend the principles of sustainability and how to apply them in real-life situations.

- **Critical thinking:** The application of logical principles, rigorous standards of evidence, and careful reasoning to the analysis and discussion of claims, beliefs, and issues. Students should be able to critically analyze sustainability problems and find solutions utilizing a systemic approach.



- **Systems thinking:** Sustainability deals with a complex, interconnected system. Students need to think broadly, understanding the interdependencies within ecosystems and society.
- **Problem-solving:** there are thought processes involved in solving a problem. It can also be seen as the area of cognitive psychology that studies the processes involved in solving problems. Students should possess problem-solving skills that help them identify and suggest possible solutions to sustainability challenges.
- **Collaboration:** Sustainable development requires teamwork. Students need to be adept at working with others and building relationships necessary to tackle complex and interrelated sustainability problems.
- **Communication:** Students should be able to communicate complex sustainability concepts to diverse audiences. Effective communication skills help in sharing knowledge and promoting sustainable development.

In conclusion, students' competence for sustainable development is a critical aspect of integrating sustainability into society. It helps students to become problem solvers, critical thinkers, and active participants in promoting sustainable development.

**Behavior:** human behavior is the way people act in their everyday life. For people producing, distributing or consuming goods and services. It may be difficult to say when or why an individual will behave a certain way like consuming a particular good or services however rational behavior is consider a systematic way that human beings undertake to achieve their desired goals or objectives.

**Attitude:**

**Economics:** According Lionel is a science, which study human behavior in relation to scarce means, and ends, which alternate, has whereas **economy** is the institutional structure made up of set of rules and regulations through which economy agents coordinate economy activities in order to satisfy human wants or place where economic activities takes place.



## **Summary of Theories**

### **Absorptive capacity perspective**

Absorptive capacity perspective refers to the ability of an organization to acquire, assimilate, and utilize knowledge from external sources to improve its performance and competitiveness. According to this perspective, absorptive capacity is critical for firms to remain competitive in today's knowledge-intensive economy, where the pace of technological change and globalization requires firms to continuously learn and adapt.

The concept of absorptive capacity encompasses various dimensions, including the ability to identify and search for relevant external knowledge, the willingness and ability to absorb and assimilate that knowledge, the ability to transform and combine that knowledge with existing knowledge, and finally, the ability to apply and exploit the new knowledge to create value.

The absorptive capacity perspective suggests that firms with higher absorptive capacity are more likely to identify and exploit new opportunities, respond to technological change more effectively, and generate greater innovation and competitiveness. Therefore, firms need to invest in developing their absorptive capacity continuously, which involves creating organizational structures and processes that promote knowledge sharing, learning, and innovation.

### **Social learning theory**

Social learning theory is a psychological theory that aims to explain how individuals learn through observation, modeling, and imitation of others' behavior, attitudes, and values. This theory emphasizes the importance of social interactions in the learning process, as it assumes that individuals acquire new behaviors by observing and imitating others. In addition, social learning theory suggests that individuals can learn new behaviors indirectly through the influence of media, such as television, film, and internet, that present different social models and role models. According to this theory, social reinforcement and punishment play an essential role in shaping individuals' behavior and determining whether they will imitate certain behaviors. Thus, social learning theory suggests that learning is not only an individual process but also a social and environmental one that is influenced by the social context in which the individual operates.



**Social cognitive theory** is a psychological theory that builds upon the principles of social learning theory. This theory emphasizes the role of cognition, such as attention, memory, and motivation, in the learning process and how individuals actively participate in their learning. Social cognitive theory suggests that individuals not only learn through observation and imitation, but they also anticipate the consequences of their behavior and make decisions based on their beliefs, expectations, and values. Additionally, social cognitive theory proposes that individuals can regulate their behavior by observing and modeling others who possess the desired behavior, which is referred to as self-regulation. Self-regulation entails self-observation, self-evaluation, and self-reaction, which enable individuals to set goals, monitor their progress, and adjust their behavior accordingly. Social cognitive theory also emphasizes the reciprocal interaction between individuals and their environment and how social factors, such as culture and social norms, shape individuals' cognition and behavior. As such, social cognitive theory provides a comprehensive model of learning that considers both the individual and environmental factors that influence behavior.

### **Constructivism theory**

**Constructivism theory** is a learning theory that emphasizes learners' active role in constructing their own understanding of new ideas and concepts. According to this theory, learners are not passive recipients of information but rather actively construct their own knowledge by interacting with their environment and experiences. This means that each person's meaning and understanding of new information are unique to his or her experiences and cultural background. Constructivism recognizes the importance of prior knowledge, context, and culture in learning. Constructivists argue that learners must be able to connect new information to their prior knowledge and experiences to develop a deep understanding. Therefore, it emphasizes the need for authentic, relevant, and meaningful learning experiences that build on learners' knowledge and skills. Constructivist learning occurs in a social context and is characterized by active collaboration among learners with common interests and goals. In constructivism, teachers serve as facilitators rather than sources of information, helping learners to actively engage with the content and to reflect on their learning. This is because constructivists believe that learning is personal and cannot be transferred from one person to another but is rather constructed by each individual based on the unique ways in which they perceive and interpret their experiences. Overall, constructivism is an influential approach to learning that emphasizes the importance of meaningful, authentic, and learner-centered



approaches that recognize the unique role of the individual learner in constructing his or her own understanding.

### **Social constructivism theory**

Social constructivism is a theoretical perspective in education that emphasizes the social and cultural elements involved in the learning process. According to this theory, knowledge is actively constructed and created by learners as they interact with their environment and with others. Social constructivism emphasizes the importance of social interaction, collaboration, and dialogue in the learning process. Learners are encouraged to engage in meaningful activities that challenge their thinking, promote problem-solving skills, and foster creativity. These activities are typically designed to be authentic, relevant, and aligned with learners' interests, culture, and experience. In social constructivism, learners are considered active agents who shape their learning environment and create their own understanding of the world around them. The role of the teacher in social constructivism is to facilitate and support the learning process by creating a safe and respectful learning environment, providing guidance and feedback, and promoting collaboration and reflection. Teachers encourage learners to construct their understanding of the world by asking open-ended questions, promoting dialogue, and providing multiple perspectives. Social constructivism theory is widely applied in education, particularly in the field of pedagogy, where it forms the basis for inquiry-based learning, problem-based learning, and project-based learning.

### **Stakeholder paradigm**

Stakeholder theory is a management philosophy that asserts that a company's success depends on the satisfaction of its stakeholders, which include not only shareholders but also employees, customers, suppliers, and communities where the company operates. According to this theory, a company cannot focus solely on maximizing profits for its shareholders without considering the impact of its actions on all stakeholders. The theory suggests that businesses have a social responsibility to take all stakeholders into account, not just shareholders, and to make decisions that balance the interests of all parties. The stakeholders' needs and opinions should be considered when making decisions related to the company's operations, products, and services. Stakeholder theory outlines four main types of stakeholders: owners (shareholders), customers, employees, and suppliers. However, additional stakeholders may include regulators, governments, special interest groups, and the environment. The theory suggests that a



company's long-term success is dependent on building and maintaining positive relationships with all its stakeholders. By doing so, the company can benefit from increased trust, brand reputation, customer loyalty, and employee satisfaction. There are various ways that companies can use stakeholder theory to shape their policies and practices, such as conducting regular stakeholder engagement, establishing codes of ethics, implementing corporate social responsibility initiatives, and creating transparency in reporting. Overall, stakeholder theory advocates for companies to look beyond short-term profits and consider the long-term implications of their actions on all stakeholders, as this leads to a more sustainable and socially responsible approach to business.

The application of stakeholder theory in sustainable university governance involves recognizing and addressing the interests and concerns of all stakeholders involved in the university's sustainability efforts. This includes students, faculty, staff, local communities, governing boards, and other stakeholders.

**Application of stakeholder theory in sustainable university governance include:**

- Stakeholder engagement: Universities can engage with stakeholders through various methods, including surveys, focus groups, town hall meetings, and other forums. By listening to stakeholders, universities can better understand their concerns and interests and incorporate them into sustainability policies and practices.
- Transparency and accountability: Universities can be transparent about their sustainability goals and progress towards achieving them. Reporting on sustainability performance, such as carbon emissions, water usage, and waste reduction, provides stakeholders with information they need to understand their impact and develop strategies for improvement.
- Sustainability education: Universities can provide sustainability education to all stakeholders, including students, faculty, staff, alumni, and community members. By increasing sustainability literacy, stakeholders are more likely to support and participate in sustainability efforts.
- Collaboration: Universities can collaborate with stakeholders to develop and implement sustainability initiatives. This includes partnerships with local governments, businesses, and community organizations. Collaboration can help universities achieve



their sustainability goals more effectively and efficiently while increasing stakeholder support.

- Ethics and values: Universities can ensure that sustainability policies and practices reflect their ethical values. This includes considering the impacts of their decisions on the environment, social equity, and economic development. By upholding ethical values, universities build trust and legitimacy among stakeholders.

In summary, the application of stakeholder theory in sustainable university governance involves engaging with stakeholders, being transparent and accountable, providing sustainability education, collaborating with stakeholders, and upholding ethical values. By incorporating stakeholder interests and concerns into sustainability policies and practices, universities can improve their sustainability performance and build support for their sustainability efforts.

### **The theory of responsible management**

The Theory of Responsible Management is a framework for approaching management practices that reflect social, environmental, and ethical values. It is based on the idea that organizations have a responsibility not only to maximize profits but also to contribute to the well-being of society and the environment.

Responsible management encompasses the following principles:

- Ethical Leadership: Leaders must model values-based behaviors and set the tone for ethical decision-making within the organization.
- Stakeholder Engagement: Organizations need to consider the impact of their decisions on all stakeholders, including employees, customers, suppliers, shareholders, and the wider community.
- Corporate Social Responsibility: Organizations have a responsibility to operate in a manner that contributes to the well-being of society and the environment.
- Sustainability: Organizations need to manage resources and operations in a manner that ensures long-term economic, social, and environmental sustainability.
- Transnationalism: Organizations must recognize and respond to the global interdependence and interconnectedness of economies, societies, and environments.



The Theory of Responsible Management provides a holistic approach to management that goes beyond profit maximization to consider the broader social, environmental, and ethical implications of organizational decisions and actions. It encourages organizations to adopt a long-term perspective that balances economic, social, and environmental goals to ensure sustainable outcomes for all stakeholders. By adopting this approach, organizations can enhance their reputation, build trust, and contribute to a more sustainable and equitable world.

### **Application of responsible management theory in Sustainable University Governance**

Responsible management theory can be applied in sustainable university governance in various ways. Some of the ways include:

- **Integration of sustainability initiatives into university governance structures:** Sustainable university governance should be embedded into the university's operating structures, policies, and procedures. For instance, sustainability principles should be considered in the university's strategic plan, risk management, and financial planning.
- **Promote stakeholder engagement:** Universities should engage in stakeholder dialogues regularly to ensure their sustainability initiatives align with the needs and expectations of their stakeholders. Such engagement can help the university to develop policies and initiatives that are socially responsible while also promoting sustainability.
- **Foster a culture of sustainability:** Responsible management theory emphasizes the importance of developing a culture of sustainability in an organization. Universities should, therefore, promote a culture of sustainability by developing sustainability-related training programs, employee engagement activities, and incentives to encourage sustainable behaviors.
- **Promote transparency and accountability:** Universities should be transparent about their sustainability practices. They should set sustainability goals, report on their progress, and engage external auditors to verify their sustainability performance. In addition, they should be accountable for their sustainability initiatives and take corrective actions if necessary.
- **Collaboration and partnerships:** Universities can leverage the power of collaboration and partnerships to enhance their sustainability initiatives. Such partnerships can include working with other universities, government agencies, non-governmental



organizations, and other stakeholders to develop and implement sustainability initiatives that have a positive impact on the community and the environment.

In conclusion, responsible management theory provides a framework that universities can use to promote sustainability governance. Universities can apply these principles to ensure that their sustainability initiatives align with their mission and values while also promoting the well-being of the community and the environment.

### **Niklas Luhmann's system theory**

**Niklas Luhmann's system theory** is a sociological theory that emphasizes that society consists of interconnected and interdependent systems. These systems are self-referential and closed, meaning that they are separate from the environment and do not interact directly with it.

Luhmann's theory is based on the idea that social systems, such as the legal system, the political system, and the economic system, are made up of a set of elements that are connected to each other in a specific way. These elements include communication, expectations, and norms.

According to Luhmann, social systems are self-referential in that they use their own internal feedback mechanisms to maintain stability and adapt to changes in their environment. This means that the system is able to produce its own internal rules and structures, which guide its behavior and interactions with other systems.

Furthermore, Luhmann argues that social systems are not based on individuals or groups, but rather on the communication and interaction between them. This means that the system is able to operate independently of the individuals who comprise it. Overall, Luhmann's system theory provides a framework for understanding how social systems operate, how they are constructed, and how they adapt to changes in their environment. It emphasizes the importance of communication and feedback mechanisms in maintaining the stability and functionality of social systems.

Niklas Luhmann's system theory can help in understanding and analyzing Sustainable University Governance. The system theory emphasizes the importance of communication and social systems in the functioning of organizations. A university, as a social system, has various subsystems that interact and communicate with each other to ensure the smooth functioning of the institution.



In the context of sustainability, universities can be seen as a social system that needs to respond to the sustainability challenges of the society. The sustainable university governance system can be analyzed through the lens of Luhmann's system theory, which provides a framework for understanding the communication and decision-making processes involved in sustainability governance.

The system theory emphasizes the importance of feedback loops and information exchange in decision-making. In the context of sustainability, this means that universities need to have a robust feedback mechanism to ensure that stakeholders' concerns are heard and addressed. The system theory also highlights the importance of self-referentiality, which means that the system reflects on its own actions and decisions in the context of its goals and values.

Effective sustainable university governance can be achieved by adopting Luhmann's system theory principles. This includes promoting effective communication and information exchange, establishing clear sustainability goals and values, and ensuring that there is a continuous process of reflection and review in the decision-making process. By doing so, universities can create a more sustainable future for themselves and society at large.

### **Sustainable development goals and their objectives**

The 17 Sustainable Development Goals (SDGs) and their corresponding objectives:

#### **1. No Poverty**

- Eradicate extreme poverty and all forms of poverty
- Implement social protection systems

#### **2. Zero Hunger**

- End hunger, achieve food security, and improve nutrition
- Promote sustainable agriculture.

#### **3. Good Health and Well-being**

- Ensure healthy lives and promote well-being for all ages



- Combat communicable and non-communicable diseases

#### **4. Quality Education**

- Ensure inclusive and equitable quality education
- Improve access to lifelong learning opportunities

#### **5. Gender Equality**

- Achieve gender equality and empower all women and girls
- End discrimination and violence against women

#### **6. Clean Water and Sanitation**

- Ensure availability and sustainable management of water
- Improve sanitation and access to clean water

#### **7. Affordable and Clean Energy**

- Ensure access to affordable, reliable, sustainable, and clean energy sources
- Promote energy efficiency and renewable energy

#### **8. Decent Work and Economic Growth**

- Promote inclusive and sustainable economic growth
- Provide decent work and employment opportunities

#### **9. Industry, Innovation, and Infrastructure**

- Build resilient infrastructure, promote inclusive and sustainable industrialization
- Foster innovation and promote sustainable technology

#### **10. Reduced Inequalities**

- Reduce inequalities within and among countries
- Empower and promote social, economic, and political inclusion

#### **11. Sustainable Cities and Communities**



- Make cities and human settlements inclusive, safe, resilient, and sustainable
- Improve urban planning and management

## **12. Responsible Consumption and Production**

- Ensure sustainable consumption and production patterns
- Promote sustainable and efficient use of resources

## **13. Climate Action**

- Take urgent action to combat climate change
- Strengthen resilience and adaptive capacity

## **14. Life Below Water**

- Conserve and sustainably use oceans, seas, and marine resources
- Protect and restore ecosystems affected by marine degradation

## **15. Life on Land**

- Protect, restore, and promote sustainable use of terrestrial ecosystems
- Combat desertification, land degradation, and biodiversity loss

## **16. Peace, Justice, and Strong Institutions**

- Promote peaceful and inclusive societies
- Strengthen access to justice and accountable institutions

## **17. Partnerships for the Goals**

- Strengthen the means of implementation and revitalize global partnerships
- Enhance international cooperation for sustainable development

These goals and objectives were set by the United Nations to be achieved by 2030 as part of the 2030 Agenda for Sustainable Development.



## **Sustainable development principles**

**Interdependence:** Recognizing that environmental, social, and economic issues are interconnected and must be addressed together.

**Equity:** Ensuring fair and equitable access to resources, opportunities, and benefits for all people, regardless of their social or economic background.

**Participation:** Engaging diverse stakeholders, including local communities, in decision-making processes to ensure their meaningful involvement and accountability.

**Precaution:** Taking measures to prevent potential harm to the environment and human health, even if scientific evidence is not conclusive.

**Integration:** Pursuing cross-sectoral and integrated approaches that consider the interplay between environmental, social, and economic factors.

**Conservation:** Promoting the sustainable use of natural resources and the protection of biodiversity for present and future generations.

**Resilience:** Building the capacity of communities, ecosystems, and economies to adapt to changing conditions and withstand shocks and stresses.

**Lifelong Learning:** Encouraging continuous learning, innovation, and knowledge-sharing to foster sustainable development.

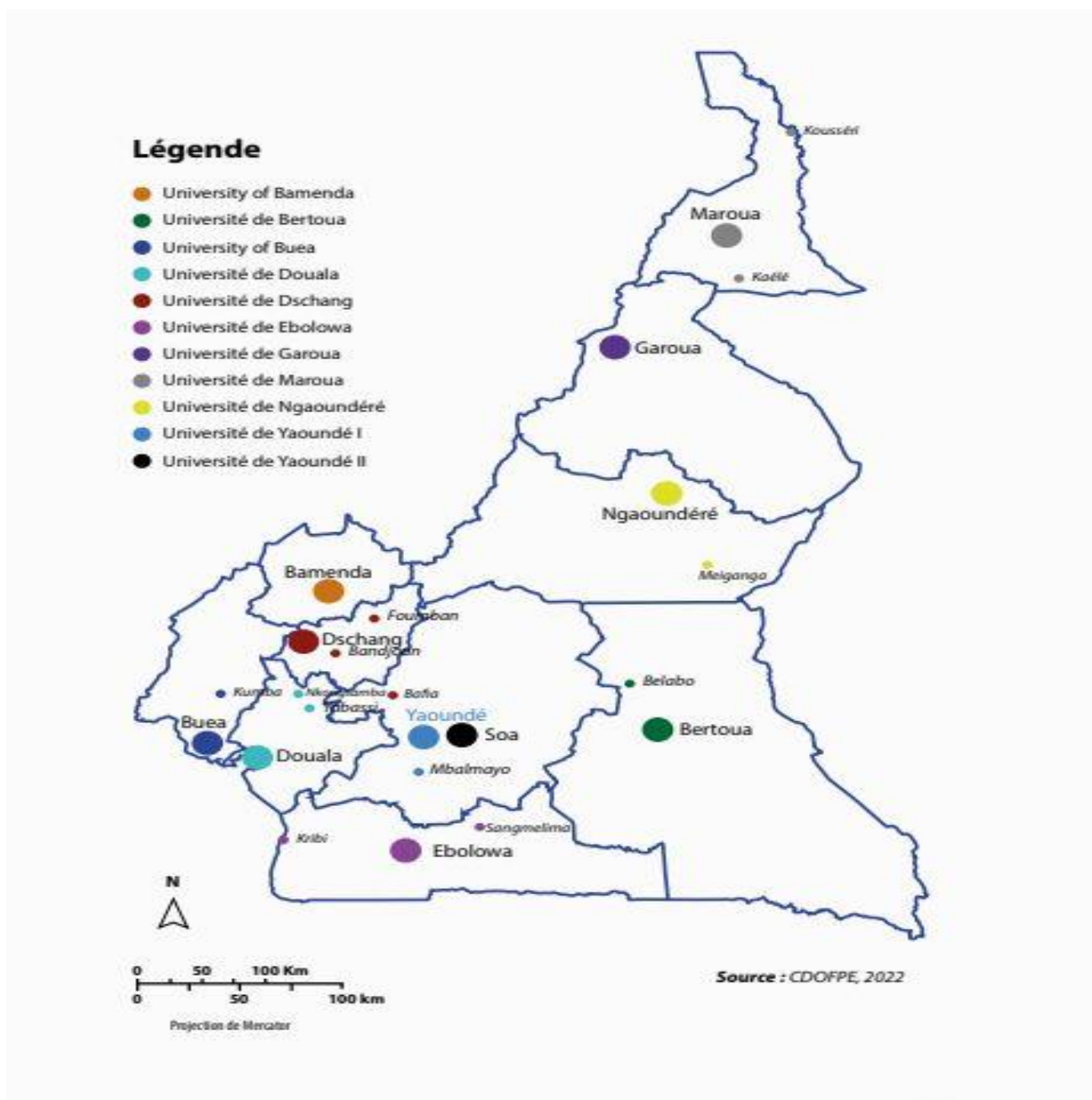
**Accountability:** Holding governments, businesses, organizations, and individuals responsible for their actions and their impacts on sustainable development.

**Global Responsibility:** Recognizing that sustainable development requires collective action and cooperation at the global level to address shared challenges.

These principles provide guidance for decision-making and actions that can contribute to achieving sustainable development goals.



## Localization of states Universities in Cameroon



Distribution of states universities in Cameroon. Source : CDOFPE, 2022



REPUBLIQUE DU CAMEROUN  
 \*\*\*\*\*  
 Paix – Travail – Patrie  
 \*\*\*\*\*  
 UNIVERSITE DE YAOUNDE I  
 \*\*\*\*\*  
 FACULTE DES SCIENCES DE  
 L'EDUCATION  
 \*\*\*\*\*  
 DEPARTEMENT DE CURRICULA ET  
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 UNIVERSITY OF YAOUNDE I  
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 FACULTY OF EDUCATION  
 \*\*\*\*\*  
 DEPARTMENT OF CURRICULUM AND  
 EVALUATION

## Questionnaires For University Students

Dear respondents, I am a PhD student of the university of Yaounde I, Faculty of Education, Department of curriculum and Evaluation. I am carrying out research on the topic: **Analysis on the effects of sustainable university governance on Students' competency in education for sustainable development in state universities of Cameroon.** As part of my requirements of my end of year course, I am required to undertake a research in my area of study. You have been selected as one of my respondents in this study. Your sincere and genuine answers will be important in attaining this goal. All information will be treated with utmost confidentiality.

### Section A - Questionnaires On Sustainable University Governance

**Instruction:** Please rate the various aspects of sustainability governance and competency for sustainable development in terms of the extent to which you agree or disagree with the statements.

#### Part I – Sustainable University Governance

**Instruction:** Indicate in your response the extent to which you agree with the following statements using the scale shown below. **Please tick (√) in one of the boxes that best suit your opinion: 1. Strongly Disagree (SD) 2. Disagree (D) 3. Neutral (N) 4. Agree (A) 5. Strongly Agree (SA).**



### A. University Sustainability Politics

NO	Items	1	2	3	4	5
1	The university has a sustainable development policy					
2	The university has a sustainable development action plan					
3	The university have a sustainable development program					
4	The university has a sustainability officer to address sustainability matters					
5	The university has a vice chancellor or vice rector to address sustainability issues					

### B- University Sustainability Culture

NO	Items	1	2	3	4	5
6	The university strive for environmental sustainability culture					
7	The university strive for social sustainability (peace, equality, equity, human right)					
8	The university strive for economy sustainability (criteria for new product development)					
9	The university measure new product progress on sustainability					
10	The university have future important sustainability-type					

### C- University Sustainability Practices

NO	Items	1	2	3	4	5
11	The university practice recycling of waste					
12	The university practice water and electricity conservation					
13	the university give training on environmental awareness					
14	The university participate in environmental programs					
15	The university deals with environmental friendly suppliers					



**D- University Sustainability Knowledge**

NO	Items	1	2	3	4	5
16	The university is knowledgeable about the effects of climate change in the city					
17	The university is knowledgeable about waste management issues in the city					
18	The university is knowledgeable about issues concerning source of good drinking water					
19	The university is knowledgeable about issues concerning source of electricity					
20	The university is knowledgeable about environmental protection programs					

**E- University Sustainability Management Strategy**

NO	Items	1	2	3	4	5
21	The university produce regularly sustainability reports					
22	The university offer sustainability certifications					
23	The university common understanding of sustainability is reflected in various disciplines ( inter-disciplinary and trans-disciplinary )					
24	The community through elite leaders collaborate with school administration to improve on the quality of sustainability education					
25	The students' governing bodies are consulted to know the difficulties students face in studying sustainability concepts.					

**Part II : Students' Competency For Sustainable Development**

**Instruction:** Indicate in your response the extent to which you agree with the following statements using the scale shown below. **Please tick (√) in one of the boxes that best suit your opinion: 1. Strongly Disagree (SD) 2. Disagree (D) 3 . Neutral ( N ) 4. Agree( A) 5.Strongly Agree (SA).**



<b>A – Knowledge</b>						
<b>NO</b>	<b>Items</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
26	Knowledge of Sustainable Development requires that people understand how the economy works					
27	Knowledge of Sustainable Development results in fair distribution of goods and services to all people around the world					
28	Knowledge of Sustainable Development enables attitude which eliminates of poverty					
29	Knowledge of Sustainable Development does not enable the protection of biodiversity and environment					
30	Every person should receive education that teaches values and skills necessary for sustainable living in a community					
<b>B - Attitude</b>						
<b>NO</b>	<b>Items</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
31	Every person should receive education that teaches values and skills necessary for sustainable living in a community					
32	Males and females should have equal access to all kinds of education and employment.					
33	Citizens who pollute the land, air or water should pay for damage done to communities and the environment					
34	Household tasks should be equally shared among members of the household regardless of gender					
35	As long as resources are, available, using more than we need now does not threaten the health and welfare of future generations.					
<b>C –Behaviors</b>						
<b>NO</b>	<b>Items</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
36	I recycle waste as much as I can at home					
37	I try to do things that will help people live out of poverty					
38	I pick up litter when I see it in a park or a natural area					



39	I participate in democratic activities related to student life at the university					
40	I volunteer to work with local charities or environmental					

### Section - B Demographic Information

Please tick (√) or fill in the spaces with the appropriate answer you are not obliged to give your name. Be equally rest assured that, the data collected will only be used within the framework of this research.

1. Sex: 1) Male  2) Female
2. Age \_\_\_\_\_years
3. University \_\_\_\_\_
4. Faculty \_\_\_\_\_
5. Option \_\_\_\_\_
6. Level of education \_\_\_\_\_
7. Religion \_\_\_\_\_



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## Questionnaires Pour Les Étudiants Universitaires

*Chers répondants, je suis un doctorant de l'Université de Yaounde I, Faculté d'éducation, Département de curriculum et de l'évaluation, effectuant une recherche sur le sujet : Analyses d'effet de la Gouvernance durable universitaire sur la **compétence des étudiants en éducation pour le développement durable dans les université public d'état au Cameroun**. Dans le cadre des exigences du cours, je dois entreprendre une recherche dans mon domaine d'étude. Vous avez été choisi comme l'un de mes répondants dans cette étude. Vos réponses sincères et authentiques seront importantes pour atteindre cet objectif. Toutes les informations seront traitées avec la plus grande confidentialité.*

### Section A - Questionnaires Sur La Gouvernance Durable Universitaire

#### PARTIE I - Gouvernance Durable Universitaire

**Instruction :** Indiquez dans votre réponse dans quelle mesure vous êtes d'accord avec les affirmations suivantes en utilisant l'échelle présentée ci-dessous. Veuillez cocher (✓) l'une des cases correspondant le mieux à votre **opinion** : **1. fortement en désaccord (FD) 2.**

**En désaccord (D) 3. Neutre (N) 4. En accord(A) 5. Fortement en accord (FA).**

#### A. Politique Durable De L'universite

NO	Items	1	2	3	4	5
1	L'université a une politique de développement durable					
2	L'université a un plan d'action de développement durable					
3	L'université a un programme du développement durable					
4	L'université dispose d'un responsable de la durabilité chargé de traiter les questions de durabilité.					
5	L'université dispose d'un vice-chancelier ou d'un vice-recteur chargé des questions de durabilité.					



**B- La Culture En Matière De Durabilité L'universités**

NO	Items	1	2	3	4	5
6	L'université s'efforce d'instaurer une culture de durabilité environnementale					
7	L'université s'efforce d'assurer la durabilité sociale (paix, égalité, équité, droits de l'homme).					
8	L'université s'efforce d'assurer la durabilité de l'économie (critères pour le développement de nouveaux produits)					
9	L'université mesure les progrès des nouveaux produits en matière de durabilité					
10	L'université a d'importantes perspectives d'avenir en matière de durabilité					

**C- Pratiques Universitaires En Matière De Durabilité**

NO	Items	1	2	3	4	5
11	L'université pratique le recyclage des déchets					
12	L'université pratique la conservation de l'eau et de l'électricité					
13	L'université donne une formation sur la sensibilisation à l'environnement					
14	L'université participe à des programmes environnementaux					
15	L'université traite avec des fournisseurs respectueux de l'environnement					

**D- Connaissances Universitaires En Matière De Durabilité**

NO	Items	1	2	3	4	5
16	L'université est bien informée sur les aspects du changement climatique					
17	L'université connaît les problèmes de gestion des déchets					
18	L'université est informée des questions relatives à la source d'eau potable					
19	L'université connaît les questions relatives à la source d'électricité					



20	L'université connaît les programmes de protection de l'environnement					
----	--	--	--	--	--	--

### E- Strategie De Gestion En Matière De La Durabilite De L'universite

NO	Items	1	2	3	4	5
21	L'université produit régulièrement des rapports sur la durabilité					
22	L'université propose des certifications de durabilité					
23	La compréhension commune de la durabilité par les universités se reflète dans les activités interdisciplinaires et transdisciplinaires					
24	La communauté, par l'intermédiaire des leaders d'élite, collabore avec l'administration de l'école pour améliorer la qualité de la durabilité de l'éducation.					
25	L'organe directeur des élèves est consulté pour connaître les difficultés que rencontrent les élèves dans leurs études.					

### PART II : Compétence Des Étudiants En Matière De Développement Durable

Indiquez dans votre réponse dans quelle mesure vous êtes d'accord avec les affirmations suivantes en utilisant l'échelle présentée ci-dessous. Veuillez cocher (√) l'une des cases correspondant le mieux à votre opinion : 1. fortement en désaccord (SD) 2. En désaccord (D) 3. Neutre (N) 4. En accord (A) 5. Fortement d'accord (SA).

A – Connaissance En Durabilité						
NO	Items	1	2	3	4	5
26	La connaissance du développement durable exige que les gens comprennent le fonctionnement de l'économie					
27	La connaissance du développement durable aboutit à une distribution équitable des biens et des services à tous les peuples du monde.					



28	La connaissance du développement durable permet l'élimination de la pauvreté					
29	La connaissance du développement durable ne permet pas de protéger la biodiversité et l'environnement.					
30	Chaque personne doit recevoir une éducation qui lui enseigne les valeurs et les compétences nécessaires à une vie durable dans une communauté					
<b>B - Attitude</b>						
No	Items	1	2	3	4	5
31	Chaque personne doit recevoir une éducation qui lui enseigne les valeurs et les compétences nécessaires à une vie durable dans une communauté					
32	Les hommes et les femmes doivent avoir un accès égal à tous les types d'éducation et d'emploi					
33	Les citoyens qui polluent la terre, l'air ou l'eau doivent payer pour les dommages causés aux communautés et à l'environnement.					
34	Les tâches ménagères doivent être réparties équitablement entre les membres du ménage, quel que soit leur sexe.					
35	Tant que les ressources sont disponibles, utiliser plus que ce dont nous avons besoin maintenant ne menace pas la santé et le bien-être des générations futures.					
<b>C – Comportements</b>						
NO	Items	1	2	3	4	5
36	Je recycle les déchets autant que possible à la maison.					
37	J'essaie de faire des choses qui aident les gens à sortir de la pauvreté.					
38	Je ramasse les déchets quand je les vois dans un parc ou un espace naturel.					
39	Je participe à des activités démocratiques liées à la vie étudiante de l'université.					



40	Je me porte volontaire pour travailler avec des organisations caritatives ou des groupes environnementaux locaux.					
----	---	--	--	--	--	--

### Section -B Information Démographique

Veillez cocher (✓) ou remplir les espaces avec la réponse appropriée) vous n'êtes pas obligé de donner votre nom. Soyez également assuré que, les données collectées ne seront utilisées que dans le cadre de cette recherche.

8. Sexe 1) Masculin [ ] 2) Féminin [ ]

9. Âge \_\_\_\_\_ans

10. Université \_\_\_\_\_

11. Faculté \_\_\_\_\_

12. Option \_\_\_\_\_

13. Niveau d'éducation \_\_\_\_\_

14. Religion \_\_\_\_\_



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