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Research Application Summary

Approaches to retooling University faculty in innovative pedagogic approaches to develop the creative and innovative potential of young people

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Abstract

Globally, several higher education institutions are undergoing reforms to render instructional practices and educational systems more effective in generating the targeted type of graduate. The main stimulus for these reforms is the hypothesis that a country's future economic well-being is reliant on the ability of that country's population to innovate, be creative, and to analyze and solve problems. Amongst the several reforms includes the shift from subject matter specialists solely responsible for transmitting information, to facilitators in the educational process of the knowledge-based economy. Retooling university faculty in such innovative pedagogic approaches adequately prepares them to deliver training that enables graduates fit into the currently advocated knowledge-based economy through enhancing students' abilities in problem solving, teamwork, learning to learn, and reflective thinking. Within the knowledge-based economy, universities and university faculty co-exist thereby necessitating faculty to adopt the same skills being developed in their students. This will enable them to inculcate qualities of flexibility, networking, creativity, and innovative thinking into students. Additionally, there is evidence that application of experiential learning approaches including community engagement is not institutionalized in several universities, thus limiting the attainment of critical and reflective thinking amongst students. It is against this background that the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), aiming at strengthening the capacity of African agricultural universities and their graduates to transform agriculture and accelerate growth and development of sustainable livelihoods in Africa, undertook several measures to retool university faculty at Gulu and Egerton universities with appropriate skills of engaging communities and conducting research that addresses the needs of smallholder farmers, and that facilitates entrepreneurship development at community level. This paper explores strategies for inculcating the creativity, innovation, and critical and reflective thinking paradigm unto learners for the attainment of lifelong learning abilities.

Key words: Community engagement, Egerton University, experiential learning, Gulu University, TAGDev

Résumé

Partout dans le monde, beaucoup d'institutions d'enseignement supérieures ont entamé des reformes pour rendre les pratiques et systèmes éducatifs plus efficaces pour former un certains types de cadres et diplômés voulus. Le principal but de ces reformes est basé sur l'hypothèse selon laquelle le bienêtre

économique des pays est lié à l'aptitude des citoyens à innover, être créative, analyser et résoudre leur problèmes eux même. Parmi les différentes réformes entamées, il y a l'abandon de la formation des experts spécifiques à un domaine donné pour la transmission d'informations pour la formation des facilitateurs dans le domaine éducatif spécifiquement basé sur l'économie. Le renforcement de la capacité des facultés des universités à travers cette approche pédagogique innovatrice, leur permet d'être apte à délivrer des formations qui aident les diplômés à acquérir la connaissance nécessaire pour agir sur l'économie du pays à travers le renforcement de leur capacités à résoudre des problèmes, travailler en groupe, apprendre à connaitre et pousser leur réflexion. En ce qui concerne les connaissances basées sur l'économie, les universités et facultés coexistent de ce fait pour permettre aux facultés d'adopter les mêmes habiletés développées par les étudiants. Ceci permettra aux facultés d'inculquer aux étudiants des qualités de flexibilités, de travaille de group, de créativité, des pensées intonatives. En plus de ces qualités, il est a noté que la mise en pratique des connaissances acquises au cours de l'apprentissage à l'Université qui implique l'engagement et la collaboration avec communauté pour l' adaptation des connaissances acquises aux réalités de la communauté ne sont pas encore institutionnalisées dans plusieurs universités. Cet état de chose limite les étudiants d'avoir des pensées critiques et de pousser leurs réflexions loin. C'est dans ce sillage que RUFORUM a initié le renforcement de la capacité des Universités agricoles africaines et leurs diplômés
à transformer l'agriculture et accélérer la croissance et le développement durable en Afrique. RUFORUM a aussi entrepris différentes mesures pour renforcer la faculté de l'agriculture des Universités de Gulu et Egerton avec des capacités appropriées qui impliquent l'engagement avec la communauté et la conduite des recherches scientifique qui visent à résoudre les problèmes des petits producteurs et faciliter l'entrepreneuriat et le développement agricole au niveau communale. Cette étude explore différentes stratégies pour inculquer la créativité, l'innovation, la réflexion critique et avancée des étudiants pour l'acquisition des savoirs durables.

Mots clés : Engagement communautaire, apprentissage par expériences, Université de Gulu, Université d'Egerton, TAGDev

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Background

Agriculture is vital for economic development due to the prodigious dependency of Africa's populace on agriculture and the greater multiplier effects of the agricultural sector in benefiting the poor as compared to the non-agricultural sectors (Cervantes-Godoy and Dewbre, 2010). However, for agriculture to translate into economic development, reforming and transforming higher education systems in Africa is highly needed in order increase Africa's competitiveness while ensuring sustainable, inclusive systems (Nampala *et al*., 2017). Higher education can partly be transformed through re-engineering University staff in order to provide quality teaching using pedagogical techniques that produce higher learning outcomes for students to achieve a shift from subject-centered to student-centered learning; from passive to active learning; from memorization to understanding and original thinking; from information and mental engagement to the development of the whole person; from academic and theoretical to life-centered knowledge; from fragmented to integrated knowledge; and from creating standardized products to fostering the development of resilience, individuality and creativity (Imbuga, 2018). All this can be achieved through provision of the needed expertise in science and technology, including intermediate and higher level academic, vocational and technical skills.

Transformation of African higher education are warranted due to the fact that the educational systems that were designed during the 19th Century are not fit to satisfy the demands of the 21st century (Bellanca and Brandt, 2010). Furthermore, universities aver to be champions of change and yet they are themselves criticized for being resistant to change (Smyth *et al*., 2018). To counteract these dilemmas, several ideas emerged including the creation of new universities, taking on the model of EARTH University in Costa Rica with emphasis on community engagement and entrepreneurship (Zaglul, 2016). However, relevancy of African higher education can still be achieved through adoption of innovative approaches that integrate research, teaching and community engagement, thereby eliminating the syndrome of "memorization-learning" which emphasizes theoretical study at the expense of practical experience (Ochola *et al*., 2013). Inculcation of innovative approaches could be achieved through retooling university faculty in transformative curriculum development, and thereby triggering several modifications in the curricula including structuring, description, and integrating courses in community engagement, field attachment, and, experiential learning (Kalule and Ongeng, 2016). This is beneficial in that universities are then able to produce fit-for purpose graduates exhibiting better employability skills; enhance university connectedness to the community; eschew importation of human resource by training its own people; and ultimately improve community livelihoods.

This paper therefore elaborates on the approaches for inculcating skills and knowledge that could improve the teaching methods geared towards producing graduates with real life experiences in addressing actual community needs.

Community engagement

Community engagement is a process which provides the foundation for shared decision-making where communities influence options and the decisions that are taken; shared action where communities contribute to any action taken as a result of the engagement process; and, support for community-led action where communities are best placed to deal with the issues they experience and are supported to take the lead in providing a response. The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) advances the public purposes of member universities by deepening their ability to educate students for responsible citizenship in ways that both deepen their education and improve the quality of community life. For a long time, teaching in many universities and especially in developing countries was conducted in isolation of issues that affect the immediate communities. As a result, universities were heavily criticized for not extending their significant resources to relevant community, social and national issues (Kalule *et al*., 2016). However, in the last few decades several higher education institutions have experimented with engaging communities in the generation and dissemination of knowledge. University community engagement takes different forms including service-learning; community-based participatory research; community-responsive clinical and population based care; and, community service, outreach and advocacy. Whichever form it takes, the aim is often for mutual and reciprocal partnerships (Khalaf, 2017) where each party benefits from the relationship. Before undertaking community engagement preparation is very critical for success to be achieved by the parties engaged.

Preparation for community engagement. For any community engagement to be successful, it is critical that the key actors be identified including their roles and responsibilities. These actors are basically university faculty, students, and the communities as indicated in Table 1.

Table 1. Key actors and their roles in community engagement process

University Faculty	Students (undergraduate & postgraduate)	Community (farm families, organizations and industries)
Develop learning objectives and disseminate knowledge to the students before and after the engagement	Interact with farmers and industries and share knowledge and skills acquired	Willingly work with the students during theengagement
Identify placement opportunity	Identify problems facing industry and farmers and respond appropriately	Mentor students and share experience and knowledge with them
Place student in the community and provide technical backstopping	Gather enterprise-specific problems and transmit them to the faculty for further research	Relay problems requiringattention to student and faculty
Set research priorities	Identify research issues and target study sites	Identify developmentchallenges that need to be addressed and communicate to policy and research

The actors identified need to be engaged in the community engagement process while following the guiding principles of adult learning. These principles need to be understood by the university lecturers and amongst these includes the need to know the benefits, values and purposes of a learning programme; there needs to be active and practical participation; implementable techniques needs to be recommended to achieve immediate outcomes; training needs to be contextualized; and, participants need to be involved in the planning, evaluation and consultation about their own learning process. After the guiding principles have been clarified, the key actors in the engagement process need to be identified. Following this, is the selection and contacting suitable field work sites for engaging the students. In the selection of the best placement for student attachment, a checklist needs to be exploited to ensure that students' needs (ability to work under the available risk) and the site's needs are fulfilled during the training by clearly delineating the role of each stakeholders in the realization of the student's training. Once the faculty has found and accepted a suitable placement site, a formal agreement on the standard template for such student placement is made between faculty and training institution. The agreement indicates acceptable level of liability protection.

Student placement under community engagement. This is the most fundamental stage in the attachment process and involves; setting priorities and scoping to serve the interests of the parties in the collaboration; matching students and their hosts to align the interest of the student to the interest of the identified industry or farmer to which they are attached; getting to and from the farms/ industry where it is the responsibility of students to get to the attachment sites through several means including bicycles and by foot for near-by farming households. The student then interacts with the farmers/ Industry in a two-way communication process to tap into their valuable knowledge and long-lasting experience in relation to crop and animal/ product production, whilst the student benchmarks the information provided to support the farmer/industry in the process. To obtain insight into the challenges faced, lessons leant and recommendations for the field attachments during the attachment, forum sessions need to be held between university supervisors and students in the 4th

and 8th weeks of the field attachment. The role of university supervisors is to guide the students in a reflection process amongst themselves before giving feedback to the university and community.

Student supervision under community engagement. This is facilitated by making use of an "internship learning plan" consented to by the students, site supervisor and university supervisors, as an acknowledgement that the student has been advised of all the requirements associated with the training, including the associated risks and the corresponding relevant insurance cover. The internship learning plan encompasses student learning objectives; site risks; and, agreement to the status quo. Apart from the insurance cover, a risk management plan could be exploited and encompasses several components including; sensitization of students on their roles and responsibilities; selecting and contacting the best fieldwork sites available; providing tips/skills for engaging with communities and/or multistake platforms and, understanding and addressing risks.

Assessment of community engagement. Evaluation of community engagement is undertaken through triangulation and involves site visits, phone call and or both following a predetermined evaluation criteria, and is composed of two processes: a) Assessment by the supervisor and the farmer's assessment, which constitutes 60% (Table 1); and assessment of the final report which constitute 40% (Table 2). The farmer assesses the student on several elements including attendance, with a target of spending at least five (5) days per week on the farm/industry; satisfaction with the content of the information/advice; and, attitude of the student. The rating by the farmer can be undertaken by for example putting two sticks on the ground where one end represents 0 and the other end represents 5, and the farmer has to place a stone between those sticks to visualize satisfaction. The supervisor assesses the student directly on several aspects including demonstrated preparation to four forums; demonstrated write-ups in the logbook encompassing a reflection on the entire attachment period. Supervisors need to hold at least four individual discussions with students on the fieldwork (2 per month). The discussions need to be centered on the major research findings of the students as well as the emerging immediate student outcomes of the attachment.

Table 2. Framework for grading farmer/industry and staff supervision during community engagement

Item	Source and means of verification	Indicators	Maximum no. of % points (out of 60)
Indirect assessment			
Attendance/ fieldwork	Supervisor asks farmer/ industry supervisor to rate student attendance on scale 1-5 (1-5 equals 5 days per week)	Scale 1-5:1 = 3 points, 2 = 6 points etc.	15
Farmer/industry satisfaction with contents of information/ advise	Supervisor asks farmer/ industry supervisor what final recommendations student has given, and then rate satisfaction on scale 1-5 (1 is very dissatisfied, 5 is very satisfied, 3 is just satisfactory)	Scale 1-5:1 = 2 points, 2 = 4 points, 3 = 6 points, 4 = 8 points, 5 = 10 points	10
3. Farmer/ industry satisfaction with students attitude	Supervisor asks farmer to rate satisfaction with students attitude on scale 1-5 (1 is very dissatisfied, 5 is very satisfied, 3 is just satisfactory)	Scale 1-51 = 1 point, 2 = 2 points etc	5
Direct assessment			
4. Preparation of the forums in relation to reflection and joint learning on communication with farmers/ industry supervisor, results and methods of fieldwork findings	Supervisor checks logbook prior to forum discussions with peers	Student has answered questions set prior to every forum in logbook for him/herself: Rate on scale 1-5	10
5. Logbook write-ups after each field visit	Supervisor checks logbook randomly and regularly (at least 4 times) if write-ups are regular and complete	Write-ups are regular and cover at least: reflection on communication with the farmer/ industry supervisor; fieldwork findings; preparation for the next field visit: which questions arise and which activities to perform to answer those questions): Rate on scale of (1-5)	0
6. Individual discussions with students	Supervisor discusses individually with student at least 4x	Student demonstrates: he has done new fact finding on crop/ animal production; evolving ideas about farm/ industry management & business opportunities; student explains what he/she has done on the farm/ industry in presence of the host. Rate scale 1-5.	15

Avenues for increasing community engagement in research, teaching and in community services. Research, teaching and community service are the core mandate of several higher education institutions on the African continent, as part of attempts to ensure that universities engage the beneficiaries of the emerging research outputs. University faculty who exemplify the ideal of community engagement assimilate it into their teaching and their research/scholarly/creative activities as well as those activities traditionally categorized as "service."

At each of these spheres, community engagement is bound to occur employing different approaches. For instance, at the service level, community engagement includes personal or professional outreach

or involvement, especially when it takes place in partnership with groups and organizations outside the university and harnesses a faculty member's skills or expertise to contribute to the well-being of communities and individuals. Community-engaged teaching includes service learning and other forms of problem-based, active and experiential learning aimed at helping students acquire, use, or apply knowledge, ideas and skills in ways that shed light on social, civic or ethical problems or contribute to the well-being of communities and individuals. It also involves groups and organizations outside the university as partners, stakeholders and beneficiaries.

Community-engaged research on the other hand, refers to a research partnership between Universities and communities that is mutually beneficial and includes some degree of shared decision making and leadership between communities and universities. At each of these phases, several mechanisms can be employed to increase community engagement at the respective stages, as indicated in Table 3.

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Retooling in experiential learning (EL). Embedded under community engagement, is experiential learning whereby people individually and in association with others, engage in direct encounter, then purposefully reflect upon, validate, transform, give personal meaning to and seek to integrate their different ways of knowing. Designing an experiential learning session is critical, and basically involves; climate setting to induce participants to begin thinking about the subject at hand; presenting the learning objectives to the learners; delivering an interactive presentation as a precursor for the participants to share experiences; experiences that act as learning points; reflecting on the experiences; generalizing the learning experiences; applying the learning experiences; and closure of the training session (Fig. 2). Experiential learning is integrated in teaching through internship opportunities to enable students attempt a job usually with an experienced professional in the field to act as a mentor; project-based learning encompassing utilization of real world work assignments on time limited project to achieve mandated performance objectives and to facilitate individual and collective learning ;and, problem-based learning, an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem. Assessment of experiential learning is undertaken through student-involved record keeping for instance creation of portfolio that documents student progress over time; and student involved communication to allow students present their learning to an audience, such as with an exhibit or conference.

E-case studies as a form of experiential learning. Case studies are a method of learning aimed at enabling students apply their learning to real life scenarios from which they draw lesson, and generalize to bigger settings. Case studies have been in use since time immemorial and have therefore undergone revolutionization by incorporating information and communication technology (ICT). This is attributed to the fact that majority of the learners have become inseparable from such devices as mobile phones, tablets and laptop that serve as channels for engaging with the world. With the click of the button or swiping of the screen, the learner can access much more material than the trainer can deliver in class. To adapt to these changes, trainer must change from being instructors to facilitators of learning. They must also increasingly adopt blended teaching methods, as well as take advantage ICT and associated devices to instil excitement into learning and thus divert the learner's attention from many social media activities.

Table 3. Grading of the final community engagement report

Item	Indicators	Maximum no. of % points (out of 40)
1. Introduction	Objectives of field attachment clearly described. Farm/industry briefly typified. Context of farm/ industry briefly described geographically, topography, economically, culturally/politically.	5
2. Crop/animal production/ Industrial production: current state	Total size + enterprise lay out & size including map. Per enterprise: good description of size plots/no animals, type & volume inputs, outputs in terms of quantity/quality according to students own, farmers and buyers/ consumers observation. Per enterprise: good description of main activities and who does what.	4
3. Crop/animal/product production: challenges	Good description of challenges experienced by farmer/industry in crop/animal/ product production (each enterprise), why and possible solutions proposed by the farmer. Good description of what student sees as challenges and possible improvement in crop/ animal/ product production (each enterprise).	4
4. Crop/animal/ product production: recommendations and farmer's/ industry reaction	Good description of main feasible recommendations in improving crop/animal/product production, that logically follows from previous chapter Good description of the farmer's/ industry's view in relation to these recommendations and how farmer/industry views feasibility, usefulness	4
5. Farm/ industry operations including management, specific activities performed by student	Good description of farm/ industry management including management structure & task division; ownership assets/revenues; Revenues, expenses and profitability per enterprise division; ownership assets/revenues; Revenues, expenses and profitability per enterprise functioning of accounting systems; risk assessment by farmer; access to and source of information (technical and market information); connection to networks; availability and information (technical and market information); connection to networks; availability and information (technical and market information); connection to networks; availability and	6
6. Farm management: challenges	Good description of challenges as experienced by farmer on farm management, why and his/ her own perception of possible solutions Good description of possible improvements on farm management proposed by student on farm management, why and how	4
7. Farmy/ industry management: recommendations and reaction	Good description of main feasible recommendations in improving farm/ industry management, that logically follows from previous chapter Good description of the farmer's view in relation to these recommendations and how farmer views feasibility, usefulness	4
8. Most important business opportunities	Good description of criteria farmer/ industry uses to develop/produce new crops/animals (enterprises) or improve existing ones Good description of discussion with farmer on main business opportunities he/she sees on developing/producing new crops/animals or improve existing ones Good description of discussion with farmer on business opportunities beyond on developing/ producing new crops/animals or improve existing ones	4
9. Conclusions	Good description of main conclusions taking into account the farmer's view	2
10. Organisation of the report	Good organization of the report including correct spelling; correct formatting style (font 12, alignment, spacing 1,5); correct use of numbering; Correct use of visuals/tables; readable language; and, a maximum number of pages-50	2
11. Summary	Good summary of maximum 300 words. In a good summary, all main points from each chapter are covered	1

Table 4. Avenues for increasing community engagement in research, teaching and in community services

Research	Teaching	Community services
Brand research aptly to secure demand	Develop multidisciplinary proposals	Leverage the visitation fees to address financial constraints
Establish a rewarding system for staff involved in community engagement	Develop a reward system that recognizes engagement with private sector and development partners	Strengthen infrastructure in order to foster collaboration constraints
Involve the community in setting the research agenda	Work with stakeholders to strengthen development partners	Motivate staff through better compensation, training constraints
Recognize communities that have collaborated with the university	Coordinate projects to minimize fatigue in communities	Enhance follow-up and documentation to attract more in communities
Recruit graduate students (PhD/MSc) to undertake research with communities	Undertake structured and coordinated in communities	
Manage the procurement process to facilitate the research division	Utilize local students to overcome socio-cultural barriers	
Encourage staff to source for funding for community engagement initiatives		

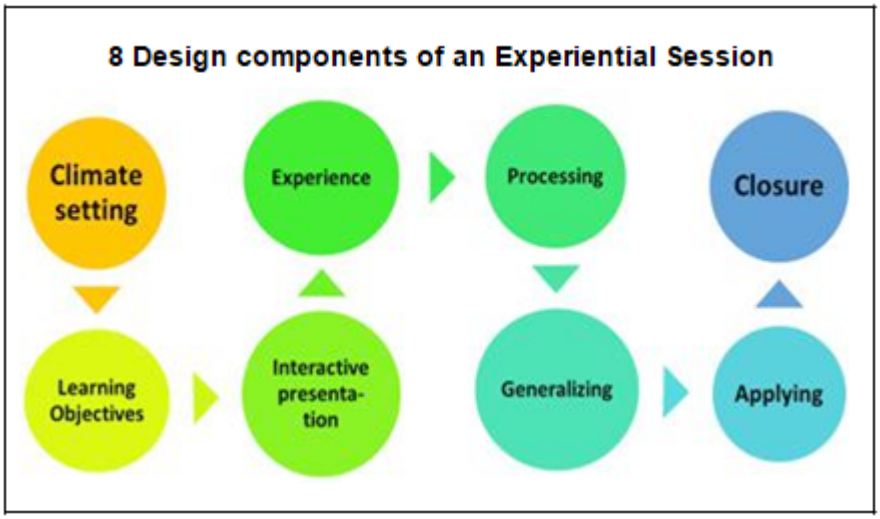

Figure 2. Design components of an experiential learning session

Case teaching is a training technique aimed at facilitating development of learner's critical thinking and problem-solving skills, and it involves; conceptualization of the problem; case development; preparation of teaching/usage notes; facilitation of learners; and, evaluation of skills gained. *The conceptualization of a problem phase involves* formulating a case that is suitable in stimulating learners to use the knowledge they already have, in articulating the problem. A realistic problem impresses on learners how useful potential lessons ensuing from tackling it, are likely to be. They will also see it as time well spent if they can judge the case as advancing attainment of subject's/topic's learning goal and objective. Following *problem conceptualization*, case development ensues and involves innovative use of ICT to

support a build-in of important resources (assets) into the case, and as well enable E-study for blended learning, and for flipped classrooms. This could be facilitated through exploiting two two different experts, including the content expert (subject matter specialist) and the case builder (experts in digital technology). The content expert then develops usage notes to serve as a guide to other instructors that may find the case useful, and encompass background to the case; conceptual framework; the concepts applied in the case; module layout (for e-case); suggested use; guide/advice on how the student should prepare for the case; suggest resources that may be used with the case (journal articles, books, videos); explain how the case ends; key lessons the learner should derive; and, a general discussion question. The case study session is concluded with facilitation using various andragogic approaches, including: question prompts, elaborative interrogation, brainstorming teams of 6-8 learners, and, role modelling to stimulate active learning by assigning learners with significant responsibility of steering their own learning, with the instructor serving as a coach. This is all aimed at empowering learners, and facilitate acquisition of interpersonal and communication skills.
Table 4 shows

Conclusion

Overall, success of innovative pedagogic/learning practices including community engagement, experiential learning and the use of case studies relies heavily on the capability of university faculty. Although the context considered herein is Gulu and Egerton University, many of the elements embedded with respect to retooling of university faculty are applicable to several African universities in to spur transformation of higher education on the continent. This is attributed to the staffing challenges that befall several African Universities. Thus, many of the key issues identified and discussed in this paper with respect to enhancing capability of faculty to implement innovative pedagogy apply to several other universities on the African continent. Specifically, faculty engaged in the design and implementation of innovative pedagogic approaches need to take cognizance of the key instrumental components presented in Figure 2 that established the success of the programme reported in this paper.

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