Exploring the Policy Landscape in Alignment to Outcome Based Education in Four East African Countries: Uganda, Kenya, Tanzania and Rwanda

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Abstract

Proposals to enhance the quality of engineering education in Africa strongly suggest a transition to Outcome-Based Education (OBE). OBE offers several advantages over traditional educational systems and also addresses challenges related to employability and international recognition of qualifications between countries. Transitioning to OBE requires a supportive policy framework and environment, as it demands a new approach to curriculum design and development, supported by multiple stakeholders. Therefore, understanding the policy landscape that enables OBE during the transition is crucial. This paper explores how the national policies, systems and context surrounding curriculum in Africa align or support the implementation of OBE. This exploratory study analyses national policies obtained from publicly available information and documents from four East African countries: Kenya, Tanzania, Uganda, and Rwanda. The study explored institutions accountable for regulation of engineering education curriculum, the alignment between higher education bodies and professional societies regarding curriculum and accreditation processes, and existing higher education policies around curriculum design advocating OBE. This study highlights the similarities and differences in the policies and guidelines for curriculum development in these countries and helps in characterising the existing policy landscape and its alignment with OBE. The study provides a baseline for OBE implementation amongst the four countries, and can assist with understanding other countries with similar contexts.

Keywords: Outcome-Based Education, Engineering Education, East Africa, Curriculum development, Higher Education policy

1 Introduction

There has been a paradigm shift in educational practice from a focus on what teachers teach to what learners actually learn, leading to a move towards Outcome-Based Education (OBE) (Bigg & Tang, 2011). OBE is an approach defined by its focus on clearly defined outcomes, alignment of learning and assessment to the stated outcomes with the most distinctive aspect of OBE being alignment (Spady, 1994). This aligns with the student-centred approach to teaching and learning that emphasizes the development of technical as well as professional competencies and skills (Ervado, 2020; Manzoor, 2018).

OBE provides a unique platform with several advantages over traditional teaching and learning. It offers flexibility in teaching strategies and establishes a framework for assessing whether the curriculum and teaching practices facilitate desired student learning while enhancing clarity in both learning outcomes and assessments (Arize, 2017: Badkar, 2017). This enables regulatory institutions across geographical borders to agree on program outcomes, allowing for mutual recognition of qualifications with substantial equivalence. Moreover, clarity in outcomes creates a learner-centered approach, allowing students to be more self-directed learners, increasing their motivation and engagement with the program (Li & Rohayati, 2024).

Proposals to improve the quality of engineering education in Africa strongly suggest transition from traditional education to OBE, partially in response to challenges of employability. OBE is attributed to increasing graduate employability by improving the quality of education to better prepare students for the job market (Manzoor, 2017; Mohammad et al 2012; Oyebode 2021; Rao 2013). Globally, various countries have adopted OBE in engineering education to varying degrees, with different levels of implementation. International agreements such as the Washington Accord influence OBE adoption, and accreditation standards often reflect a shift towards OBE. In Africa, only South Africa is a signatory with full rights of participation in the accord. Nigeria and Mauritius are provisional signatories working towards becoming full signatories. More African countries aspire to become signatories, but in the interim, accreditation standards are guided either by national institutions mandated with the role of regulating and/or accrediting academic programmes.

Whilst transitioning to the OBE curriculum seems ideal for transforming engineering education in African countries, this requires a supportive policy framework and environment. OBE demands a new approach to

designing or developing curricula, with support from multiple stakeholders (Almuhaideb & Saeed 2020, Oyebode 2021). This transition requires intensive efforts by academic staff with associated training in aligning curriculum, teaching methods, and assessments to facilitate key outcomes for the students (Syed et al 2022). It is, therefore, important that the contextual landscape surrounding curriculum design and implementation is understood and considered in the transition. This paper explores the question:

"In what ways do the existing national and institutional policies and systems around curriculum in Africa align with the Outcome based Education concept?"

The study is based on the engineering higher education context, specifically in four selected African countries: Tanzania, Kenya, Rwanda, Uganda.

2 Transitioning to OBE in Engineering Education

1.1 Motivation for transitioning

Although OBE has been embraced by several countries across the globe, there is no comprehensive report about its global implementation in engineering. The Washington Accord (WA), an international agreement between national regulatory bodies, adopted outcomes principles related to OBE upon its inception in 1989 (Anwar & Richards, 2015). Some of its signatories like Accreditation Board for Engineering and Technology (ABET), and Engineering Council of South Africa, (ECSA) adopted the transition from input to output-based education, as reflected in their websites (ABET, n.d.; Engineering Council of South Africa, n.d.). Since then, accreditation standards among the full members of the WA have shifted from an Input-Based to an Outcomes-Based Education (OBE) system, (Laquador, 2014).

Literature indicates that developing countries seek international recognition by joining the Washington Accord and fulfilling accreditation requirements (International Engineering Alliance, n.d.; National Board of Accreditation, n.d.). The benefits of OBE include enhanced employability for graduates and improved industry performance (Obeyede, 2021). According to the Washington Accord website (International Engineering Alliance, n.d.), 25 countries are full signatories, committed to implementing OBE in their engineering programs. Developed countries such as the USA, UK, and Australia have long utilized OBE in higher education, with Australia's adoption occurring in the early 1990s and the US in the late 1990s (Froyd et al., 2012).

Other countries began implementing OBE around 2000, with more joining between 2010 and 2020 (Allais, 2007; Kennedy, 2011; Mohayidin et al., 2008; Jain et al., 2011; Nguyen & Nguyen, 2020; Akramy, 2021). Asian countries such as Malaysia, Indonesia (Handayani & Wibowo 2021), India (Jakhale and Attar 2015), Pakistan, the Philippines (Laguador, 2014), and Bangladesh (Syeed et al., 2022) are adopting OBE to meet national and international accreditation standards. In Malaysia, engineering degrees are required to quantify learning outcomes (Engineering Accreditation Council Malaysia, 2020). Philippine institutions implement OBE to comply with the Commission on Higher Education (CHED) standards and to align with international university standards (Lagoador, 2014; Borsoto et al., 2014; Evardo, 2020).

OBE adoption in Africa is largely unreported, although South Africa has been the sole full signatory of the WA since 1999, while Mauritius and Nigeria have recently gained provisional membership. Nigeria, a provisional member since 2023, sees OBE as essential for addressing globalization, technological development, labor needs, and alignment with the Washington Accord, leading their national regulatory body COREN to develop a framework for OBE in Nigerian engineering programs (Oyebode, 2021). Kenya had also made significant strides towards achieving provisional signatory status with external assessments by international nominators from the Board of Engineers Malaysia and the Pakistan Engineering Council determining Kenya's readiness for provisional signatory status (Accreditation.org, 2025).

The motivation for transitioning to OBE is driven by higher education regulatory bodies in collaboration with professional organizations. A literature review demonstrates that alignment between higher education

policies and engineering professional bodies is crucial for the effective implementation of OBE. Studies, such as those by Syeed et al. (2022) in Bangladesh and Philippines by Lagoador (2014) and Borsoto (2014) highlight significant collaboration among stakeholders in curriculum and accreditation processes.

Institutional preparedness for the transition to OBE, as examined by Evardo (2020), reveals, among other things, a need for faculty training to comprehend OBE principles. While previous studies focussed on readiness from an institutional perspective, they often overlook the importance of national and institutional policies in curriculum design and development. Hence the purpose of this study is to assess the policy landscape and how it is supportive to transitioning to the OBE in the selected East African countries - Tanzania, Kenya, Rwanda, Nigeria, Uganda. The study focuses on African tertiary Engineering education contexts.

1.2 Key aspects/features of OBE

A review of literature on OBE has identified the following important aspects of OBE: 1) Focus on learning outcomes that students need to display at the end of their course, or degree program (Ervardo, 2020; Almuhaideb & Saeed, 2020); 2) Emphasis on equipping students with skills and competencies, technical and soft, required for the job market (Almuhaideb & Saeed, 2020; Manzoor, 2017); 3) Curriculum design that begins with identifying the outcomes, beginning with program learning outcomes (PLO) then course learning outcomes (CLO) then design course content, learning activities and assessments to align with the CLO and eventually the PLO (Deivasigamani & Ragurama, 2022; Lagoador, 2014); 4) Student-centered teaching and learning that encourages active learning, critical thinking and problem solving activities that are essential for engineering practice, with teachers as facilitators of learning (Evardo, 2020; Oyebode, 2021); and 5) having the explicit learning outcomes that will enable learners to self-assess their progress (Gurukkal, 2018; Nguyen et al., 2024).

In addition to the teaching and learning aspect, OBE requires different assessment approaches in order to gauge the types and levels of outcomes gained by students. OBE endorses approaches such as formative and summative assessment; and self-assessment (Syeed et al 2022). OBE requires continuous quality improvement, whereby educational programs are regularly assessed and evaluated, identifying weaknesses and addressing them (Oyebode, 2021; Almuhaideb & Saeed, 2020) to ensure continuous improvement in curriculum, teaching methods and the quality of education in general. In addition, involvement of multiple stakeholders such as faculty, alumni, current students, employers, and government representatives ensures that programs are relevant to industry and that students are well prepared for the workforce (Almuhaideb & Saeed, 2020; Oyebode, 2021).

3 Methodology

1.3 Context and Scope

This exploratory study involves analysis of data from four African countries where the authors originate: Kenya, Tanzania, Uganda and Rwanda. The choice of these countries comes from the authors' in-depth understanding of their educational systems, policies, and the challenges they face in implementing Outcome-Based Education (OBE). With strong connections in these regions, the study offers valuable insights into how well national policies and institutional practices align with OBE frameworks across the different East African contexts.

To address the overarching research question "In what ways do the existing national and institutional policies and systems around curriculum in Africa align with the Outcome-Based Education concept?" we answer the following questions for each country's context:

Q1. Who is responsible for regulation of engineering education curriculums in higher education?

Q2. Are the programme accreditation processes by the higher education quality assurance body/agency and the engineering professional body aligned?

Q3. Are the existing higher education policies around curriculum design advocating OBE? What is the evidence?

1.4 Sources of Data and Method

Two data collection methods were used: a) Anecdotal evidence from the authors' experiences and knowledge regarding policy contexts in their countries b) Documentary analysis of the national policies that guide curriculum development in the respective countries. The documents were sourced from publicly available information and documents obtained with permission from institutions and relevant agencies, such as Accreditation bodies, Engineering Professional Bodies or Universities.

1.5 Developing a Framework for document assessment for OBE

Drawing from the aspects of OBE established from review of previous studies (Almuhaideb & Saeed, 2020; Deivasigamani & Ragurama, 2022; Ervardo, 2020; Manzoor, 2017; Oyebode, 2021) we derived six indicators/features of OBE to look for in the collected documents. These are: Clear Articulation of Learning Outcomes, Curriculum Design Alignment with OBE, Outcome-Based Assessment Strategies, National Policy Support for OBE Present, Stakeholder Engagement, Policy Alignment (within regulatory bodies).

4 Results

Here we present the results addressing the three questions in the methodology section (Q1, Q2, and Q3). To strengthen our argument based on the anecdotal evidence from the authors, we conducted a document analysis to assess policy preparedness across the different countries. In our next paper, we will delve deeper into each country's context by conducting interviews with key experts in the field. These interviews will help us assess policy alignment, identify the causes, challenges, and strengths for each country.

1.6 Who is responsible for regulation of engineering education curriculums in higher education?

Table 1 presents a National Accreditation /Quality Assurance Body and Engineering professional body that is linked to engineering education in each of the four countries being explored in this study.

In Uganda, the National Council for Higher Education (NCHE) regulates higher education through its Quality Assurance Framework, which was first published in October 2006. NCHE was established in 2001 through the Universities and Other Tertiary Institutions Act, with the aim of regulating and overseeing higher education institutions in the country. A revised version, the Quality Assurance Framework for Universities and the Licensing Process for Higher Education Institutions, was introduced in May 2011, and the most recent version was released in 2014. This Quality Assurance Framework has two main components: a) The regulatory component sets national standards for higher education and ensures that universities meet these standards through accreditation, regular audits, and external reviews, b) The institutional component, which focuses on universities' internal processes. Each university is expected to have a quality assurance unit that reviews programs, teaching methods, and assessments to ensure they align with NCHE's guidelines and contribute to maintaining high educational standards (NCHE, 2014).

Table 1: Engineering Education in Uganda, Kenya, Tanzania and Rwanda

	Uganda	Kenya	Tanzania	Rwanda
National Accreditation /Quality Assurance Body in HE	National Council of Higher Education (NCHE)	Commission for University Education (CUE)	Tanzania Commission of Universities (TCU)	Higher Education Council under the Ministry of Education (HEC)
Engineering professional Body	Uganda Institute of Professional Engineers (UIPE) and Engineering Registration Board (ERB)	Previously Engineers' Board of Kenya (EBK) now the Engineering Accreditation Council (EAC).	Engineering Registration Body (ERB)	Institution of Engineers Rwanda (IER)

In Kenya, university education is regulated by the Commission for University Education (CUE) whare the Commission's accreditation process emphasizes quality assurance. The CUE is mandated, in the Universities Act of Kenya No. 42 of 2012 (Government of Kenya, 2012), 'to provide for the development of university education, the establishment, accreditation and governance of universities ….'. Accreditation of engineering programmes is done in collaboration with the Engineer's Board of Kenya (EBK). In 2023/2024, the EBK established the Engineering Accreditation Committee (EAC), as 'an independent institution that oversees and carries out the recognition and accreditation of engineering programs within its mandated jurisdiction'. The EAC which reports to the EBK is responsible for implementation and maintenance of accreditation standards, evaluation and accreditation of engineering programmes, accreditation decision-making and; international benchmarking and standards alignment.

In Tanzania, university education is regulated by the Tanzania Commission of Universities (TCU) (https://www.tcu.go.tz/). TCU is a government agency established 2005, under the Universities Act, Cap. 346 with the mandate to recognise, register and accredit universities in Tanzania. TCU succeeded the Higher Education Accreditation Council (HEAC) established in 1995 which was established to regulate the establishment and accreditation of private universities. TCU is also mandated to regulate local or foreign university-level programmes, coordinate the proper functioning of universities and ensure a harmonised higher education system in the country. "TCU is a member of an Inter-University Council of East Africa IUCEA and AfriQAN (https://www.tcu.go.tz/) and therefore conforms to the standards stipulated by IUCEA. "

TCU has two levels of accreditation in Tanzania, institutional level and program accreditation level. At institutional level, they recognize, approve, register all universities operating in Tanzania, and at the program level TCU evaluates all curricula offered by registered higher institutions in Tanzania (Matemba 2020). At program level, accreditation is done during the process of curriculum review and TCU sets requirements for curriculum review and development in Tanzania i.e. the general framework to be followed and procedure for curriculum accreditation to be observed by university institutions (TCU 2021). and the procedure for curriculum accreditation (TCU n.d.).

The Engineers Registration Board (ERB) is a statutory body established by an Act of Parliament, Tanzania Engineers Registration Act No. 15 of 1997 (http://www.erb.go.tz) to regulate the engineering profession in Tanzania, and it also holds the authority to "accredit engineering programs and register engineers into different levels."

In Rwanda, university is regulated by the Higher Education Council (HEC) which was founded under Law No. 20/2017, enacted on April 28, 2017. HEC's mandate includes advising the government on educational policies

and strategies for higher learning institutions by offering general education programs, setting accreditation standards, monitoring compliance with those standards, approving academic curricula, disseminating policies and decisions, and ensuring the effective implementation of these initiatives.

The Institution of Engineers Rwanda (IER) was established as a professional regulatory body under Law No. 26/2012, enacted on June 29, 2012. Its primary mandate is to regulate, develop, and oversee the activities of those practicing engineering in Rwanda, ensuring adherence to established engineering standards and best practices in service delivery.

1.7 Are the programme accreditation processes by the higher education quality assurance body/agency and the engineering professional body aligned?

We established that alignment between professional bodies and higher education accreditation agencies varied between the East African countries as explained in the results below:

While the NCHE plays a critical role in regulating and ensuring the quality of higher education in Uganda, it also works with professional bodies like the Engineers Registration Board (ERB) and the Uganda Institution of Professional Engineers (UIPE) to ensure that engineering programs align with industry needs. The Quality Assurance Framework (NCHE, 2014) indicates one of NCHE's functions stipulated under Section 5 of the Act as:

"To receive, consider and process applications for the accreditation of the academic and professional programmes of those institutions in consultation with Professional Associations and Regulatory Bodies" p. 3.

The interaction between NCHE, ERB and UIPE is not a formalized process for consistent consultation over time but a one-off whenever accreditation of a programme or renewal of curricula is required. This lack of continued or consistent collaboration may sometimes create gaps between what is taught in universities and the skills needed in the industry. The collaboration seems more intentional at the beginning during program accreditation compared to continuous quality assurance checks to ensure that universities adhere to the standards set or the policies made.

The ERB, a statutory body, advises on curriculum design and focuses on certification and maintaining professional standards, while UIPE, a membership-based organization, ensures programs align with industry needs and advocates for continuous professional development. Both bodies collaborate with NCHE through physical visits to assess universities' staffing and infrastructure but do not have authority over curriculum design or mandate the adoption of OBE. Their role remains advisory, ensuring that engineering programs meet industry requirements in Uganda.

While the CUE was established with the mandate to accredit university programmes in Kenya, concurrently, the Engineering Act of 2011 (Government of Kenya, 2011) mandated the Engineering Board of Kenya (EBK) to approve and accredit engineering programmes. The duality in accreditation has led to uncoordinated and sometimes contradicting directives (Kenya Engineer, 2017). To address the duality, the University (Amendment) Act No. 48 of 2016 has vested an accreditation mandate on CUE superseding any other law (Kenya Engineer, 2017). In the latest version of the Act (Government of Kenya, 2024), published in April of 2024, the law states that 'If there is a conflict between the provisions of this Act and the provisions of any other Act in matters relating approval or accreditation of academic programmes offered by universities, the provisions of this Act shall prevail.' meaning that accreditation is the mandate of the CUE. However, it also states that 'The Commission may, before approving any academic programme consult with any relevant body established by written law to regulate the profession to which the academic programme relates where such law empowers the professional body to approve or accredit courses offered at any university or colleges.' The two have now tried to find a common ground, including establishing joint technical committees to work collaboratively towards accreditation of engineering programmes.

With regards to Tanzania, the involvement of the engineering professional body (ERB) in accreditation of engineering programs remains unclear looking at the information that is publicly available. For example the ERB website has a statement on that saying: “To collaborate with the Tanzania Commission for Universities and other relevant institutions on the accreditation of programs.”(http://www.erb.go.tz) There is nothing further on this on the website, therefore it is difficult to conceptualise their involvement and alignment to TCU. Further, it was previously established in Matemba (2020) that despite the engineering professional body, ERB, having legal mandate to regulate the engineering profession in Tanzania including accreditation of engineering programs which is done by a national accrediting body, TCU, with ERB involvement as an important stakeholder. Since both the TCU and the ERB have mandates to accredit engineering education, there seems to be an opportunity for universities to work with relevant professions through specific professional bodies in accreditation of engineering programs, especially in the area of learning outcomes. For instance, ERB can predefine competencies (skills) or expected learning outcomes that guide curriculum for engineering education.

While HEC is responsible for accrediting engineering programs in Rwanda, IER also plays a vital role in ensuring that the quality of engineering education meets global standards. This includes overseeing the professional training of engineers to ensure their competence aligns with internationally recognized best practices. There is currently strong collaboration between IER and HEC, especially in reviewing the demands of the job market and aligning these with appropriate legal frameworks and accredited policies. This collaboration aims to clearly define the roles and responsibilities of all stakeholders, ultimately enhancing both professional training and engineering practices in Rwanda.

1.8 Are the existing higher education policies around curriculum design advocating for OBE? What is the evidence?

Table 2 provides a list of policy documents that we collected and reviewed to support the findings below. There were the policy documents that were publicly available or accessible to the authors.

In Uganda, there has not been a unified national policy specifically advocating for Outcome-Based Education (OBE) at the higher education level. The available statutory instruments 2005 No. 85 regarding Institutional Standards does not talk about OBE but offers general guidelines regarding standards for curricula including the design and contents of curriculum and programmes. However, some universities, such as Uganda Christian University (UCU) and Makerere University, have made individual strides towards CBE and OBE adoption respectively. For instance, UCU transitioned to a learner-centred approach, focusing on skills development for workforce readiness, which aligned more closely with CBE principles, though these efforts remained institutional rather than national (UCU, 2021).

In 2011, Makerere University, Uganda's oldest public university, launched the Education Partnerships in Africa Project (EPA) with Metropolitan University (UK), focusing on employability and entrepreneurship skills. As part of this initiative, Makerere developed the "Employability and Entrepreneurship Skills Development Program" through the School of Distance and Lifelong Learning (SoDLL), aimed at enhancing practical skills and aligning the curriculum with industry needs. Makerere envisioned adopting an Outcomes-Based Education (OBE) system to emphasize learning outcomes and skills development, helping students become more employable. The program focused on integrating an OBE-based curriculum, with pilot training sessions for out-of-school leavers held in Arua, Entebbe, and Fort Portal. While the goal was to expand this initiative nationwide, it remains limited to the pilot phase and has not yet been fully implemented across all the other colleges in Makerere University or extended to other universities (Wamala, 2011).

Table 2: Existing Policies relevant to Curriculum and Accreditation

Uganda	National Council for Higher Education: Quality Assurance Framework for Universities and the Licensing Process for Higher Education (NCHE, 2014) Source: https://unche.or.ug/
Tanzania	Curriculum development framework for all levels of university education in Tanzania (University Qualifications Framework (UQF) 6–10). (TCU 2021). Procedures for Programme Accreditation (TCU n.d.) University Qualifications framework TCU 2012, Handbook for Standards and Guidelines for University Education in Tanzania. (TCU 2019) THE UNIVERSITIES ACT, 2005 All documents are sourced from the TCU website https://www.tcu.go.tz/
Kenya	An accreditation policy included as part of the Engineering Accreditation Standard (EAC/STD/01) (EAC, 2024, Chapter 2, pp. 4-16)
Rwanda	Higher Education Council: Law N° 010/2021 of 16/02/2021 determining the organisation of education (Higher Education Council, 2021) MINISTERIAL ORDER Nº 001/MINEDUC/2021 OF 20/10//2021 DETERMINING STANDARDS IN EDUCATION (Ministry of Education, 2021) MINISTERIAL ORDER N° 003/MINEDUC/2021 OF 20/10//2021 DETERMINING RWANDA QUALIFICATIONS FRAMEWORK (Ministry of Education, 2021) All documents are sourced from the HEC website https://hec.gov.rw
East Africa	Handbook for Quality Assurance in Higher Education, Volume 2: Guidelines for External Assessment at Program Level (IUCEA, 2010) Source: https://www.iucea.org

To assure quality of university programmes, the Commission for University Education (CUE), published guidelines for designing curriculum for university academic programmes (Commission for University Education, 2009) in 2009 and later in 2014, Universities Standards and Guidelines (Commission for University Education, 2014) to guide universities on the content that should be included with curriculums and how it should be arranged. The guidelines in both documents require inclusion of expected learning outcomes for the programme and for the course. Prior to the establishment of the Engineering Accreditation Council (EAC) in 2023/2024, the Engineer's Board of Kenya (EBK), working collaboratively with the CUE provided additional guidelines on the composition of content within the curriculum for engineering programmes as outlined in the Engineer's Rules of 2019 document (Kenya Law, 2019). When the EBK established the EAC, it was tasked with developing a framework for OBE in Kenyan Engineering Programmes. It now provides an Engineering Accreditation Standard (Engineer's Board of Kenya, 2025), a document developed 'to guide engineering programmes in planning, developing, implementing, reviewing the OBE system and its continual quality improvements'. It has a section that includes an accreditation policy. The Standards document provides clear descriptions of what is expected, for example, in the Programme design, there are Programme Educational Objectives (PEOs), which align to Programme Outcomes (POs) which align to Course/Expected Learning Outcomes (CLO/ELOs). It is also required that the processes used to establish/formulate/define and review PEOs and POs must be described. In addition, performance indicators, assessment instruments, Continuous

Quality Improvement (CQI) activities and Stakeholder involvement activities are also described at all levels of programme design.

While the guidelines may be clear, it is not certain that institutions are adequately prepared to develop OBE curricula and to implement them. There is a need for institutional policies on curriculum development to complement the EAC's policies.

With regards to engineering education in Tanzania, Matemba 2020 established that the engineering curriculum in Tanzania was not outcome-based despite some terms related to OBE being mentioned in some of the policy documents around higher education curriculum and accreditation. Matemba, (2020) who studied the Tanzanian context of engineering education as a case study in her PhD thesis for instance found that TCU stipulates standards and procedures for accreditation of all university programmes but leaves the task of prescribing the learning outcomes to curriculum developers in universities.

On reviewing the Tanzanian policy documents gathered (Table 3), we confirmed no explicit instruction for OBE or even CBE, although there are instructions to develop expected learning outcomes. For example, the Procedures for Programme Accreditation (TCU n.d.) document, contains a checklist for institutions to ensure that their curriculum meets the requirements in addition to its eight steps of curriculum accreditation process. One of the items in the checklist being "Well Formulate Expected Learning Outcomes". Further in another TCU document, the Curriculum Development Framework for all Levels of University Education in Tanzania (TCU 2021, p3) there is a clause that says "3.4 Programme Expected Learning Outcomes and its Associated Teaching/Learning Activities and Assessment Criteria", however there is no further description given on this to entail other aspects of OBE especially the aspect of curriculum alignment.

For Rwanda, IER sought cooperation with the Federation of Engineering Institutions of Asia and the Pacific (FEIAP) in 2018, to establish internationally recognized accreditation and certification systems for engineering programs in Rwanda. To further this effort, IER organized a workshop in Kigali in 2019, bringing together key stakeholders to discuss the development of an Accreditation Policy and Procedure Manual for Engineering Programs in Rwanda's higher education institutions. The workshop was facilitated by Ir. Professor Academician Dato' Dr. HT Chuah of FEIAP and Ir. Professor Dr. BM Goi from the University Tunku Abdul Rahman, who shared insights on engineer mobility, accreditation, and outcome-based education.

Under current law, engineering programs as well as other high learning programs in Rwanda, must be accredited by a Ministerial order based on inspection reports done by HEC through the Ministry of Education. Rwanda is transitioning from a traditional education model to a competency-based education system, with plans to eventually adopt an outcome-based education model. IER, as the professional body, has initiated the accreditation process for engineering higher education institutions, considering the outcome-based education system. However, this initiative has not yet received approval to proceed from the Higher Education Council, which has instead directed the Ministry of Education to take the lead on the matter. IER is currently awaiting further guidance on the next steps in this process.

Table 3 provides a summary and comparison, offering a general picture of how well each country is prepared for implementing OBE.

Table 3: Assessment A of OBE Features in Policy documents at Higher Education

Indicator	Uganda	Kenya	Tanzania	Rwanda
Clear Articulation of Learning Outcomes	No: OBE policy/Framework missing.	Yes: The EAC guidelines provide adequate guidelines on this process.	No: a mention of "Expected Learning Outcomes" without clear articulation in the documents	No: Rwanda learning currently is based on competences not on outcomes
Curriculum Design Alignment with OBE	No: OBE policy/ Framework missing	Yes: Alignment guidelines were not very clear previously. However, the new EAC's standards now provide more detailed direction.	No: OBE policy/ Framework missing	No: OBE policy/ Framework missing
Outcome-Based Assessment Strategies	No: OBE Policy/ Framework missing	Yes: Well-articulated. Institutions, in their curriculum documents have to describe their assessment strategies.	No: OBE Policy/ Framework missing	No: But there is competence-based assessment
National Policy Support for OBE Present	Partially Met: Support for OBE implementation present through institutional support of pilot trainings	Yes: An accreditation policy guiding on OBE is included in the EAC's Standards document.	No: National Accreditation Policy does not mention OBE	No: Existing Policy does not support. Steps towards national accreditation standards that would likely support OBE.
Stakeholder Engagement	Partially Met: Willingness to engage is present, however lack of a policy leaves a gap regarding the next steps.	Yes: requirement for evidence to show that relevant stakeholders were engaged in curriculum development and continuous improvement resulting from feedback and reviews.	Partially met: a clause in pg.3, of curriculum development framework mentions "3.2 Stakeholders Involvement"	Partially met: Collaboration step between stakeholders to discuss the importance of OBE in the engineering program, but they are not yet fully engaged to the end.
Policy Alignment	No: OBE Policy missing	Partially met: need for institutional policies to complement the EAC's policies.	No: OBE Policy missing	Partially met: The concept is available but waiting for the next step.

5 Discussion and Conclusion

Of the four countries included in our study, Kenya has transitioned and now talks about OBE. Rwanda has also started the conversation of including OBE in its curriculum at higher education. However, Uganda and Tanzania have acknowledged the importance of OBE but are yet to put in place clear structures at higher education level to support their transition.

This exploratory study has shed light on the current landscape of national and institutional policies related to curriculum development in engineering education across four African countries: Kenya, Tanzania, Uganda, and Rwanda. The analysis reveals a varying degree of alignment with the principles of Outcome-Based Education (OBE).

In some countries, there is a clear emphasis on quality assurance through national accreditation bodies like the National Council of Higher Education (NCHE) in Uganda and the Commission for University Education (CUE) in Kenya. These bodies establish national standards and ensure universities meet them through accreditation and reviews. However, specific details regarding the integration of OBE principles are often limited or not explicitly stated. This suggests that while quality assurance is a priority, the transition to OBE may not be a uniformly adopted or mandated approach across these nations.

The involvement of engineering professional bodies, such as the Uganda Institute of Professional Engineers (UIPE) and the Engineering Accreditation Council (EAC) in Kenya, indicates a recognition of the importance of aligning education with professional standards, however, the extent to which these bodies actively drive, or support OBE implementation varies. In some cases, professional bodies are involved in accreditation, but their role in shaping curriculum design towards OBE may be limited.

In the study we also encountered the efforts that have been made towards competence-based education (CBE) in relation to OBE; while acknowledging the distinct differences and similarities between OBE and CBE. Terminologies like competence-based education, criterion-referenced learning, and mastery learning are precursors to outcome-based education (Okiror, Hayward, & Winterbottom 2017). CBE is more focused on ensuring the mastery of specific competencies or skills in a self-paced manner before students' progress. OBE addresses a broad set of learning outcomes, including knowledge and skills following a systematic backwards design (Wiggins, 2005), that emphasizes the alignment of curriculum, teaching, and assessment to ensure that students achieve the defined outcomes.

The policy context surrounding OBE and Competency-Based Education (CBE) differs across the studied countries. While some institutions are exploring CBE, as noted in Rwanda, there is a general lack of explicit policy directives or activities indicating a widespread adoption of OBE or CBE from policy documents. Kenya has recently undergone the process of assessment for the Washington Accord, which necessitates changes in accreditation documents and a shift towards OBE. This will support the country's transition to CBE, which has been rolled out at primary and secondary school levels, with the first cohort into university expected in 2028/2029. This means that the competencies that are integrated into the OBE curriculum will have to factor in competencies gained in prior learning. This suggests that international agreements and accreditation requirements can be significant drivers for policy changes and the adoption of OBE.

The findings also highlight the importance of alignment between higher education councils and professional bodies for successful OBE implementation. As argued in the paper, such alignment is crucial for ensuring that curriculum development and accreditation processes support the desired learning outcomes and professional competencies. The varying levels of alignment observed across the countries may explain the different stages of OBE adoption and implementation.

It is important to acknowledge the limitations of this exploratory study. The reliance on anecdotal evidence from the authors' personal experiences and documentary analysis of publicly available information may not be substantial enough to provide a comprehensive picture of the situation. Further research involving

interviews with stakeholders, in-depth case studies, and quantitative data collection is needed to gain a deeper understanding of the challenges and opportunities for OBE implementation in these countries.

Despite these limitations, this study provides valuable insights into the policy landscape surrounding engineering education in the selected African countries. The findings serve as a baseline for further research and can inform policy decisions and strategies for transitioning to OBE. The identification of similarities and differences in policies and guidelines for curriculum development across these countries offers a useful resource for contextual benchmarking and can support regional collaborations and knowledge sharing.

In conclusion, while there is a growing recognition of the importance of quality assurance and alignment with professional standards in engineering education, the transition to OBE is still in varying stages across the selected African countries. Further efforts are needed to develop clear policy directives, enhance collaboration between higher education councils and professional bodies, and provide support for institutions in implementing OBE principles.

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