

IN-SERVICE TRAINING NEEDS OF JUNIOR SECONDARY AGRICULTURE TEACHERS IN ESWATINI

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ABSTRACT

The purpose of the study was to find-out in-service training needs of Junior Secondary Agriculture Teachers in Eswatini. The study used a descriptive survey using simple random sampling to get agriculture teachers (n=180). The target population was all Junior Secondary agriculture teachers in Eswatini (N=340). A self-administered questionnaire was used for collecting data. One lecturer from Agricultural Education and Extension Department and two agriculture subject inspectors were used to establish the face and content validity of the questionnaire. The reliability coefficient was found to be 0.92. Descriptive statistics and Borich's model were used to identify the in-service needs for Junior Secondary Agriculture teacher in Eswatini. The findings of the study indicated that Junior Secondary agriculture teachers need in-service training on inclusive education, positive discipline, innovative teaching, incorporating information communication technology in teaching, mushroom production, apiculture and entrepreneurship. Thus, the study recommended that the Ministry of Education and Training should urgently agriculture teachers provide needed in-service training on the identified areas reported in this study.

Key words: *Agriculture teacher, Borich's model, In-service training, In-service training needs, Junior secondary*

INTRODUCTION

Nowadays, change is more rapid and inevitable than ever before due to globalization and technology (Sweat, 2010). Due to this continuous change, people believe that Agricultural Education also needs to change if it is to remain a vital part of a country's education (Roberts and Dyer, 2003). In this changing environment, teachers are expected to embrace themselves with the changes in society and technology (Moeini, 2008). A consensus exists among teachers, business leaders, and policy makers that students should be prepared with 21st century skills to be successful nowadays (Rotherham and Willingham, 2009). As the current students bring different sets of experiences and expectations than in the past, there is a need to equip them with skills in the following areas: ways of thinking, ways of working, tools for working, and skills for living in the world (Binkley et al., 2012; Davis and Jayaratne, 2015).

Changes in technical agriculture, educational technology, teaching, and youth activities have made it necessary for teachers to update their knowledge in subject matter and teachers have chosen in-service training to meet their learning needs (Roberts and Dyer, 2003). This is because teachers are faced with the challenge of providing a satisfactory learning environment and preparing their students for successful lives in today's world (Layfield and Dobbins, 2002). However, many teachers may feel that their skills or knowledge is inadequate for providing students with the necessary skills to face the changing world. With the demands of a fast-paced world, it is evident that teachers must embrace lifelong (Layfield and Dobbins, 2002). In-service training programmes are helpful in preparing teachers to be successful (Joerger, 2002). The changes within the realm of Agricultural Education require that most agricultural teachers are provided

with some form of in-service training on a regular basis to be able to cope with the changing demands of the profession (Roberts and Dyer, 2003).

Most of the in service training was on beginning teachers; thus, Layfield and Dobbins (2002, p. 47) suggested that “*more in service needs assessment research on experienced teachers is necessary.*” In-service training is any vocational training acquired during employment, and undertaking to engage in such training is usually part of the appointment agreement between employer and employee (Mitton-Kükner, Nelson and Desrochers, 2010).

Borich’s need assessment model has been used as a method of identifying Agricultural Education pre-service and in-service training needs assessment. It utilizes a descriptive survey based on the Borich Needs Assessment Likert scale (Joerger, 2002; Layfield and Dobbins, 2002). Borich Needs Assessment Model evaluate the “perceived level of importance” and “perceived level of competence” of teachers regarding professional competencies that were identified by previous research and related to the issues. The Borich’s model uses mean weighted discrepancy score (MWDS) rankings to identify the educational needs of teachers (Borich, 1980). Borich (1980) described a training need as a discrepancy between an educational goal and trainee performance. The model involves designing a survey instrument that would allow one to collect data that can be weighted and ranked in order of priority.

Numerous in-service needs for agriculture teachers have been reported in the literature. These in-service training needs can be categorised into professional and technical skills. Professional in-service training include the following: integration of technology in the classroom and youth/adult development activities (Joerger, 2002; Layfield and Dobbins, 2002); record-keeping skill (Layfield and Dobbins, 2002; Roberts, 2003); supervising students programmes (Layfield and Dobbins, 2002); student management, guidance and motivation (Joerger, 2002); programme planning, development, and evaluating; planning, execution, and evaluation of instruction (Mundt, 1991); teaching approaches or methods (Ekey, 2013; Musukela, Lubbe and Pelsler, 2013); and so on. On the other hand, Duncan, Ricketts, and Peak (2006) presented the following as technical service training needs: small animal or veterinary care, animal biotechnology, and aquaculture, integrating science and other emerging technologies into agricultural education classes. In addition, Melak and Negatu (2012) when studying Agricultural education and technical competency of development agents in Ethiopia found that identifying common plant diseases was an area in which participants needed in-service training.

Sorensen, Tarpley and Warnick (2010) reported the following as competencies needed by agriculture teachers: (a) utilizing the community in providing opportunities for students i.e. advisory committees, agricultural organizations, etc.; (b) developing supervised agricultural experience (SAE) opportunities for all students; (c) identifying and preparing

FFA proficiency award applications; (d) planning and implementing student recruitment activities; and (e) teaching learning disabled students. Similarly, Davis and Jayaratne (2015) pointed at the role of agriculture in global food security; application of problem-based learning; planning and delivering lessons to utilize higher order thinking skills; teaching leadership skills; and development of teamwork and student collaboration as other in-service training needs for Agriculture teachers. Okiror, Hayward and Winterbottom (2017) found that in-service training in Uganda for agriculture teachers was on practical agriculture skills and exposure to the modern farming practices.

Al-Rimawi, Allahyari, and Al-rusheidat (2017) reported that the provision of in-service training is hindered by the availability of finances and transport. Similarly, increased work load, lack of time, lack of funding, and increased personal costs related to in-service training were some of the barriers to attend in-service training for extension agents (Lakai, Jayaratne, Moore & Kistler, 2012).

In Eswatini, the in-service training needs for agriculture teachers were provided by the Emlalati Development Centre (a Government institution under the Ministry of Education and Training); but, has since been stopped. In the past five years, studies on in-service training needs for Agriculture teachers in Eswatini have been done at high school (Ndwandwe, and Dlamini, 2014) and primary school (Sihlongonyane, 2016). Ndwandwe and Dlamini reported that agriculture teachers needed in-service training in innovative teaching, incorporating educational technology in methods of instruction and assessing practical skills and ability. Similarly, Sihlongonyane found that primary agriculture teachers were wanting in the following teaching areas: (i) entrepreneurship skills, (ii) indigenous knowledge on controlling pests and diseases, (iii) mushroom production, (v) assessment of agriculture practical’s, (vi) positive discipline, (vii) use of technology, and (viii) inclusive education.

Dlamini, Mbingo and Dlamini (2003) in a study on “*Innovations Needed in the Swaziland Secondary Schools Agriculture Curriculum*” found that Agriculture Secondary school teachers needed in service training in the following areas: business management, information and technology, water harvesting, storage and irrigation, honeybee keeping, mushroom production, food processing, fish production, farm structures, farm machinery, floriculture, entrepreneurship, land-scaping, and hatchery enterprise. Dlamini (2008) found that Agriculture secondary school teachers needed in-service training on the use of school facilities such as teaching using experiments and using multimedia; agribusiness, soils, environment, public issues, leadership, learning how to teach disable students, upgrading students and keeping current in agriculture, increasing knowledge in agriculture, increasing professionalism, and setting examination. Similarly, Shiba (2010) noted that in-service training needs for Junior Secondary agriculture teachers were on the following areas: practicals in vegetable, poultry, and rabbit production.

Dlamini (2008) reported the following as inhibitors for the agriculture teachers to attend in-service training: distance of school from in-service training; lack of incentives; lack of funds; poor information dissemination; and unsuitable time. Other inhibitors identified by Dlamini were teaching methods and techniques; and the selection, use, and maintenance of teaching aids and farm equipment. Similarly, Shiba (2010) highlighted the following as hindrances for agriculture teachers to attend in-service training: difficult school administration, financial constraints in the schools, and long syllabus. Shiba further found that other factors which inhibit agriculture teachers from attending in-service training were: attitude towards in-service training, unavailability of appropriate institutions, lack of cooperation and coordination between relevant institutions like the University of Eswatini, financial resources, time factor, effectiveness of in-service office to mobilize with relevant institutions for resources needed, lack of methodological approach, lack of appreciation by teachers to continuous education, and no strong policy from government about in-service training.

Existing literature indicated that there is no national study conducted on the in-service training needs for Junior Secondary agriculture teachers in Eswatini. The studies conducted by Dlamini (2008) and Shiba (2010) were focused on the in-service needs for Junior Secondary agriculture teachers in the Shiselweni and Hohho region, respectively. Also, in 2016 a new Junior Secondary agriculture syllabus (Syllaby 2018-2020) was introduced by the Examination Council of Swaziland. This brought changes as new topics like apiculture, fishery and agro-forestry were introduced. Thus, there was a need to determine the in-service training needs of Junior Secondary agriculture teachers in Eswatini post the change of Junior Secondary agriculture syllabus.

The purpose of the study was to determine in-service training needs of Junior Secondary school agriculture teachers in Swaziland. The objectives of the study were:

1. To describe Junior Secondary agriculture teachers by their demographic characteristics and background information,
2. To identify in-service training needs of Junior Secondary agriculture teachers,
3. To identify inhibitors for Junior Secondary agriculture teachers to participate in the in-service training.

METHODOLOGY

The design of the study was descriptive employing a simple random sampling of 180 Junior Secondary agriculture teachers in Eswatini. A questionnaire was used for collecting data on in-service training needs for the secondary agriculture teachers in Eswatini. Two six-point rating scales put side by side against each variable or statement were used to measure the variables of the study. The first scale measured the level of importance and the second scale measured the competence level.

Content and face validity of the instrument were addressed by one lecturer from the department of Agricultural Education and Extension at the University of Eswatini and two agriculture subject inspectors. Thirty agriculture teachers were used to establish the inter-item reliability of the instrument using Cronbach's Alpha. The reliability coefficient was 0.92, meaning the instrument was 92% reliable. Descriptive statistics such as frequencies, percentages, mean and standard deviation were used to analyse the data. Borich's model was also used to identify the in-service training needs by the Junior Secondary agriculture teachers.

FINDINGS AND DISCUSSION

Demographic characteristics and background information

Table 1 depicts that there were more male teachers (n=108, 60%) than female teachers (n=72, 40%). Most of the respondents were aged between 31-40 years (n=94, 52.2%). One hundred twenty respondents (66.7%) were married and 42.2% (n=76) were from government schools. Also, 97 agriculture teachers were from rural schools (n=50, 53.9%). Most of the respondents (n=138, 76.7%) had Bachelor's Degree in Agricultural Education and 33.3% of the respondents (n=60) had at most five years teaching experience.

Table 1. Demographic characteristics and background information of respondents

Items	f	(%)
Sex		
Male	108	60.0
Female	72	40.0
Age		
21-30 years	49	27.2
31-40 years	94	52.2
41-50 years	27	15.0
51-60 years	10	5.6
Marital status		
Single	60	33.3
Married	120	66.7
Type of school		
Community-owned	34	18.9
Mission-owned	31	17.2
Government-aided mission	39	21.7
Government	76	42.2
School location		
Rural	97	53.9
Semi-urban	50	27.8
Urban	33	18.3
Teaching qualification		
Diploma not in Agricultural Education	5	2.8
Degree not in Agricultural Education	11	6.1
Masters not in Agricultural Education	1	0.6
Diploma in Agricultural Education	16	8.9
Degree in Agricultural Education	138	76.7
Masters in Agricultural Education	9	5.0
Teaching experience		
1-5 years	60	33.3
6-10 years	51	28.3
11-15 years	35	19.4
16-20 years	14	7.8
21-25 years	7	3.9
26-30 years	8	4.4
Above 30 years	5	2.8

In-service training needs of junior secondary agriculture teachers

General in-service teacher training needs

Table 2 revealed that inclusive education (MWDS=7.06), parent-school cooperation (MWDS=6.45) and positive discipline (MWDS=3.70) were in-service training needs for Junior Secondary agriculture teachers. Similarly, Ncane (2016) reported that primary agriculture teachers needed in-service training in inclusive education and positive discipline. This implies that agriculture teachers in Eswatini need in-service in these new trends.

Table 2. General in-service teacher training needs

General teacher needs	in-service training	Level of importance	Level of competence	Borich calculation		Rank
				DS	MWDS	
		M	M			
Inclusive education		5.08	3.69	1.39	7.06	1
Parent-school Cooperation		5.47	4.29	1.18	6.45	2
Positive discipline		4.63	3.83	0.80	3.70	3
Guidance for student growth, e.g. abstinence		5.23	4.54	0.69	3.61	4
Extra-curricular Activities		4.92	4.24	0.68	3.35	5
Alleviation of work related stress on students		4.94	4.45	0.49	2.42	6
Overall		5.05	.17	0.87	4.43	

Professional in-service teacher training needs

Table 3 presents professional in-service training needs of Junior Secondary agriculture teachers were on the application of ICT in teaching (MWDS=6.34), using innovative teaching methods (MWDS=5.50), adaptation to new curriculum (MWDS=4.92) and time management (MWDS=3.50). Ndwandwe and Dlamini (2014) reported that agriculture teachers needed in-service training on innovative teaching and incorporating educational technology in method of instruction. Similarly, Dlamini et al. (2003) and Sihlongonyane (2016) conducted a study on in-service needs in the use of technology to teach agriculture.

Table 3. Professional in-service teacher training needs

Professional in-service teacher training needs	Level of importance	Level of competence	Borich calculation		Rank
			DS	MWDS	
		M	M		
Application of ICT in teaching	5.28	4.08	1.20	6.34	1
Innovative teaching methods	5.56	4.57	0.99	5.50	2
Adaptation to new curriculum	5.47	4.57	0.90	4.92	3
Time management	5.47	4.83	0.64	3.50	4
Self-assessment	5.19	4.62	0.57	2.96	5
Classroom management	5.44	4.90	0.54	2.94	6
Teaching of subject-specific knowledge	5.39	4.93	0.46	2.48	7
Effective evaluation of student progress	5.32	4.86	0.46	2.45	8
Overall	5.39	4.67	0.72	3.89	

Technical in-service teacher training needs

Table 4 shows that biodiversity (MWDS=5.80), apiculture (MWDS=5.75), management of agro-forestry (MWDS=4.37),

farm business activities (MWDS=3.55), agriculture programmes (MWDS=3.24), pasture management (MWDS=3.09) and desertification (MWDS=3.00) were the technical in-service training needs for the Junior Secondary agriculture teachers. Existing literature indicate that in Eswatini, agriculture teachers need in-service on mushroom production, apiculture and entrepreneurship (Dlamini, et al. 2003; Ndwandwe and Dlamini, 2014; Sihlongonyane 2016). Previous research also reported that agriculture teachers needed in-service training in the assessment of practical lessons (Dlamini, et al., 2003; Okiror, et al., 2017; Sihlongonyane, 2016); however, this study did not identify the assessment of practical lessons as an in-service need anymore. Effectively, it means in-service training providers such as agriculture subject inspectors have been to school to equip teachers with the skills necessary for the assessment of practical lessons.

Table 4. Curriculum content in-service teacher training needs

Curriculum content in-service training needs	Level of importance M	Level of competence M	Borich calculation		Rank
			DS	MWDS	
Biodiversity	5.32	4.23	1.09	5.80	1
Apiculture	5.04	3.90	1.14	5.75	2
Management of agro-forestry	5.14	4.29	0.85	4.37	3
Farm business activities	5.38	4.72	0.66	3.55	4
Agriculture programmes	5.15	4.52	0.63	3.24	5
Pasture management	5.33	4.75	0.58	3.09	6
Desertification	5.46	4.91	0.55	3.00	7
Processing and storage	5.46	4.93	0.53	2.89	8
Cattle	5.51	4.99	0.52	2.87	9
HIV/AIDS	5.43	4.92	0.51	2.77	10
Goats	5.36	4.86	0.50	2.68	11
Climate	5.53	5.06	0.47	2.60	12
Pollution	5.44	5.02	0.42	2.28	13
Farm implements	5.42	5.06	0.36	1.95	14
Growing field crops	5.62	5.36	0.26	1.46	15
Chickens	5.70	5.45	0.25	1.43	16
Land preparation	5.55	5.31	0.24	1.33	17
Rabbits	5.30	5.06	0.24	1.27	18
Agricultural tools and safety	5.46	5.24	0.22	1.20	19
Soil fertility	5.59	5.38	0.21	1.17	20
Farming systems	5.49	5.30	0.19	1.04	21
Soil erosion	5.64	5.46	0.18	1.02	22
Management of vegetables	5.56	5.42	0.14	0.78	23
Soil texture	5.49	5.35	0.14	0.77	24
Soil structure	5.54	5.42	0.12	0.66	25
Plant processes	5.38	5.27	0.11	0.59	26
Land use	5.37	5.27	0.10	0.54	27
Overall	5.43	5.02	0.42	2.23	

Inhibitors for effective in-service training for Junior Secondary agriculture teachers

Table 5 shows that the following were factors inhibiting junior secondary agriculture teachers from attending in-service training: lack of funds from school (M=4.52, SD=1.42), teaching overload at school (M=4.46, SD=1.40), difficulty in taking time from the job (M=4.27, SD=1.40), late information on in-service training (M=4.17, SD=1.41), in-service training located too far (M=4.03, SD=1.58), unsuitable time for in-service training (M=3.98, SD=1.43), lack of incentives (M=3.94, SD=1.67) and no award of certificates (M=3.60, SD=1.64). The study supports the research by Dlamini (2008) and Shiba (2010) that that distance of school from in-service training, lack of incentives, inadequate of funds, poor information dissemination, and unsuitable time were the factors inhibiting teacher participation on in-service training programmes. Similarly, the provision of in-service training is hindered by the unavailability of transport, increased work load, lack of time, and lack of funding (Al-Rimawi, et al., 2017; Lakai, et al., 2012). Therefore, a need exist to address these factors hindering the participation of Junior Secondary agriculture teachers in order to enhance the effectiveness of in-service training in Eswatini.

Table 5. Factors that inhibit teachers' attendance in in-service training

Inhibitors	M	SD
Lack of funds from school	4.52	1.42
Teaching overload at school	4.46	1.40
Difficulty in taking time from the job	4.27	1.40
Late information on in-service training	4.17	1.41
In-service training location were too far	4.03	1.58
Lack of incentives	3.94	1.67
Unsuitable time for in-service training	3.98	1.43
No awards of certificates	3.60	1.64
Sessions non-informative	3.07	1.42
Fear to fail examination	2.69	1.42
Lack of in-service relevance to the job	2.93	1.38
Lack of interest	2.51	1.46

NB: Scale - 1=strongly disagree; 2=slightly disagree; 3=disagree 4=agree 5=slightly agree 6=strongly agree. **Interpretation** - Mean value less than 3.5 means is not an inhibiting factor while mean value that is 3.5 and above means is an inhibiting factor.

CONCLUSIONS AND RECOMMENDATIONS

Generally, agriculture teachers at all levels have in-service training needs on inclusive education, positive discipline, innovative teaching, incorporating information communication technology in in teaching, mushroom production, apiculture and entrepreneurship. In addition, the Junior Secondary agriculture teachers also needed in-service training on the following: parent-school cooperation, adaptation to new curriculum, time management, agro-forestry management, agriculture programmes, pasture management and desertification. Effective in-service training

for agriculture teachers was hampered mainly by the following: lack of funds from school, teaching overload at school, difficulty in taking time from the job, late information on in-service training and in-service training located too far agriculture teachers.

Therefore, this study recommended that training institutions should ensure that agriculture teachers be considered for the needed in-service training on the key areas identified in this study. Furthermore, the Ministry of Education and Training through the In-service Training Department or Agriculture Inspectorate should address the inhibitors identified by the study for effective in-service training in Eswatini.

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