S. Afr. J. Agric. Ext. Von Maltitz & Van Niekerk
Vol. 51 No. 4, 2023: 210-229
10.17159/2413-3221/2023/v51n3a15587 (License: CC BY 4.0)

Undergraduate Agricultural Extension Qualifications in South Africa: Comparing Available Curricula to Desired Skills and Competencies

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ABSTRACT

Globally, the need for the agricultural extension profession to change from a top-down, production-focused approach to a more participatory and holistic approach has been reiterated. Different stakeholders in South Africa have criticised the public sector service delivery efficiency. To enhance the standard of service, the South African government has specified that every person employed as an agricultural extension worker in the public sector should have a minimum of a bachelor's degree. The department has made much progress. Currently, 73% of all extension professionals in the public sector have a minimum of a bachelor's degree. Despite this, the department still highlights training as inadequate regarding the profession's needs. A proficient agricultural extension sector is vital in assisting farmers in dealing with challenges and enhancing food security. This article examines the available undergraduate bachelor qualifications in agricultural extension in South Africa to determine their relevance in the competencies and skills required by the profession. The curriculum evaluation and improvement model is used as methodology, and coding is used as an analytical tool. The results show that available curricula are still excessively focused on technical subject matter and expertise, and there is an urgent need for updating curricula to be more relevant to the profession's needs.

Keywords: Agricultural Extension, Curricula, Bachelor's Degree, Skills, Competencies.

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1. INTRODUCTION

Producing food and earning a profitable income from it requires knowledge and skills that must be adapted from time to time to adjust to changing circumstances to be sustainable and resilient (Pitt, 2021). Agricultural knowledge and skills are gained through a variety of methods. These include learning from other, more experienced farmers, attending training days offered by the public and private sectors, formal education, printed media, and, more recently, through information and communication technologies (ICTs) (Meyer, 2000). Agricultural extension is an essential provider of knowledge and skills to farmers. Traditionally, agricultural extensionists were primarily tasked with imparting technical skills to farmers to enhance their production. This is typically called the top-down or linear approach (Hlatshwayo & Worth, 2019; Davis & Sulaiman, 2014). This approach ignores that farmers have a broad scope of experiential knowledge that could be beneficial to take note of. With time, the demands for extension services have changed and evolved into an all-encompassing, facilitatory service. It includes linking different role players in the industry and conveying research results and innovation to farmers to increase their productivity and sustainability. Extensionists are not only involved in communicating new production techniques and technological advancements but also in conveying record-keeping methods and increased efficiency in product marketing through continuous contact within the industry. They also facilitate interaction between service providers and farmers, farmers, and governments, and vice-versa (Birkhaeuser *et al*., 1989). Public sector agencies, nongovernmental organisations (NGOs), producer organisations, and private companies such as input suppliers employ extension professionals.

The efficiency of public agricultural extension services globally and in South Africa has been criticised and questioned by many (Davis & Terblanche, 2016; Davis *et al*., 2020; Stevens, 2017). Research results have been diverse, from significantly positive to disappointing. In addition, the latest Draft Review of the National Framework for the Minimum Norms and Standards for Extension and Advisory Services in Agriculture (DALRRD, 2020) concludes that extension practitioners' training is inadequate and extension staff lacks professional expertise and practical experience. However, participants from focus groups in a study done in 2022 highlighted that the curricula should not always be to blame but rather followed up by practical training (Van Niekerk, Von Malitz & Davis, 2022).

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A previous Norms and Standards for Extension and Advisory Services in Agriculture document already published in 2005 stipulated:

> *"A person employed as an agricultural extension or advisory services officer at all levels shall be required to have a minimum qualification of a bachelor's degree or equivalent in training and experience; a strong commitment to higher education; and the willingness to assume responsibility and demonstrate competence. The extension officers or advisors who wish to follow the specialist stream (e.g. agronomy) must have higher degrees in the technical field and are encouraged to belong to organisations that will help them to further their knowledge or expertise… Extension and advisory services, therefore, need a cadre of well-trained, dedicated and motivated staff skilled in agricultural production (scientific and technical expertise), business (economics, marketing and financial management expertise), extension and communication techniques." (Department of Agriculture, 2005, p.8)*

To ensure efficiency, extension and advisory staff must be efficient communicators, manage projects independently, manage the required information and knowledge, and be customer focused. They should be skilled in problem-solving and analysis, people management, and service delivery innovation. They should also promote confidence in the department through honesty and integrity (DoA, 2005). The deadline for obtaining the required qualifications was said to be by 2010. The document also highlighted the importance of regularly reviewing agricultural extension professionals' training needs to adapt to changing circumstances and client needs. The following publication of the department was in 2009 (Department of Agriculture, Forestry and Fisheries [DAFF], 2009). Comparative analysis was done by comparing the extension personnel profile to the set norms and standards 2005. This revealed that at the time, of 2210 employed, only 204 extensionists completed training in communication, 238 completed project management training, 140 completed computer skill training, and 143 completed people management and empowerment training.

Since then, the department has done much to reach its 2005 goal. At baseline, 33.2% of the 1082 extension staff employed at the time had a minimum qualification of a bachelor's degree.

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According to the latest information, qualifications held by South African agricultural extension practitioners are as follows:

TABLE 1: Qualifications of South African Agricultural Extension Practitioners by Province

Province	**No. of extension practitioners**	**Qualifications**		**Percentage compliance to norms and standards**
		Less than a bachelor's degree in agriculture	**Bachelor's degree in agriculture or higher**	
Eastern Cape	571	286	285	50
Free State	120	16	104	87
Gauteng	124	4	120	97
Kwazulu-Natal	750	243	507	68
Limpopo	538	104	434	81
Mpumalanga	228	45	183	80
Northern Cape	56	2	54	96
North West	194	15	179	92
Western Cape	71	2	69	97
Total	2652	717	1935	73 (average)

Source: DALRRD (2020)

The statistics in Table 1 show that 717 (27%) of 2652 extensionists have less than a bachelor's degree. Overall, 1935 (73%) of the extension personnel meet the minimum requirement of a four-year degree in agriculture or higher. This implies that most practitioners in the country meet the minimum required qualifications for agricultural advisors. The Eastern Cape has the lowest percentage (50%) of practitioners with a minimum 4-year qualification in agriculture and/or

higher. The Western Cape and Gauteng provinces have the highest rate of practitioners – at 97% each - that meet the requirement set by the Norms and Standards for Extension and Advisory Services in Agriculture, followed by the Northern Cape province at 96% and the North West province at 92%.

In general, the number of graduates from higher institutions in South Africa went from 85 988 in 2000 to 187 721 in 2016. Still, the growth was mainly in the fields of business, economics, and education. In the period between 2000 and 2016, university graduates specialising in the field of agriculture increased from 1.7 to 2.2%.

Despite the increase in the number of extensionists obtaining bachelor's degrees, the department still highlights training as inadequate regarding the profession's needs (DALRRD, 2020). In a report released by the Academy of Science of South Africa (ASSAf) in 2017 on agricultural education and training status in the country, the curricula were criticised for being irrelevant and excessively focused on production. Most curricula lacked practical training and training to bridge the skills-knowledge-practice gap (ASSAf, 2017). Curricula need to be sufficiently career-focused, and the skill set required by extension staff to be efficient is not taught by most available curricula in South Africa (Gadzirayi *et al*., 2020; Polepole, 2018).

The need for improved relevance in agricultural extension curricula is a well-published topic globally. The Global Forum for Rural Advisory Services (GFRAS) was formed in 2010 when several experienced rural advisory services professionals and international development institutions came together to address critical issues in the profession. Through collaboration, they formulated the New Extensionist Learning Kit, providing training in key competencies and skills found to be lacking in the industry (GFRAS, 2017). These include program management, professional ethics, adult learning, knowledge management, facilitation for development, community mobilisation, farmer organisational development, value chains, and agricultural entrepreneurship. Furthermore, a study done by Van Niekerk, Von Malitz and Davis (2022:57-80) recommended that it is crucial that every institution offering agricultural extension training to keep their curricula relevant to meet the needs of the profession and enhance efficiency.

The first higher institution to offer training to potential agricultural extensionists in South Africa was the University of Pretoria, which did so during the early 1940s. Other institutions followed, and agricultural colleges emerged nationwide (Khwidzhili & Worth, 2019).

Today, 25 higher institutions offer some form of agricultural extension training, but only five institutions offer named bachelor's degrees in agricultural extension. The University of Fort Hare (UFH), the University of the Free State (UFS), the University of KwaZulu Natal (UKZN), the University of Mpumalanga (UMP), and the Elsenburg Agricultural Training Institute (EATI) all offer a three-year B.(Agric) in Agricultural Extension. Other institutions provide agricultural extension as a postgraduate qualification, allowing specialisation. However, many South Africans struggle to afford tertiary education, l*et al*one postgraduate studies (StatsSA, 2020). An undergraduate qualification enables students to start the journey they can later expand upon once employed. This study focused on undergraduate qualifications in agricultural extension in the context of the requirements of DALRRD.

2. METHODOLOGY AND MODEL

The curriculum evaluation and improvement model designed by Buker and Niklason (2019) was partially used to evaluate the contents and relevance of the available agricultural extension qualifications. This model involves six steps that are described below:

i. Identify the objectives/outcomes of the program and align appropriate competencies to it.
ii. Map the program curriculum to the identified competencies.
iii. Map the competencies to the course objectives using an educational framework.
iv. Design measures of competency achievement through appropriate assessment strategies.
v. List and review the results of competency assessment to determine if competencies are acquired through the curricula.
vi. Formulate a strategy to address identified issues and concerns to increase curricula efficiency.

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The contents and relevance of the available agricultural extension qualifications listed previously were reviewed in an international study conducted by the Michigan State University African Alliance Partnership (MSU-AAP). Through collaboration between agricultural extension academics at universities in Michigan, Malawi, Kenya, Nigeria, South Africa, and Uganda, core competencies and skills necessary for agricultural extensionists were identified. Different relevant publications and research projects were used to determine the competencies and skills. These included The New Extensionist Learning Kit formulated by the Global Forum of Rural Advisory Services (GFRAS, 2017), What Every Extensionist Should Know – Core Competency Handbook (Suvedi & Kaplowitz, 2016), and Strengthening Agricultural Extension Training in South Asia (India, Sri Lanka, and Nepal) (Suvedi & Sasidhar, 2020).

The eleven skills and competencies identified in the study as critical for modern-age extension professionals are program planning, program implementation, communication and public relations, information and communication technologies (ICTs), program monitoring and evaluation, personal and professional development, diversity and gender, marketing, brokering, and value chain development skills and competencies, soft skills, nutrition skills and competencies, and technical subject matter expertise/skills and competencies (Von Maltitz *et al*., forthcoming): Comparing these competencies and skills to the available curricula contents was conducted with a desktop study and applying coding as comparative method of analysis. Coding allows the analysis of qualitative data into meaningful results. Deductive coding involves the predefinition of a coding framework preceding the data analysis (Linneberg & Korsgaard, 2019). For this analysis, the contents description of each module were expressed as a percentage of the total modules included in the program. If a module focuses on a single competency/skill, a code of 1 is allocated to that competency/skill. In the case of module contents containing more than one skill/competency, ratios were evenly divided between them even though it has yet to be known what the actual time spent on each topic in class was. The codes were then totalled and expressed as a percentage of the whole. For example, the module from the University of KwaZulu Natal: *Designing Extension Projects* with content description: sustainable livelihoods approach; participatory project planning; developing and applying a theoretical framework for research/policy critique was evenly allocated between the competencies of program planning, program implementation, and program

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monitoring and evaluation, giving a weight of 0.33 to each. The results are displayed in Table 2 below.

3. RESULTS

TABLE 2: Curriculum Contents of the Available B.Agric Qualifications Coded According to the 11 Skills and Competencies

Skills and competencies	UKZN	UFH	UFS	UMP	EATI
Technical subject matter expertise: The ability of agricultural extension professionals to demonstrate basic technical knowledge, understand adult learning principles, understand the new technology being promoted, educate community members about various types of risks and uncertainties, educate community members on climate change and climate-smart agriculture, refer to and produce publications, harness and integrate local/indigenous knowledge, and understand the social system under which farming takes place.	56.5%	72.4%	64.3%	68.2%	62.3%
Program implementation: The ability of agricultural extension professionals to coordinate extension programs, demonstrate teamwork and negotiation skills, engage diverse local stakeholders, delegate responsibilities, and follow participatory decision-making in extension work.	11.6%	4.1%	10.7%	6.8%	5.4%
Program planning: Being familiar with the vision, mission, and goals of the national extension service and agricultural development strategies, able to conduct a needs assessment, able to conduct benchmark studies, able to mobilise resources, able to engage local	14.6%	2.1%	3.6%	13.6%	6.2%

stakeholders, and being familiar with administrative and financial rules of respective organisations.					
Marketing, brokering, and value chain development: The ability of agricultural extension professionals to apply brokering/advisory skills in an agribusiness environment with sufficient knowledge of agricultural markets and linkages, facilitate entrepreneurship and link relevant role players together.	8.7%	6.3%	7.1%	0%	13.6%
Communication: The ability of agricultural extension professionals to select appropriate communication methods, respect local culture, prepare work reports, share success stories and lessons learned, use various communication channels to disseminate information about important extension activities and programs, and possess good listening and public speaking skills.	5.8%	5.2%	5.4%	2.3%	5.4%
ICT technologies: The ability of extension professionals to use Microsoft Office, computers, audiovisual aids, mass media, mobile phones, and social media for communication, teaching, and learning.	0%	3.1%	3.6%	4.5%	2.7%
Program monitoring and evaluation: The ability of agricultural extension professionals to understand monitoring and evaluation concepts, conduct monitoring and evaluation of extension programs, develop data collection instruments, apply qualitative and	1.4%	2.6%	1.8%	4.5%	0.8%

quantitative tools to collect evaluation data, analyse data, write evaluation reports, and share results with stakeholders.					
Soft skills: The ability of agricultural extension professionals to use skills including critical thinking, problem solving, time management, stress management, leadership, teamwork, flexibility, self-motivation, interpersonal skills, positive work attitude, collaboration, conflict management, group formation and development, negotiation skills, networking skills, facilitation skills, and creativity to enhance the efficiency and effectiveness of their service.	1.4%	1.1%	1.8%	0%	0%
Personal and professional skills: The ability of agricultural extension professionals to practice principles of good governance, show commitment to career advancement, apply professional ethics in work, follow organisational policies and directives, and demonstrate positive attitudes toward extension work.	0%	3.1	0%	0%	2.7%
Diversity and gender: The ability of agricultural extension professionals to understand the diversity within and among stakeholders, identify their needs, and develop extension programs to benefit and engage women and various social and marginalised groups and do teamwork with diverse staff members at multiple levels.	0%	0%	1.8	0%	0.8%

Health and nutrition and sanitation: The ability to demonstrate knowledge of essential human nutrition, understanding the life-cycle nutritional needs of various household members, crop selection to ensure balanced diets, improving gender relations for increased agricultural production and nutrition, demonstrating post-harvest handling technologies to conserve nutrients in food, having basic knowledge about food labeling, and ability to advise on healthy diets.	0%	0%	0%	0%	0%

From the above analysis, the focus of the agricultural extension qualifications offered at the different higher education institutions is technical subject matter. Program planning, implementation, monitoring and evaluation, and communication skills and competencies are included to a varying extent in all curricula. Marketing, brokering and value chain development, ICT technologies, personal and professional skills, and diversity and gender competencies and skills are included in some curricula, while in others, it is absent. Nutrition skills and competencies are not taught in any of the available curricula. Due to restricted funding and infrastructure constraints, nutritional advice that would traditionally form part of the responsibilities of a health department is often required from extensionists and must be included in their skill set to assist producers in producing food that will contribute to good household nutrition (Keding *et al*., 2022). It must be noted that although there is no dedicated module for it, lecturers perhaps teach personal and professional skills informally in their other modules. Some module descriptions include practical training and field trips but to a limited extent.

When compared to the desired skills and competencies described in the Draft Review of the National Framework for the Minimum Norms and Standards for Extension and Advisory Services in Agriculture, the results are shown in Table 3 (DALRRD, 2020).

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TABLE 3: Comparison Between Existing Qualifications and the Description of an Efficient Agricultural Extension Professional According to the Draft Review of the National Framework for the Minimum Norms and Standards for Extension and Advisory Services in Agriculture (DALRRD, 2020)

Skills and competencies	UKZN	UFH	UFS	UMP	EATI
Technical skills and competencies described in the framework Knowledgeable of the technical aspects of producing a wide variety of agricultural products and/or able to research them. Knowledgeable of climate-smart agriculture.	56.5%	72.3%	64.3%	68.2%	62.3%
Communication and public relations Able to relate with various participants while communicating clearly and appropriately; equipped with relevant interpersonal skills.	5.8%	5.3%	5.4%	2.4%	5.4%
Personal and professional skills and soft skills Client-orientated and customer-focused. Honest and of the highest integrity. Efficient in problem-solving and analysis. Able to manage and encourage people to reach their full potential.	1.4%	4.2%	1.8%	0%	2.7%
Program planning, program implementation, program monitoring and evaluation) Able to execute project planning, management, and evaluation according to specific outputs.	27.6%	8.8%	16.1%	24.9%	12.4%

Able to manage knowledge and acquire and share it with all the relevant stakeholders to enhance productivity and profitability. Competent in in-service delivery innovation.					
Marketing, brokering, and value chain development Able to advise producers on value chain processing and market linkages	8.7%	6.3%	7%	0%	13.6%
Diversity and gender skills and competencies Understanding diversity and inclusivity regarding gender challenges in agriculture, specifically	0%	0%	1.8%	0%	0.8%

Source: Author

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4. CONCLUSION AND RECOMMENDATIONS

The available undergraduate agricultural extension qualifications in South Africa primarily focus on technical subject matter and expertise. Between 56 and 72% of the currently available curricula focus on technical subjects such as animal and plant production. The limited exposure to the other essential skills and competencies is concerning. A graduate must be equipped to assist farmers in more aspects than technical subjects. In many cases, the farmers have more technical expertise than young extensionists. The extensionist can assist with efficient program planning, implementation, monitoring and evaluation. They can help the farmer market his produce efficiently by facilitating value-adding and finding solutions to existing problems. Professional and communication skills form a vital part of efficient service delivery. Networking between skilled farmers and professionals is a crucial function that extensionists must facilitate.

The difference between the available qualifications is also noticeable. For example, a student graduating from the University of Mpumalanga will have a different skill set than a University of the Free State student. It is recommended that the standardisation of the qualifications be facilitated through the collaboration of stakeholders such as the DALRRD, the South African Society of Agricultural Extension (SASAE), the South African Qualifications Authority (SAQA), and the Council of Higher Education (CHE).

Training institutions should achieve a balance between technical subject expertise and the other skills and competencies discussed in this paper. This includes reviewing and renewing technical subject matter modules and keeping them relevant and updated.

The possibility of an internship like the medical qualification in South Africa should be explored. Ideally, such an internship should be at least six months, and students must be exposed to different agricultural environments during that time. In the process, students will gain practical experience relevant to the profession's demands. The focus of the qualifications should be career oriented. There is a need for practical farming skills and knowledge of farming equipment and tools.

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