

Series 2 – Social Pillar: Education and Training

Mitigating Engineering Profession Regulatory Gaps

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Key Messages

Regulation of engineering education by both Commission for University Education and Engineering Board of Kenya resulted in uncoordinated directives. The University (Amendment) Act No. 48 of 2016 that sought to address the duality by vesting accreditation mandate on CUE, created gaps in the regulation of the engineering profession that require mitigation.

Context

Regulation of the engineering profession is critical in developing and safeguarding the nation's infrastructural systems. The regulation of engineering education through separate legal provisions of both the Commission for University Education (CUE) and Engineering Board of Kenya (EBK) resulted in uncoordinated and sometimes contradicting directives. The attempt by the University (Amendment) Act No. 48 of 2016, which was upheld by the High Court ruling of 2020, to resolve the duality by vesting the mandate for accreditation of programmes on CUE has created gaps in the regulation of the engineering profession. This policy brief traces regulation of university education in Kenya, identifies the regulatory gaps and suggests mitigation measures.

Development of Regulation of University Education in Kenya

The first seven public universities in Kenya were established under individual Acts of Parliament that allowed for self-regulation through university organs headed by the Senate, and external regulation by the responsible Government Ministry. Emergence of private universities necessitated reforms for a regulatory framework leading to establishment of the Commission for Higher Education (CHE) under Universities Act Cap 210B of 1985. The increasing number of public universities and the cumbersome process of enacting Acts of Parliament for each university led to enactment of the University Act No. 42 of 2012. The Act established CUE to regulate university education in Kenya. CUE has a wide mandate that includes promoting, setting standards, monitoring and evaluating the state of university education systems and accrediting university programmes. The Commission regulates university education using three legal tools, namely:

1. The Universities Act, No. 42 of 2012, revised 2013;
2. The Universities Regulations of 2014;
3. The Universities Standards and Guidelines of 2014.

Because of the unique nature and roles of professions such as medicine, law and engineering, their education requires the safeguards of close monitoring by peers. Accordingly, Acts of Parliament setting up

regulatory boards, such as the EBK, and mandated them to regulate the training of their respective professions.

Study Approach and Results

The Engineers Act 43 of 2011 mandated EBK to, among other things, accredit engineering programmes in universities, register and license professional engineers, and set standards for engineering practice. EBK regulates the practice of the engineering profession through registration of graduate and professional engineers and the issuance of annual practicing licenses. Registration of Graduate Engineers relies on possession of a Bachelors Degree from an accredited engineering programme.

Section 7(l) of the Act explicitly mandated the EBK to regulate engineering education in Kenya. The University Act of 2012, while establishing CUE to regulate university education, was silent on the prior mandates of professional bodies to regulate education of various professions. Attempts by both CUE and professional bodies to carry out their mandates separately resulted in contradicting requirements on the teaching institutions. On several occasions, boards for regulations of professions halted the teaching of CUE accredited programmes.

Regulatory Gaps Created by University (Amendment) Act No. 48 of 2016

The enactment of University (Amendment) Act No. 48 of 2016 which was upheld by a High Court ruling of 2020 sought to resolve the duality in the accreditation of programmes. Section 5(2) of the Act vested the mandate for approval and accreditation of any academic programme in Universities on CUE. While section 5(3) gives CUE discretion to consult any relevant body established by written law to regulate related academic programmes, Section 5(5) makes it an offence for any person without the authority of CUE to accredit, recognize, audit or inspect a university.

By subjecting the regulatory role of EBK and other professions regulatory boards to the discretion of CUE, the Act created several gaps in regulation of professions, including:

1. Lack of assurance that graduates seeking registration have had requisite academic training

2. Lack of specialized Standards in CUE whereby engineering is categorized in the Universities Standards and Guidelines under the broad applied sciences field.
3. Lack of mandate to incorporate professional objectives in academic programmes
4. Inability to enforce international obligations for mutual recognition agreements that are essential for mobility of engineers to other jurisdictions

The training of engineers faces many challenges including multiplicity of institutions offering engineering education that may be difficult to monitor and control; competition for paying students that compromise admission criteria, and a lack of qualified instructors. These challenges risk achievement of quality and require mitigation.

Development of Mitigation Measures

Despite the Universities Amendment Act of 2016 vesting accreditation mandate for engineering education on CUE, EBK should endeavour to play an active rather than passive role in ensuring that graduates engineers entering the profession gain requisite qualifications. The role may include adopting a collaborative approach to the mandate of CUE but ultimately development on its own safeguard measures. In the US, for example, engineering graduates are required to sit for Fundamentals of Engineers' Examination administered by the National Council of Examiners for Engineering and Surveying (NCEES), before joining the engineering profession as Trainee Engineers (Texas Board of Professional Engineers, 2020).

Given the challenges of regulating engineering education and the need to safeguard the practice of engineering, EBK should consider developing similar tools for vetting of graduate engineers. Administering a graduate engineers' registration examination would have threefold benefits, namely,

1. Safeguard the practice of engineering professions from unqualified graduates.

2. Motivate universities to improve their programmes and quality of students to support the registration of their graduates.
3. Cause students to take their studies seriously.

The suggested examination is a threshold examination aimed at objectively locking out those who fail to meet the minimum qualifications. Provision should be made for assistance in preparation for the examination and for retakes. Because the suggested examination is postgraduate and not a replica of the learning process, it should assess the attainment of the expected learning outcomes of engineering education; namely, knowledge, skills and attitudes.

Pollard et al. (2010) and Hundley and Brown (2013) elaborated these attributes as:

1. Basic knowledge of engineering sciences, mathematics, socio-economics and information technology.
2. Engineering competencies in conceptualization, design, construction, manufacture, operation and maintenance of structure, processes and systems.
3. Communicate technically through design reports, presentations, drawings and specifications.
4. Understand the execution of engineering projects.
5. Flexibility to innovate by developing sustainable solutions through critical thinking and creativity.
6. Conscious of the impacts of engineering decisions on economic, environment, health and safety, and social and cultural aspects of society
7. Bound to ethical conduct and professionalism.
8. Commitment to lifelong learning

Policy Recommendations

Short-Term

- Creation of an office at EBK for liaison with the Commission for University Education.
- Establishment of a pool to resource persons from industry to participate review of engineering curricula.

Medium-Term

- Institution of a Graduate Registration Examination for engineering graduates joining the profession.
- Development of guidelines and minimum requirements in the training of engineers.

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