UMA Feedback on the Quality of Engineering Training from Uganda Training Institutions

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Preamble

Over the last 15 years the student uptake in higher education in Uganda has almost doubled. Given the scale of this expansion, concerns have been expressed that the increased output of graduates may not be matched with an increase in demand. This has raised concerns about the value of higher education.

This feedback documents findings of two surveys on UMA member satisfaction in relation Engineering graduate interns placed in their companies for a period of 2-6 months from 2015 to 2019.

The first survey was conducted between 2017-2018 under a project called Improving Youth Leadership and Entrepreneurship Skills. The three institutions that participated were St. Joseph Technical Institute, Ndejje University and Uganda Christian University. A total of 176 graduates placed in 133 companies were contacted for the study.

Preamble

The second survey was conducted under Higher Education Science and Technology (HEST) Project. UMA hosted HEST project from 2015 to 2019. Institutions involved were Kyambogo University (KYU), Busitema University (BU), Makerere University (MaK), Gulu University (GU), Mbarara University of Science and Technology (MUST), Lira University (LU), Muni University (MU), Uganda Management Institute (UMI), and Makerere University Business School (MUBS

A total of **5,502** graduates were trained in work readiness skills of which **3,445** were placed. During project implementation continuous support supervisions and annual intern's status surveys were conducted. From November 2019 to Jan 2020 a project impact assessment was conducted. Of the **2,149** graduate respondents placed in **865** companies, a total of **1,426** were employed and **332** were self-employed.

Feedback form Graduates within industry

- *Big numbers and limited resources in training institutions limit the quality training.* Limited resources include, computers, limited text books, limited internet access laboratories and field work equipment.

- *Difficulties faced by students in getting placements in companies.* Graduates mentioned difficulties or failure to get industrial training placements which is necessary for all engineering courses.

- *Conflicting Timelines* Companies that offer Industrial training have a timeline requirement that conflict with the Training institutions timelines.

- *Training methodologies disconnected from Realities of work.* There is a disconnect between the methodology of teaching in institutions and the required skills at work. The methodology is not matched to skill needs needed later on in life.

- *Diverging expectations of students and instructors*: The students have different expectations from the instructors. The learners expect that the lecturer should give them knowledge as compared to facilitating them to acquire knowledge.

- *Lack of certain skills by instructors:* In the era of technology, you some lecturers hardly demonstrate using technology during this digital era.

Feedback from Industry (Employers)

➥ *Lack of hands on Practical Experience:* Graduates l**ack hands on practical experience** as internships periods are very short. This has led to poor attitudes towards practical engineering work **as** Many graduate engineers(74%) do not want to get dirty.

➥ *Lack of Key Competencies*: Some essential skills needed by employers are not exhibited by the graduates. (e.g. Production engineering and industrial chemistry,) Other general competencies missing include computer, presentation, communication, analytical and organizational skills).

➥ *Overwhelming Expectations:* Engineering graduates have very high expectations including executing little work, going home early, receiving high allowances and salary to mention but a few. Often the expectations are not met leading to high turnover.

➥ *Lack of latest Technology in institutions of higher learning:* Many students have been tested practically on the use of particular technology available on the open market in their field of study, however, most of them cannot accurately apply the technology.

Feedback from Industry (Employers)

➡ *Failure to translate theory into practical:* Many interns can theoretically explain concepts however these cannot translate it into practice e.g. can theoretically explain the process of creating advanced infrastructure of robotics, however, they have no idea how this can be done.

➡ **A mismatch between the expectation of employers in a particular course and what is taught at the universities:** the industry expects particular students to poses particular traits when presented. However, this is not usually the case as most even lack the basic field skills .

➡ **Lack of Knowledge on New methodologies of production and advanced software:** Universities do not update their materials to include new production methods and software hence students do not posses this knowledge.

➡ **Too much specialization:** Employers were very skeptical about bachelor courses which are very specific with little relevance to general duties at companies. Specialization for particular courses is rather at an early stage which is not recommended.

Recommendations from Students, Lecturers and Tutors

➡ **Finalist students should be devoted more to practical**. Half of the modules to practice, reduce theory. Final year project should be presented over a period of time to allow constructive criticism and feedback. and correction not only in 30 minutes as it is in some cases. should be closer to where it was done (e.g. in the lab, field) not in class

➡ **Bring the field to the campus**. Some of the courses should be taught as vocational courses

➡ **Increase resources:** The universities should not offer course they cannot accommodate or facilitate adequately in terms of resources. University zoning and competence should be observed

➡ **Partnerships with private sector**: The universities should ensure closer cooperation with private sector so as to secure internship places and to monitor learning progress of interns placed there.

Recommendations from Employers

- **Orientation Training**: Employers should use the probation period to support graduates to fit in the work environment in the long run. This method can also be used to invite industrial specialists and players to facilitate at the universities

- **Retooling Lecturers:** The trainers/lecturers from Training institutions also need retooling by placing them in industry. This should be annual for then to capture the industrial changes and requirements.

- **Institutions to become Centres of Excellence**: There is need for specific institutions to be centers of excellence in particular Engineering specialties.

- **Focus on future training of Engineers.** In addition to technical training, future training should focus on soft skills like entrepreneurial/business; supervisory; communication; adapting to change/resilience; willingness to learn; ethics and integrity; Resource efficiency; Quality management; training; innovation; Analytical /critical thinking; computer literacy and organizational skills.

- Regular update of the curriculum is necessary to reflect changing reality of industry.

Conclusion

Institution of a tripartite Partnership Framework: Universities, industry and government should establish concrete mandatory legally binding partnerships to articulate the framework for internship training. Employers and training institutions should partner in defining the required training. Focus being on increasing work place training time and efficiency at work.

A models such as 80% of training time to be spent in industry and 20% can also best fit the practicability of the current curricular at higher learning. Labor laws should be enacted to provide for interns regarding liabilities, insurances, confidentiality, Occupational Health, Safety and Security (OHSS), remuneration, etc. Tax reductions scheme for companies that train can be explored.