



Exploring the Decline of Agricultural Science Teachers in South African Schools: A Case Study

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Abstract

The Department of Basic Education in South Africa is experiencing a shortage of Agricultural Science teachers since their numbers are drastically decreasing. Several schools are failing to recruit appropriately qualified Agricultural Science teachers. This decline seems to be worsening annually. It is not peculiar to the Kwa-Zulu Natal Department of Education Kwa-Zulu Natal province only but seems to be a national phenomenon. This study aims to identify and analyse the causes of the decline of Agricultural Science teachers in the Provincial Department of Education. A qualitative method of research was employed. Data was collected by interviewing respondents on either cell phones or telephones. The findings revealed severe shortages of Agricultural Science teachers in Kwa-Zulu Natal schools. However, it is not peculiar to the Kwa-Zulu Natal Department of Education only, but it seems a national phenomenon. The study recommended, among other things, a clear line of the communication channel between the national Department of Basic Education, Kwa-Zulu Natal Department of Education and the Department of Higher Education and Training to facilitate at local, provincial and national levels, a comprehensive recruitment and training plan for the Department of Basic Education. The study also recommended the introduction of a Bachelor of Education degree with a specialisation in Agricultural Science in some universities, especially in rural areas.

Keywords: *Shortage; Agricultural Science; Teachers; Basic Education; Higher Education and Training; South Africa*

Introduction

Agricultural education is a broad subject grouping comprising Agricultural Sciences, Agricultural Management Practices and Agricultural Technology in the Curriculum Assessment Policy Statement (CAPS). Curriculum and Assessment Policy Statement is a South African curriculum that was implemented in 2012 as an enhancement of the National Curriculum Statement (NCS). Forty-three (43) Agricultural High Schools offer Agricultural Management Practices and Agricultural Technology as

formal school subjects in South Africa. It is the school's responsibility and the Provincial Departments of Education to ensure that there are appropriate resources to offer Agriculture subjects. In comparison, Secondary schools offering Agricultural Sciences are plus or minus 2 500 Secondary Schools in South Africa. In the 2020 academic year, 96 155 candidates sat for Agricultural Sciences in the National Senior Certificate (NSC) Examination. In the same year, 3238 candidates wrote for the Agricultural Management Practices examination, and 1368 candidates sat for the Agricultural Technology examination. Of 96 155, only 69 916 (72.7 %) candidates sat for the Agricultural Science NSC examinations passed. On the other hand, 96.9 % of the 3238 learners who took the Agricultural Management Practices and 97 % of 1368 who took the Agricultural Technology examinations passed (DBE, 2020).

The provincial KwaZulu-Natal Department of Education in South Africa has an appropriately qualified Agricultural Science teachers shortage due to its annual decline. This decline seems to get worse every year. It is peculiar to the KwaZulu Natal Department of Education, but it also appears to be a national phenomenon. The demand for Agricultural Science teachers seemed to be much higher than what is available. García & Weiss (2019) confirmed this statement by stating that this shortage of teachers hurts learners and teachers and the education sector in general. Some schools in KwaZulu-Natal province are phasing out Agricultural Science because they could not attract teachers with Agricultural Science majors. Those who still offer it do not have appropriately qualified teachers to teach it. By suitably qualified teachers for Agricultural Science, we mean those who have a Bachelor of Education (B.Ed.) or Diploma or Postgraduate Certificate in Education (PGCE) with a specialisation in Agricultural Science. A qualification in this subject is fundamental since it equips the teacher with the relevant knowledge, methods, techniques, attributes and skills to guarantee the effective management of a learning area such as Agricultural Science (Bergenske, 2012; Mlangeni, Chibaya & Malinda, 2015). It also teaches the skills necessary for daily operations such as mathematics, science, technology, leadership, communication, and management. The lack of appropriately qualified Agricultural Science teachers continues to cause a decline in enrolment in this subject. For example, in 2016, 106,386 Agricultural Science candidates signed up for the National Senior Certificate exams. In 2017, 98,522 candidates wrote the exams. This number dropped further to 95,291 in 2018, decreased to 92,680 in 2019 and regained in 2021 to 98,522 (DBE 2020, DBE 2022). The following confirms Mbajjorgu, Oguttu, Maake, Heeralal, Ngoepe, Masafu & Kaino (2014), which states that the number of learners pursuing Agricultural Science as a subject at Further Education and Training (FET) Schools and other Agricultural Colleges throughout South Africa has been on the decrease post-apartheid. This study aimed to identify and analyse the causes of the decline of Agricultural Science teachers in the KwaZulu-Natal Department of Basic Education.

The Importance of Agricultural Science as a School Subject

School subject choice influences students' career choices in post-school studies (Anders, Henderson, Moulton, & Sullivan, 2018). Dlamini (2017), in her research, found that some learners who studied Agricultural Science in their secondary schools were often inclined to enrol for post-school qualifications in Agricultural Sciences, which could provide them with opportunities to be self-employed upon completion. Agriculture in KwaZulu-Natal is one of the priority sectors. It is considered an essential element for economic growth, sustainable development and self-sufficiency (Department of Agriculture, 2005). Most communities in the province live on subsistence farming. Some are now becoming more commercialised, and this attempt alleviates poverty and unemployment in the province. Agricultural Science is a critical subject offered in all secondary schools to ensure that citizens are provided with the relevant knowledge and skills to enhance sustainable agricultural production. It is noteworthy that the Nigerian government introduced Agricultural Sciences subject into the general school curriculum at the secondary level as a compulsory subject (Badiru, Aluko & Adejumo, 2019). The plan was implemented to instil love in youths since the number of students who pursued agriculture at a secondary and a tertiary level was declining. Despite this laudable effort of the Nigerian government, previous studies denoted a further decline of youths' involvement in agricultural studies in higher education and reduced interest in Agricultural Sciences in secondary education. It also led to the shortage

of teachers for Agricultural Sciences in Nigeria. Through knowledge and skills attained by teaching Agricultural Science in schools, learners will cascade them to their family members, boosting the stability of food security, household income, and a healthy lifestyle. Agriculture is one of the poverty alleviation programmes offered to youth in the province. For instance, the Department of Agriculture (2005) runs programmes such as ‘one home one garden’, ‘one school one garden’, and ‘one church one garden’ campaigns to alleviate poverty and improve healthy eating.

Agricultural Science is one of the school subjects that teach learners knowledge, skills and attitude that could be used to produce food in South Africa. Learners could use all three factors acquired collectively and respectively at school to earn a living, achieve food self-sustenance, and supplement their income in the workplace. It can enable them to be employed in the agriculture sector or even start their businesses and become entrepreneurs in agriculture (Dlamini 2017). They could, in that way, contribute towards the development of their respective communities.

Causes of Teacher Decline

Welch (2002) identified the causes of teacher shortage in South Africa as the government's inability to attract many young people to train for the teaching profession. Out of those who enrol at the university, some register for economic management sciences, mathematics education, science education, and few enrol for agriculture. However, very few universities offer teaching professions in agricultural sciences or subject didactics in agricultural sciences. One of the findings from a study conducted by the South African Council of Educators (2010) on teacher shortages was that teacher shortage emanates from attrition. The latter includes, among others, death, resignation and retirement. In this case, the decline of Agricultural Science teachers is more likely caused by two factors: a decline in teacher preparation/training and attrition. For example, when the teacher exits the system, either due to retirement, death or seeking green pastures, the department lacks the capacity for replacing such a teacher with appropriately qualified ones due to a shortage of teachers, especially teachers of scarce subjects. Sutchter, Darling-Hammond & Carver-Thomas (2016) aver that four main factors contribute to the teacher shortage across all fields of education, namely, a decline in teacher preparation, effort to reduce teacher ratios, increase in student enrolment and high teacher attrition. Mlangeni, Chibaya, Kaperemera, Kamundi, Malinda & Kapito (2015), in their study in Malawi, found that the shortage of Agricultural Sciences teachers is attributed to high agriculture teacher attrition rate, as more agriculture teachers leave for more lucrative jobs in NGO and private companies. As a result, they used either unqualified or underqualified teachers to teach Agricultural Sciences, and they were ineffective. In the United States, Solomonson (2017), in his thesis, found that the field of Agricultural Science Education has experienced a consistent teacher shortage in the past decades. Therefore, many schools struggle to fill their open vacancies. At the same time, some schools are forced to shut down Agricultural Science subject entirely due to inadequate staffing. The research also indicates teacher attrition as a major cause behind the teacher shortage.

Challenges Associated with Shortages of Agricultural Science Teachers

There are many challenges associated with the shortages of Agricultural Science teachers. For example, the shortfall of Agricultural Science teachers is a challenge that negatively impacts in addressing the skills shortage in agriculture, economic development, poverty alleviation, and achieving social redress in South Africa (Hammett 2008). Some learners do not enrol for Agricultural Science in schools, even if they wish to, just because it is not offered or there are no appropriately qualified teachers to teach the subject. Many secondary school learners and post-secondary school students prefer studying white-collar careers such as business management and undermining others, for instance, the teaching profession (Waithera 2013). That leads to a shortage of teachers, for example, teachers of Agricultural Science and other subjects. A lack of appropriately qualified Agricultural Science teachers impacts negatively learners' ability to learn (Ladd & Sorensen, 2017). The shortage of Agricultural Science

teachers in schools has led to many schools phasing it (Agricultural Science) out. In some instances, schools reduced the number of learners registered for Agricultural Science to avoid a high failure rate in the subject. Therefore, very few schools are now offering Agricultural Science, and the number of Agricultural Science learners is declining each year. This will eventually lead to a decline in the number of students pursuing Agriculture as a profession in higher education.

Method

The study employed a qualitative method of research. It was a descriptive research design that focussed the researcher on collecting in-depth information about the shortage of Agricultural Science teachers in Kwa-Zulu Natal. A purposive sample of respondents (Cohen, Manion & Morrison, 2005), namely, four Subject Advisors, four Circuit Managers and ten Principals, were identified to respond to interview questions because of their relevant knowledge of the current subject teachers and staffing issues in schools generally. Semi-structured questions were set. There were follow-up questions in most interviews. Data was collected using either cell phones or telephones because the researchers mitigated the risks of spreading Covid-19. Their views were transcribed so that they could be analysed and interpreted.

Data Analysis and Interpretation

The study employed Colaizzi's seven-step descriptive phenomenological method (1978), which takes a narrative approach to analyse and interpret data. The researchers started the process by reading the opinions of all respondents several times to familiarise themselves with them. They then identified a relevant phenomenon that arose and gave meaning to it. The researchers did that by reflexively trying to "bracket" their pre-suppositions by avoiding influencing data and thus stuck to the phenomenon objectively and as close as possible. They identified and clustered statements that were regarded as essential and relevant to the research into common themes and gave meaning to them (Colaizzi 1978; Morrow 2013; Morrow, Rodriguez & King 2014). They included demographic information, absence of school teaching programmes that focus on Agricultural Science in Kwa-Zulu Natal universities, shortage of Agricultural Science teachers in Kwa-Zulu Natal province, and failure of schools to recruit appropriately qualified agricultural science teachers in Kwa-Zulu Natal. The process of identifying, clustering, analysing and giving meaning to essential and relevant statements to the research was repeated to ensure that no critical information was omitted. After analysing and interpreting every theme, findings were made and discussed.

Findings and Discussion

It emerged from the participants' findings that there is a shortage of Agricultural Science teachers in schools in KwaZulu-Natal. Several reasons have been cited as the cause. The findings show that the Department of Higher Education and Training (DHET) does not appear to monitor whether some of the courses, modules and/or programmes offered by universities articulate with those offered in formal schools. For example, DHET does not appear to monitor and/or encourage universities to offer certain courses or modules such as Agricultural Science that should be taught formally in schools. DHET does not appear to know and provide the programmes and/or modules that schools need. The Department of Basic Education (DBE), which oversees teaching and learning of different subjects in schools, does not seem to state its needs from the DHET openly. Both DBE and DHET do not seem to "work together" and complement each other. The closure of Teacher Training Colleges and taking over the role of training student teachers to become qualified teachers by universities led to the discontinuation and exclusion of some subjects such as Agricultural Science offered in the former Colleges of Education. Some former Teacher Training Colleges in KwaZulu-Natal used to train student teachers to teach Agricultural Science in schools once they completed the qualification. On the other hand, no single university in KZN is training student teachers to teach Agricultural Science when they complete the teaching programme. This

means that no university offers a certificate, diploma, or degree programme in Agricultural Science, let alone a similar degree offering an Agricultural Science module at KZN. No university offers a Post Graduate Certificate in Education (PGCE) or Post Graduate Diploma in Education (PGDE) focused on Agricultural Science in schools. It also emerged that the shortage of Agricultural Science teachers was a provincial problem and a national problem. Across the country, there is a shortage of universities offering Agricultural Sciences Education. Agricultural Science teachers were last trained when Colleges of Teacher Training were still operating in South Africa. Therefore, the dearth of Agricultural Science teachers is a nationwide problem.

The absence of a Certificate, Diploma, Bachelor's or Degree in Agricultural Sciences and or the inclusion of an Agricultural Science module in the student-teacher programme at the university exacerbates the shortage of Agricultural Science teachers at the KwaZulu-Natal schools. Schools offering Agricultural Sciences in KwaZulu-Natal struggle to recruit appropriately qualified teachers in the subject (Agricultural Sciences). The findings also revealed that students who have completed a Bachelor of Agriculture degree do not appear to be appropriately qualified to teach Agricultural Science because they have graduated in one of the Agricultural Science streams; for example, they were trained in either animal studies, agronomy or agricultural economics. On the other hand, Agricultural Science covers a combination of different themes such as soil science, plant studies, animal studies, basic agricultural chemistry, agricultural economics, basic genetics and biological concepts, agroecology and sustainable use of natural resources. It also emerged that most of the teachers recruited are often able to teach specific aspects of the Agricultural Science with which they are familiar. The findings also revealed that some of these teachers may not have studied Agricultural Science at the high school level because it is not a prerequisite to enrol for a Bachelor of Science in Agriculture. Therefore, these teachers lack content knowledge in Agricultural Science. This adds to the learners' higher failure rate in Agricultural Science because the teacher does not have sufficient knowledge to teach Agricultural Science.

Limitations and Suggestions for Future Studies

The current study focused on secondary schools in KwaZulu-Natal province. The shortage of Agricultural Science teachers appears to be a national problem. A similar study focusing on secondary schools conducted in South Africa could yield better results and scale the problem much better to the national DBE and DHET. As a result, future research should focus on the national deficit of Agricultural Science.

Conclusions

The study revealed that there is a severe shortage of agricultural science teachers. This stems from the fact that no university in the province of KwaZulu-Natal offers a Bachelor's Degree in Education with a specialisation in Agricultural Science.

Even the current serving Agricultural Science teachers are not appropriately qualified because they did not train as Agricultural Science teachers. They either obtained a Diploma in Agriculture or a Bachelor of Science in Agriculture and a Postgraduate Certificate in Education (PGCE). These qualifications do not make them appropriately qualified teachers because they lack basic content knowledge. They have specialised in a single stream, for instance, Animal Science, Agricultural Plant Studies, Agronomy or Agricultural Economics. They have not covered all themes in the Agricultural Science curriculum.

Recommendations

Policymakers must make it mandatory for the Department of Basic Education and Higher Education to regularly meet to discuss their service needs and service standards. They must create clear

channels of communication between basic and higher education. The Department of Basic Education needs to state the service standards they require from universities and the kind of learners they need from schools. Universities are obliged to restructure their undergraduate teacher qualifications considering the Department of Basic Education's needs. The Department of Basic Education must create a database of all undergraduate teaching qualifications to ensure that all teaching subjects are catered for.

Furthermore, the DBE must also create a comprehensive training and recruitment plan for teachers short to long-term. In-service training of current teachers who possess a Postgraduate Certificate in Education (PGCE) and a degree or diploma in agriculture is pivotal to consolidating content knowledge. The inclusion of Agricultural Science as a primary subject or module in the Bachelor of Education degree is paramount.

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