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Research Application Summary

**Taking pro-active actions to enhancing the quality of African universities
graduates for the labour market**

Egeru, A., Nampala, P., Okalany, E., Owuor, C., Nnam, J., Apio, J. & Adipala, E.
Regional Universities Forum for Capacity Building in Agriculture, P. O. Box 16811, Wandegaya,
Kampala, Uganda

Corresponding author: a.egeru@ruforum.org

Abstract

African Universities are facing an unprecedented growth in enrolment that has more than doubled in the last decade alone. This growth pattern has affected the teaching, learning, supervision and mentorship processes as on average one professor has at least 50% more students compared to the global average. The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) is in constant search for best practices and innovations that help to improve the delivery of quality education attainment in the 60 member universities. Through a consortium of partners and associated partners, RUFORUM is participating in an innovative project on deploying interactive on-line networking platform for improving quality and relevance of African University Graduates to labour markets. The purpose of this paper is to share the lessons and experiences garnered during the implementation of project activities under the RUFORUM component. Commendable success has so far been achieved in terms of development of six innovative PhD programmes in various disciplines including agricultural biosciences, agro-ecology, petroleum studies and forestry resources. In addition, four master's programmes at Egerton University, Gulu University and University of Antananarivo have received technical backstopping to strengthen their implementation processes. Students in various African universities have received various transferable skills including; adaptability, self-awareness, critical thinking, collaboration, decision making and ethical action, among others. Consortium partners and other RUFORUM network members are taking proactive steps towards establishing mechanisms for supporting graduate supervision and mentorship including the use of digital feedback platforms. In moving forward, it is vital that universities undertake retooling of faculty and mid-career personnel as well as students, and continue to innovate in the delivery of graduate supervision and mentorship. Universities further need to organize on regular basis career talks that help graduates in their career paths through network and formation of communities of practice aspects of which are not routinely covered through the conventional curriculum.

Key words: ICTs, Network, RUFORUM, transferable skills

Résumé

Les universités africaines sont confrontées à une croissance sans précédent des inscriptions qui ont plus que doublé durant la dernière décennie. Ce modèle de croissance a tellement affecté les processus d'enseignement, d'apprentissage, de supervision et de mentorat que, en moyenne, un professeur a au moins 50% plus d'étudiants par rapport à la moyenne mondiale. Le Forum des universités régionales pour le renforcement des capacités en agriculture (RUFORUM) est à la recherche constante des meilleures pratiques et des innovations qui aident à améliorer la prestation de l'éducation de qualité dans les 60 universités membres. Grâce à un consortium de partenaires et partenaires associés, RUFORUM participe à un projet innovant sur le déploiement en ligne d'une plateforme interactive de réseautage pour améliorer la qualité et la pertinence au marché du travail des diplômés des universités africaines. Le but de cet article est de partager les leçons et les expériences encaissées au cours de la mise en œuvre des activités du projet dans le cadre du volet RUFORUM. Le succès intéressant a jusqu'à présent été atteint avec six programmes de doctorat innovants dans diverses disciplines, notamment les biosciences agricoles, agro-écologie, des études de pétrole et des ressources forestières développées. En outre, quatre programmes de maîtrises à l'Université d'Egerton, l'Université de Gulu et de l'Université d'Antananarivo ont reçu un appui technique pour renforcer leurs processus de mise en œuvre. Les étudiants de différentes universités africaines ont reçu diverses compétences transférables, y compris l'adaptabilité, la conscience de soi, la pensée critique, la collaboration, la prise de décision, et l'action éthique, entre autres. Les partenaires du consortium et d'autres membres du réseau RUFORUM prennent des mesures proactives en vue d'établir des mécanismes pour soutenir la supervision des études supérieures et de mentorat, y compris l'utilisation de plates-formes de rétroaction numériques. Pour l'avenir, il est essentiel que les universités s'engagent dans les recyclages du personnel de la faculté et en milieu de carrière ainsi que des étudiants, et continuer à innover dans la prestation de supervision des études supérieures et de mentorat. Les universités en outre ont besoin d'organiser de façon régulière des entretiens de carrière qui aident les diplômés dans leur cheminement de carrière à travers le réseau et la formation de communautés de pratique ; des aspects qui ne sont pas systématiquement couverts par le programme conventionnel.

Mots clés: les TIC, le réseau, RUFORUM, les compétences transférables

Background

African Higher Education particularly in sub-Saharan Africa has grown at unprecedented rates in the last decade in at least in terms of enrolments. For example, between 2000 and 2010, enrolment more than doubled increasing from 2.3 million to 5.2 million (UN, 2011). This rate of growth in enrolment is at least twice the global rate; this is further being accelerated by the growing importance attachment to higher education particularly university education at the expense of vocational education. This focus has been justified by the fact that a one year's increase in tertiary education level will lead to a 12% growth in GDP but time and again, employers and companies operating in African repeatedly cite insufficiently skilled labor as a bottleneck to growth and innovativeness in their enterprises as well as a

justification for employing ‘expatriates’ (AAI, 2015). Africa’s higher education boom has been so rapid that on average there are at least 50% more students per professor at African universities compared to the global average, actions that have tremendously affected quality of education and education outcomes as well as quality of the graduates (AAI, 2015). This pattern is however set to continue given that projections available show a growth trend of about 50% by 2030 that are associated with increased investment in primary and secondary education that will continue to provide students requiring entry into higher education institutions within Africa (British Council, 2014).

Addressing the bulging numbers of students in African universities at the current situation of constrained funding into higher education as well as limited number of academics requires innovative approaches to facilitate learning. This is because the current face to face learning and teaching processes have become inefficient and so stretched given the teacher-student ratio; thereby weakening the teaching, learning, supervision and mentorship processes that are vital in producing high quality and relevant graduates that can readily adapt to the demands of the labour market. On-line learning platforms and taking advantage of the technological advancements, increased internet connectivity and increased availability of computers at both institutional and personal level are now being encouraged in educational processes. On-line based platforms and ICTs provide opportunities and possibilities that tear down the territorial boundaries and bottlenecks to learning associated with large student class sizes and further make available equal information and knowledge to different categories in timely manner (Idowu and Esere, 2013). Further, Anderson (1996) articulated that the capacity to support collaboration, reflection, and professional development, as well as the ability to overcome barriers of time and place, makes the use of on-line forums and technologies useful and cost effective innovations.

Accordingly, in 2013, a consortium consisting of the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), Egerton University, Jomo Kenyatta University of Agriculture and Technology, Makerere University, AGRINATURA (Network of European Agricultural Universities), African Biodiversity Conservation and Innovations Centre (ABCIC), Futuristic, Forum for Agricultural Research in Africa (FARA) and African Women in Agricultural Research and Development (AWARD), received a grant from the European Union under EDULINK II to implement a project titled “*Deploying Interactive On-line Networking Platform for Improving Quality and Relevance of African University Graduates to Labour Markets*”. This project is focused at taking advantage of Africa’s increased public investment in fibre optic cables and ICT upgrading to deploy user-friendly, interactive on-line technology platforms that will complement face-to-face contacts learning and to enable universities to efficiently and effectively supervise, mentor, track and network their graduates, graduate alumni and faculty staff with community of researchers, academics, practicing professionals and the agricultural labour market (ACP-EDULINK, 2013). This project is now at its second year of implementation. The purpose of this paper is to share experiences and lessons emerging from the implementation of this project, particularly aspects under RUFORUM component.

Improving curriculum and delivery mechanisms for relevancy to agricultural labour markets

RUFORUM facilitated six curriculum review and development engagements in five network universities namely Gulu University, Uganda Martyrs University, Eduardo Mondlane University, Busitema University, and Makerere University. These curricular were responding to strategic national and regional needs, particularly addressing critical niche areas that strategic help to address focus areas raised by the World Bank during the Eastern and Southern Africa Higher Education Centers of Excellence Project (ACE II) call for proposals. In each of these programmes, emphasis on the utilisation of ICTs and On-line platforms is emphasized to enhance the quality of teaching, learning, supervision and mentorship. The curricular reviewed and developed include the following:

- 1) PhD in Agricultural and Applied Bio-sciences at Gulu University. This is a four year PhD by coursework and research that focuses on the following thematic areas: (i) Food systems and Agribusiness; (ii) Efficiency of Small and Medium Enterprises (SMEs) and Smallholder Production Systems; (iii) Food Security and Community Nutrition; (iv) Food Safety and Quality Management; (v) Policy Analysis; (vi) Hydrology and Irrigation Engineering; (vii) Food Process Engineering and Technology; (viii) Bioenergy and Sustainability; (ix) Climate Change and Community Adaptation; (x) Environmental Management and Biodiversity Conservation; (xi) Plant Bio-Resources and Stress Management; (xii) Sustainable Crop Production and Ecological Management; and (xiii) Sustainable Animal Production Systems.
- 2) PhD in Agro-Ecology at Uganda Martyrs University. This is a taught PhD programme that builds on the wide experience of Uganda Martyrs University in implementing agro-ecology programme at master level. This PhD programme focuses at producing skilled professionals with interdisciplinary and international orientation to facilitate the development of institutions and structures for sustainable utilization of knowledge and technologies in Agroecology in an integrated manner. The programme will further focus on building a critical mass of highly motivated and dynamic graduates with capacity to face the new challenges and intricacies facing Agriculture today and beyond.
- 3) PhD in Petroleum Studies at Makerere University. This is a taught PhD programme that responds directly to the Government of Uganda workforce skills development strategy and plan for the oil and gas sub-sector (2015-2024) and the aspirations contained in Uganda Vision 2040. It also responds to the strategic vision of the Northern Corridor and therefore will provide training in petroleum studies including oil and gas and geosciences for the broader Eastern and Southern Africa Region. The PhD programme will also strengthen the capacity of industry through skills-based enhancement programmes focusing on policy analysis and community engagement. In this programme, ICTs will particularly be used to increase the quality of supervision with collaboration with other African universities and partner universities in Europe such as University of Bergen.
- 4) PhD in Science Education at Busitema University. This taught PhD programme takes a unique approach with a focus at practical skills development through field placement of the students for industrial attachment in appropriate industries and work environment. This will further facilitate the identification of relevant research challenges and focus

research to addressing the real needs of industry and society. The programme will be admitting persons with background in biological and physical sciences including physics, chemistry, biology and other relevant science disciplines.

- 5) PhD in Forestry Resources (Silviculture and Forest Management, Environment and Wildlife, Technology of Forestry Products); PhD in Agronomy (Plant Protection, Agricultural Economics, Soil and Water management); and PhD in Management and Policies in Agricultural (AGrifood) Sector at Eduardo Mondlane University. The three PhD programmes are broad based and take advantage of the expertise resident at Eduardo Mondlane in managing natural resources and forestry studies. These programmes have been developed to build capacity in these critical areas not only for Mozambique but the wider southern Africa region.
- 6) MSc in Rural Agri-Enterprise Development, Entrepreneurship and the Field Attachment Programme at Egerton University and Gulu University, and the MSc. in Food Security and Community Nutrition at Gulu University. These programmes have received technical backstopping from EARTH University in Costa Rica to better deploy ICTs in mentorship and field attachments with a special focus on reviewing how the field attachments and community engagements are implemented. This strategically responds to the needs of working with smallholder farmers in Uganda and Kenya, and strengthening university-community linkages.

RUFORUM's engagement with Network members during the course of curricular review and development has yielded the following over-arching lessons. First, the faculty and other stakeholders recognize the need for revised curricular that should be accompanied with retooling of faculty to facilitate ease of adoption and implementation. Second, non-university actors also recognize the need for adaptation of curricula to market demands and are willing to partner with the universities. However, each university needs to develop a clear partnership framework, outlining the actors and their terms of engagement including student supervision and mentorship and the intended outcomes based on its context, including capacities, development focus, location and available partners. Major challenges were that universities were slow at making the required changes. Where university administration has been proactive, such as at Egerton and Gulu universities, curriculum transformation has gained momentum. It appears that emerging, smaller universities have a better opportunity to transform than the established ones. Gulu University, for example, has demonstrated flexibility in adopting reforms. Continuous engagement and sensitization of university leadership to ensure buy-in needs to be intensified. Further, RUFORUM has used its convenings of annual Vice-Chancellors and University Deans and Principals meetings for lesson learning and mobilizing for institutional reforms.

Mentorship through motivation and career talks

Development of transferable skills among graduate students in higher educational institutions goes beyond the classroom environment. The RUFORUM Secretariat has a set of personnel that are experienced both in disciplinary and development perspectives. In addition the Secretariat has in its disposal academics and senior Faculty from 60 universities in 25 countries in Africa that it routinely leverages expertise from time to time to provide career talks for

graduate students. RUFORUM also mobilizes industry, research and policy actors to interact with faculty and graduate students. In this regard, RUFORUM staff and network faculty delivered motivational talks to students in selected member universities of Egerton, Makerere, University of Nairobi and Jomo Kenyatta University of Agriculture and Technology. In addition, the Project facilitated the process of reaching out to the wider RUFORUM Network through delivering motivational and career talks to students at Stellenbosch University, Sokoine University of Agriculture, Uganda Martyrs University and Lilongwe University of Agriculture and Natural Resources (LUANAR).

The key emerging lesson from this exercise is the need for universities and the private sector to closely engage in shaping the mindsets of students, with particular emphasis on developing the following qualities and skills: leadership, courage, empathy, visioning, integrity, humility, resilience, inclusiveness and curiosity. There is also need to further develop delivery skills that increase students' performance in places of work including, among others, adaptability, self-awareness, critical thinking, collaboration, decision making and ethical action. These need to be developed on a continuous basis as the curriculum is implemented. Universities will therefore need to have dedicated offices and persons responsible for coordinating these processes. Further, scholars face diverse challenges and thus need continuous career guidance to ensure smooth transition out of education. Capacity gaps also exist in adapting research to the needs of society, scientific authorship and writing proposals for funding. Overall, there is a need for a facilitated process to enable students and their supervisors to bond to be an effective research team. Platforms for student interaction and articulation of challenges need to be organized at each university.

Institutional framework and mechanisms for deploying open graduate supervision and mentorship

RUFORUM is in continuous search for institutional strengthening including reform in processes at member universities. As part of its own contribution to the EDULINK II project, RUFORUM has supported the development of institutional frameworks and mechanisms for graduate supervision and mentorship by providing nurturing grants to Gulu University and Egerton University. Through a nurturing grant to EARTH University to draw lessons from its successful model that builds ethical leaders able to support sustainable natural resource management via programmes involving undergraduate internship and entrepreneurial skill development, EARTH University is providing technical backstopping to Egerton University and Gulu University. EARTH University is supporting the development of an internship and students supervision framework and community attachment programme at both Egerton and Gulu universities. Further, RUFORUM Secretariat staff undertook a study visit to EARTH University to acquaint themselves with the unique models for training, mentorship, supervision and community engagement so as to better steer the African universities forward particularly with the development of entrepreneurial mindset among graduates. Efforts are also underway to bring on board Makerere University to review its field attachment and the development of a new Programme focusing on Entrepreneurship.

Universities within the network are further taking proactive steps and engagement in deploying ICTs in supervision and mentorship as observed at Egerton University, Makerere University, Jomo Kenyatta University of Agriculture and Technology and Uganda Technology and Management University. The Uganda Technology and Management University has particularly been impressive in utilizing ICT platforms for students meetings and teacher-student interactions in project development and implementation of enterprise and innovation projects through an online platform (Decision Studio). A similar innovative approach is underway at Africa University in Zimbabwe. Egerton University has made a specific request to RUFORUM to be supported to develop an online-based system that will be deployed to deliver programmes to large classes while Makerere University, through the Quality Assurance Directorate is operationalizing an online-based reporting system for graduate students and faculty to facilitate graduate supervision. Makerere University will this year also launch an online MSc programme in Agricultural Information and Communication Management. Similarly, both Uganda Technology Management University and Uganda Martyrs University have launched both face to face and online delivery of MSc in Monitoring and Evaluation. These programmes require significant input in terms of strengthening pedagogical skills of lecturers and there is an ongoing effort to address this gap.

Out of these engagement, it is evident that all universities have internship programmes. However, the outcomes of these programmes are not well articulated and require situating in a broader strategic framework to support community engagement and strengthening the practical skills of the graduate students. This process has commenced at Egerton and Gulu universities which will provide a model and lessons for the wider RUFORUM Network. Pilot activities under taken to date are described in this volume and elsewhere (Kalule *et al.*, 2016; Mungai *et al.*, 2016). Further investment is required to automate student placement, tracking and communication during the field attachment and internship; innovative ICTs platforms are urgently needed in this respect. In this regard, a well thought through strategic framework that allows universities to innovatively deploy ICTs whilst managing for quality will enable them to respond more closely to their three mandates of teaching, research and outreach in a more holistic and reinforcing way. Most importantly, an ICT framework, such as the SUFACE model being piloted by Makerere University (Mirembe *et al.*, 2016) is needed to monitor community impact and to facilitate tracking of university engagements.

Build appropriate capacities for key institutional players

Appropriate capacities are required among the academics and university staff in mid-career managerial positions to facilitate effective supervision and mentorship of graduate students. Currently, RUFORUM is working with its member universities to enhance skills in using social media for research supervision, dissemination and increasing institutional visibility in selected universities including University of Namibia (Namibia), Lilongwe University of Agriculture and Natural Resources (Malawi), University of Kordofan and University of Gezira (Sudan). It will run a similar skill enhancement training for close to 250 graduate students during its Fifth Biennial Conference to be held 17-21 October 2016 in Cape Town, South Africa. RUFORUM has also engaged experts in e-learning and ICT for agriculture to develop a RUFORUM-wide strategy for online programme delivery and supervision of

students. Based on lessons from this and other previous projects, the strategy articulates the challenges and future directions that the RUFORUM Network should take in terms of e-learning and online supervision and mentorship of students. Furthermore, there is an ongoing effort to scale up this initiative through partnership with AGRINATURA. This widened engagement with European partners such as with University of Ireland, Open University of Catalunya and Ghent University to scale out e-learning through development of a joint effort on “*Integrating ICT in Training, Research and Outreach Processes in African Universities*” will open wider access to supervision of graduate students in African universities.

Sensitization of RUFORUM Network universities in the use of platforms that advance mentorship, training and quality graduate research has been undertaken through meetings held at Stellenbosch University and University of Namibia. At Stellenbosch University, there was participation from University of Zimbabwe, Makerere and UTAMU, and focus was paid to utilizing internationally recognized databases that increase efficiency of university operations. In Namibia, all the 55 RUFORUM Network member universities were represented in a plenary session that deliberated on the advancement of institutional capacity, research and investment in tracking systems. It is recognized that the concept of e-learning and online supervision and mentorship of students was relatively new to many senior Professors in African universities was an increasing trend. Gradual capacity building will be required to domesticate these concepts and allow for contextually appropriate innovations. Both students and supervisors are gradually appreciating the potential of e-supervision and mentorship and institutional frameworks for effective delivery. Adopting this approach should give supervisors leeway to innovate as further technological advances are expected, rapidly in due course.

Develop and implement relevant incentive schemes

The RUFORUM Information Management system is being implemented to support universities to adopt online student supervision. Both the supervisors and students report online on progress of project implementation and their academic progress. RUFORUM is also implementing an online platform (Moodle) to host online courses for MSc Agriculture Information and Communication Management, MSc in Research Methods and PhD in Aquaculture and Fisheries Science. Discussions with e-learning experts indicated that incentive schemes should extend to students as well. Currently, emphasis is often placed on faculty with the bulk of resources allocated to developing course content and the digital platforms while little attention is paid to delivery of content in an interactive manner that simulates a live classroom environment and keeps students engaged.

Conclusion

Promoting wider use of on-line platform teaching and supervision and mentoring of students require deliberate effort to be promoted and made visible among universities in Africa. As such, RUFORUM undertook promotional activities to increase programme visibility and disseminate project outputs for awareness creation, lesson sharing and advocacy. The project’s

outputs have been delivered in various fora including the 2014 Biennial Conference in Maputo Mozambique and the EU visibility event held at Makerere University in May 2015 to showcase the on-line Project and other related initiatives. The envisaged partnership with AGRINATURA Universities, the advancement being made to mainstream use of ICTs in Africa Universities, the increased bandwidth and access to ICT infrastructure should accelerate the wider adoption of ICT platforms for increased access to education and academic mentors.

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