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Analysis of linkages between the primary and junior secondary schools agriculture curricular in Botswana

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ABSTRACT

The purpose of this study was to describe the linkages that exist between the primary school and junior secondary school agriculture syllabi in terms of subject matter contents, goals, objectives and the cognitive domain of learning in selected topics. The study used mixed method whereby content analysis and a survey technique were used. The primary school and the junior secondary school agriculture syllabi in Botswana were analyzed, while 50 in-service agriculture students at Botswana College of Agriculture were surveyed using a pre-structured and validated questionnaire regarding linkages of curricular. The results of the study indicated that the primary school agriculture syllabus had 18 topics comprised of 127 instructional objectives while the junior secondary schools agriculture syllabus had 17 topics comprised of 445 instructional objectives reflecting that more topics were included in primary school syllabus as compared to junior school syllabus. However, the findings revealed that Biotechnology was not taught in secondary schools. The results also revealed that in primary school curriculum, the topic on soils has been broken down into several components while in the junior secondary education syllabus only one component is taught 'soil fertility'. The majority of the objectives outlined in the syllabi were at lower level of the cognitive domains comprising knowledge, application and comprehension. It was concluded that the linkage between the two syllabi was not strong and therefore, a review of both the syllabi for proper alignment was recommended towards the enhancement of effective learning process.

Keywords: Agriculture curriculum linkages, primary schools, junior secondary schools, content analysis, instructional objectives, teacher's perceptions, Botswana.

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INTRODUCTION

Curriculum continuity in the education is one of the crucial elements particularly in the understanding of how and what people learn in schools (Chapman, 2002). Martin (2008) explained the concept of continuity as 'concerned with ways in which the education system structures experience and provides sufficient challenge and progress for pupils in a recognizable curricular landscape' (p.5). It is further explained in terms of the progression which describes learners' personal pathways in education whereby they acquire, hone, apply and develop their skills, knowledge and understanding in increasingly challenging situations' (Martin, 2008:6). The understanding is that progression depends on procedural and conceptual knowledge acquired through classroom instruction and/or beyond. It is from this background that Bonus (2014) believed that to design a curriculum takes into consideration the horizontal and vertical organizations. The author further stated that vertical arrangements refers to the longitudinal arrangements of subject matter contents as mirrored in the sequencing of both skills and contents under study. On the other hand, the horizontal organization of a curriculum refers to the arrangement of subject matter contents, skills and other processes from the viewpoints of scope and flat integration. The idea is expressed through Bruner's spiral curriculum (Dixon et al., 2000) whose goal include that of reinforcing students' revisits of the subject matter contents allowing logical progression from simple to

complex thus making the learner to transfer early knowledge to later situation. In this context as illustrated in Figure 1 some educational concepts or topics are introduced to learners at a lower level of education when children are young in terms of chronological age and the same topics are re-introduced with increasingly degree of complexity at a later stage of education when the same learner is older (Corpuz, 2014).

For effective learning to take place as depicted in Figure 1, the curriculum structure and its contents from one grade level to another and/or from one program to the other is the key to understanding continuous and continuity in learning. Children learn better when they develop their skills and knowledge from their previous experiences which leads children to becoming stronger at each stage of the education system. According to Hammond et al. (2001), stage theorists such as Jean Piaget (1896 to 1980) and Vygotsky (1896 to 1934) believed that learning is a developmental process, built on from one level of education to the other. Sackett (1981) mentioned that continuity in the behavioral development of learners is crucial as it boosts the learning process In line with this theory, McEwen (2008) explained that prior experiences have some profound impact on children's lifelong learning. This is one way of showing the need to advocate for proper linkage between curricular for kindergartens, primary, secondary and tertiary education. This concept in Agricultural science syllabus at kindergarten is normally advanced in terms of what is taught or learnt by students and how it is delivered by the teacher (Scully et al., 2003).

The current situation as alleged by agriculture teachers in Botswana is that, (i) primary school syllabus tends to be more complex than the junior secondary school curriculum, and the (ii) educators at each level seem to operate in isolation. Secondly, the resource and infrastructure have no linkage as the subject matter contents seem to be more of a challenge for both the learner and the educators in schools. According to Adedeji and Olaniyan (2011), it is important to have good teachers in order to have a good education system for a country to provide its citizens with quality education and therefore, quality life. FAO (2010) expressed that the concept of school curriculum should be linked to social life practices which promote good diet, nutrition education, livelihood skills, as well as empowering people to extend learning beyond the school boarders in different ways. This highlights the importance of transfer of knowledge from the classroom into the real life of practical world. In biological sciences and educational psychology, the concept of continuity is defined in terms of cumulative effects of a phenomenon that is being observed such as behavior, knowledge, skills, attitudes as well as the physical growth acquired (Seefeltd et al, 2010). The general consensus on this theory is that the continuity in education serves as an ingredient for effective acquisition of knowledge imparted by the teacher between kindergarten through primary school and secondary tertiary and higher education. In this regard, learning as explained in psychology is growth or development in learning.

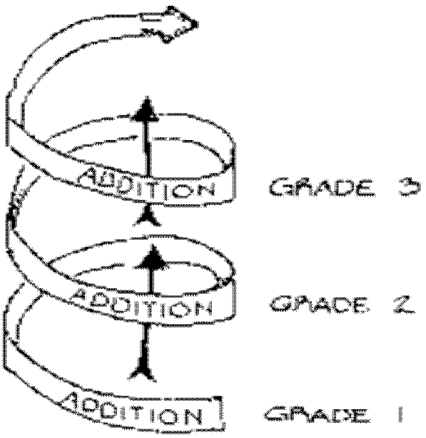

Figure 1. A typical example of how continuity and progress in a spiral curriculum is viewed.

Scully et al. (2003) indicated that the person's growth is continuous and therefore the way people learn or get educated should also be seen to be continuous. In other words, one's experience should be seen to build on another stage of development. Seefeldt and Galper (2006) stated that 'a thread of meaning runs through a number of experiences, forming a coherent, whole, continuous learning curriculum for young children'. Even though experiences can come from every disciplines of life to the other, it is also worth noting the fact that each experience is chosen, because it builds on a previous one and leads to new advanced experiences. Seefeldt et al. (2010) further lamented that in most cases experiences were chosen not only because they are connected to other experiences, but also because they tend to enhance, deepen, and strengthen children's concepts, ideas, and perceptions of content. According to Vygotisky (1978) the challenges 'encountered in the psychological analysis of teaching cannot be correctly resolved or even formulated without addressing the relationship between learning and development in schools (Vygotisky, 1978:29). The theory explains that the development or learning starts from home and spreads out to people they interact with and continue as the child start schooling. Thus, advocating for continuity in the learning process.

Curriculum is one area that has been easily criticized for preparing and producing people who cannot match other graduates as well as generating their own jobs. The questions we forget to answer include, do our curriculum link to each other: say from kindergarten to primary school through to senior schools and tertiary level as well as the world of work? Do teachers' of agriculture teach

things that are linked for mastery purposes to cause applications of experiences? In this study, the idea is to learn about the agriculture curriculum at primary schools through an analysis of how much of the content taught at primary schools is further included and taught at junior secondary schools for mastery purposes? At what level are topics in junior secondary school offered low or higher level in terms of the cognitive domain of learning? How do teachers perceive the linkages that exist between the two programmes? Baliyan and Nenty (2015) reported that the secondary school students in Botswana have negative attitude towards agriculture and a number of factors underlying the negative attitude were identified. Moreover, the students' performance in terminal examinations has been observed to be declining (Sibanda et al., 2015). Is the negative attitude of students towards agriculture and the decline in performance of students in the subject impacted on by the curriculum articulation in Botswana? This type of questions can be answered if a proper analysis of linkages between the agriculture syllabi at different school levels is accomplished.

LITERATURE REVIEW

Studies in curriculum alignment are important in determining how the curriculum is presented in an education system as well as showing how people learn in schools across the age groups. Curriculum generally is the interplay among education standards, assessments, content, and instruction. Curriculum serves to describe activities that lead learners to understand the knowledge and skills they should acquire (Tweed, 2007). There is a relationship between what the teacher teaches in the classroom, which includes instructions, assessment, curriculum and standard of education. According to squires (2004) curriculum is central to all what happens in school because it is aligned with instruction, and assessment. Tweed (2007) stated that an audit can be conducted to establish the consistency of teaching of teachers in one building and those teachers within a region. In the context of education, alignment can be broadly defined as the degree to which the components of an education system such as standards, curricula, assessments, and instruction work together to achieve desired goals (Resnick et al., 2003; Webb, 1997). Case et al. (2004) reported three kinds of alignment in education, sequential development, expert review and documental review.

Generally as found by Watermeyer (2000), articulating and aligning the curriculum is a complex and time-consuming effort which requires the cooperation and collaboration of teachers, educational managers and regulators. Watermeyer further stated that the process is complex because needs of learners become complex as they grow and that creates a challenge for educators to address their needs. For example, Gamoran et al. (1997) as cited by Watermeyer (2000) has shown complexity with the transition mathematics courses which evidenced disparities of content coverage between a college preparatory class, where students learned more, and a general track mathematics class. In a school, the disparity was found to be better where the curriculum was designed and delivered.

Continuity of the curricular also known as the vertical articulation emphasizes on the importance of building curricular upon students' previous learning experience as well as requiring a gradual increase in the curriculum complexity (Tyler, 1949). Curriculum continuity relies on a well-connected curriculum of different stages of learning which promotes consistent learning. According to the Blooms taxonomy, easier concepts should be taught to young children and gradually build up to complex materials as the children grow up to a higher level of learning. This explains why children at a lower level of education should be taught at lower level of the cognitive domain of learning.

Blooms et al. (1956) stressed that cognitive domain is built on varying levels of thinking complexity (knowledge, comprehension, application, analysis, synthesis and evaluation). To accomplish higher order thinking requires analysis and understanding of the new situation, background knowledge of methods which could be readily utilized and some facility in discerning the appropriate relations between previous experience and the new situation. Whittington continues to note that the understanding of way in which curriculum is implemented, and not what the curriculum contains would make the difference in developing the thinking ability of students. According to Fabian and Dunlop (2007), primary schooling has been perceived as one of the crucial transitions in a child's education life. This is a major challenge of early childhood as initial success at school, both socially and intellectually leads to a virtuous cycle of achievement and can be critical factor in determining children's adjustments and future progress.

Takaya (2008) stated that for curriculum reforms in early education the basic concepts of science and humanities can be grasped intuitively at a very early age. He continues to insist that the curricular should be designed to foster such early intuitions and build on them in increasingly formal and abstract ways as education progresses. It is in this context that Hussain et al. (2011) described a good curriculum as the one which promote continuity of experience, provide educational goals and utilize effective learning experiences and needed resources. Morapedi (2002) examined the relationship between the phases of education at primary, secondary and tertiary education in Botswana. and highlighted that although there were some continuity, there are also signs of discontinuity that primary, secondary and tertiary level do not articulate well in certain areas with the tertiary system.

Therefore, the purpose of this study was to analyze the curriculum linkage between primary and junior secondary schools agriculture in terms of goals, subject matter contents so as to establish its relevance in terms of linkage with other levels of education. In addition, the study also determined the views and opinions of teachers of agriculture regarding the linkages that exist between two syllabi of agriculture in schools. The specific objectives of the study were as follows:

i) To compare the syllabi contents for agriculture syllabus at primary and junior secondary schools in terms of goals, objectives, subject matter and activities.
ii) To analyze instructional objectives in selected topics at primary and junior secondary schools in terms of the cognitive domains.
iii) To determine the proportions of cognitive levels of instructional objectives offered at primary schools and junior secondary schools.
iv) To describe the in-service student teachers perceptions on the existing linkages between the primary schools and the junior secondary schools.

MATERIALS AND METHODS

A descriptive research design (Retallick, 2007) was adopted for this study based on content analysis of the syllabi and a survey of in-service student teachers to describe the degree of articulation of agriculture education programmes. The contents of two syllabi were encoded and structured followed by quantifying and systematically making comparisons (Chi, 1997; Prasad, 2008; Astalin, 2013). The study employed content analysis technique which can be both qualitative and quantitative (Hsieh and Shannon, 2005). The authors further described the content analysis technique as a conventional, directed, or summative analysis. In this study, content and summative analysis was conducted whereby the contents of the syllabi were assessed and coded (Creswell, 2002) in terms of topics taught and levels of objectives at each topic. Data gathered through the process were tallied to show topics in the syllabus for primary schools and those in the junior secondary schools. In addition a survey was conducted using a close-ended questionnaire to gather teacher's views about linkages between the two syllabi in the form of narrative statements.

Data collecting tools

Three instruments were designed for collection of data for the study. The first instrument was designed to collect data on the number of objectives per topic by counting. The second instrument was designed to categorize objectives in the agriculture syllabi in relation to the six (6) levels of the cognitive domain of learning; knowledge, comprehension, application, analysis, synthesis and evaluation by the researchers. For each topic in the syllabus, the researchers indicated by a check (✓) (Table 1) the category at with each objective falls. The third instrument was a survey questionnaire used to gather data from the sampled respondents about their views on linkages between the two syllabi. The survey instrument was structured into two parts. In Part one, the respondents were asked to provide their demographic information. In part two of the questionnaires, respondents were asked to respond to the items on perceptions on the curriculum linkages existing between primary school and junior secondary schools.

The content validity of the instrument was done by a panel of three specialists in agricultural education and extension at Botswana College of Agriculture. The comments obtained from the experts were incorporated into the final instrument for data collection. Haynes et al. (1995) reported that content validity was the extent to which the data collecting instrument as a measurement tool was relevant and representative of the construct to measure. Content validation is very important as it results in valid results and therefore valid conclusion (Golafshani, 2003).

Table 1. Syllabus objectives in relation to levels of the Cognitive Domain.

Subject topic	Objectives in the syllabus	Cognitive domain levels					
		K	C	A	An	S	E
Vegetable production	List names of vegetables	✓					
	Classify vegetables		✓				
	Discuss the nutritional value of vegetables					✓	
	Draw a vegetable plot			✓			

Key: K = knowledge; A = application; S = synthesis; C = comprehension; An = analysis; E = evaluation.

Population and sampling

The study targeted the two agriculture syllabi; primary schools and junior secondary schools for content analysis. The primary school agriculture syllabus had 18 subject matter contents while the junior secondary school syllabus had 17 subject matter contents. A total of 50 in-service teachers were purposively selected which included 25 primary school teachers and 25 junior secondary schools teachers who were enrolled for further studies at Botswana College of Agriculture were used in the study.

Data collection

The researchers manually assessed the syllabi contents one by one in relation to the items in the questionnaire to check [√] presence or [X] absence against each topic in the primary and junior secondary schools. The levels of cognitive domains were also checked [√] in relation to objectives in the syllabi to establish the skill outlined in the syllabi. The respondents' perceptions on the linkages were collected through a survey using the validated questionnaire.

Data analysis

To determine the skill and knowledge taught, the Statistics Package for Social Science software (SPSS) version 20 was used. The frequencies and percentage (%) for each skills outlined in the syllabi in relation to the domains of learning levels were computed. The teacher's perceptions data were also computed using frequencies and percentages to establish how in-service students perceived the linkages existing between the two curricular for agriculture.

RESULTS AND DISCUSSION

Demographic characteristics of the sampled respondents

The demographic characteristics of the sampled in-service student teachers are presented in Table 2. Table 2 shows that majority (64%) of the respondents were females, 66% were aged between 31 and 40 years old, 50% had taught in primary school before, 50% had a diploma in primary school education, followed by 30% who had diploma in agricultural education. The results also showed that majority (50%) had their last education at primary colleges of education, followed by 24% who had their last education at Botswana College of Agriculture. The least were 8% who had their last education at the University of Swaziland. Furthermore, 46% of the in-service student teachers had taught for a period of between 6 and 10 years, followed by 28% who had taught by for a period of between 11 and 15 years. 58% of the respondents were single(not married), 36% held the position of Senior teacher grade II, followed by 34% who had served as Senior teacher I in their schools, 42 % majored in agriculture during their training and 52 % were teaching all subjects while 44% were teaching only agriculture.

Comparison of agriculture syllabi contents at primary and junior secondary schools

The study assessed whether or not the subject matter contents in primary and junior secondary school agriculture syllabi had a relationship in terms of similarities/differences and, whether or not the two syllabi were building onto the other. The study also compared the topics contained at each level of education and the number of objectives for each topic. The results indicated that at primary school level, there were18 topics with a total of 127 instructional objectives while the junior secondary school level had 17 topics with 445 objectives. Analysis further indicated that the highest numbers of objectives were on animal production with 18 objectives, followed by vegetable production with 16 and fruit production with 14 objectives (Table 3). These results are consistent with the Botswana Government policies towards diversification of the agricultural sector prioritizing animal production and horticulture sub-sectors. The results also indicated 44 objectives in chicken production, followed by 40 on principles of crop production and 38 on farm management. All these results support skills development and empowerment of the citizens contributing to the economy. The topics with the least number of objectives in the primary school agriculture syllabus was three contents on soil science with 2 objectives under soil formation, soil constituents and soil structure which indicate that the area related to soil science is not adequately incorporated in the syllabus. However, these areas are necessary for improvement of crop production in the country as these contents provide basic and necessary information on the soil related aspects and therefore, the syllabi need to be revised by incorporating more contents on soil science.

Table 3 also indicated that the topics which had the highest number of objectives in Primary school syllabus were not necessarily the same that had the highest number of objectives in the junior secondary education syllabus. This means that, there is minimal continuity of teaching subject matter contents taught at primary school level. It can also be noted that each level of education has its priority in terms of topics to offer to students. Generally, the majority of the topics in primary school syllabus had few objectives as compared to the junior secondary agriculture syllabus. The reason could be that a deliberate move was made to introduce the concepts in primary school level and develop it further at junior secondary school level for mastery purposes. This agrees with Bruner's spiral curriculum model (Martin, 2008).

The results in Table 3 also reflected that different components of soils were part of the syllabus (soil structure, soil texture, soil texture, soil constituents, and soil erosion) at primary school whereas at junior secondary education level, it had only one component 'soil fertility'. While the idea may be acceptable, one would expect the topic 'principles of soils' or 'soil management' to be included in the junior secondary education to build on the knowledge acquired at lower level. The inclusion of principals of soils or soil management could be an included as students at this level were expected to conduct practical/research projects of growing crops where they need some basic skills in terms of soil preparation and fertility. Similarly, the topics on 'animal production' in the primary school syllabus take into consideration the aspects of practical animal skills, that is, rearing of livestock enterprises to create awareness.

Analysis of objectives on common topics in both syllabi

Table 4 presents the six agriculture topics which were offered in primary and junior secondary school syllabi. The study found that six (6) topics have the same names at primary and secondary education constituting 33% of

Table 2. Demographic characteristics of the sampled respondents.

Demographic characteristics		Frequency	%
Gender	Male	16	32
	Female	34	64
Age	21 – 30 years	3	6
	31 – 40 years	33	66
	41- 50 years	14	28
	51 years and above	-	-
Level of teaching	Primary school	25	50
	Junior secondary school	25	50
Level of education	Diploma in Agricultural Education	15	30
	Diploma in Secondary Education	10	20
	Diploma in Primary Education	25	50
Last institution attended	Tonota College of education	9	18
	Botswana College of Agriculture	12	24
	University of Swaziland	4	8
	Colleges of Education	25	50
Number of years in teaching	Five years and less	2	4
	Between 6 years & 10 years	23	46
	Between 11 years &15 years	14	28
	Between 16 years & 20 years	10	20
	21 years and above	1	2
Marital status	Married	17	34
	Single	29	58
	Staying together	1	2
	Divorced	1	2
	Widowed	2	4
Teaching position held	Teacher	16	32
	Senior Teacher Grade II	18	36
	Senior Teacher Grade I	16	32
Teaching training to teach	General teacher for Agriculture	11	22
	Specialised to teach Agriculture	18	36
	Majored in Agriculture with minor	21	42
Subject currently teaching	Agriculture only	22	44
	All subjects	26	52
	Agriculture and Mathematics	1	2
	Agriculture and other	1	2

18 topics and 1.3% of 17 topics, respectively. Further analysis established that the proportions of instructional objectives for the six common topics in relation to overall instructional objectives in the syllabi were 53.5% for primary and 28.8% for secondary syllabi, respectively. Ranking the six (6) courses on the basis of the number of instructional objectives, the results indicated that there were16 objectives for vegetable production, followed by fruit production with 14 objectives and field crops with 12 objectives. Among the six junior secondary school

Table 3. Analysis of agriculture syllabi contents of primary and junior secondary levels.

Primary school agriculture syllabus topics	No. of objectives	Junior secondary school agriculture syllabus topics	No. of objectives
Introduction to agriculture	9	Introduction to agriculture	17
Farm tools	4	Tools, implements and machines	10
Farm implements	6	Soil fertility	24
Biotechnology	3	Principles of crop production	40
Soil formation	2	Field crops	25
Soil constituents	2	Animal nutrition	12
Soil fertility	7	Beekeeping / Fish farming	22
Plant growth	3	Pig /Rabbit production	26
Vegetable production	16	Fruit tree production	23
Farm chemicals	3	Forestry	21
Soil profile	3	Chicken production	44
Soil texture	5	Farm management	38
Field crops	12	Vegetable production	29
Fruit production	14	Reproduction and breeding in cattle	32
Introduction to animal production	8	Beef production	35
Soil structure	2	Dairy production	24
Soil erosion	10		
Animal production	18		
Total	127		445

Table 4. Topics and number of objectives found in both primary and junior secondary school agriculture syllabi.

Topics	Number of objectives in primary school syllabus	Number of objectives in Junior secondary syllabus
Introduction to Agriculture	9	17
Tools and implements	10	10
Soil fertility	7	24
Field crops	12	25
Fruit production	14	23
Vegetable production	16	29
Total objectives	68	128

agriculture school syllabus topics, the highest number of objectives was found in vegetable production with 29 instructional objectives, followed by field crops with 25 and soil fertility with 24 instructional objectives. If the number of objectives for each topic serves as a strategy on priority then, it can be concluded that what is observed to be important in primary agriculture syllabus has not been included in the secondary agriculture syllabus. However, in order to build on the cognitive levels of learners, these contents deemed important in primary school syllabus could have been treated in the same manner in the junior secondary syllabus. The 28.8% proportion of instructional objectives for six (6) common topics in relation to eleven (11) topics with a proportion of 71.2% for secondary school is an indication that there is minimal continuity in what students learn from one level to the other. It also reflected that the linkage between the two syllabi is not strong and therefore, there is need to review the syllabi for proper alignment to enhance effective learning by the students.

Analysis of the cognitive skill levels in popular topics by level of education

Table 5 indicated the analysis of skills included in the primary school and junior secondary school syllabi topics in relation to cognitive domains of learning levels. The primary school agriculture syllabus had the highest number of comprehension skill (42.3%), followed by knowledge skill with 20.3%. The least skill in the primary school syllabus was found to be analysis with 5.1%. The results imply that students were not exposed to evaluation skills in the syllabus. The junior secondary

Table 5. Proportions of cognitive skills in common agriculture topics at primary and secondary levels.

Topic	Primary school syllabus							Secondary school syllabus						
	K	C	A	An	S	E	Total	K	C	A	An	S	E	Total
Introduction to agriculture	2	6	0	0	1	0	9	1	5	0	0	0	0	6
Farm tools and implements	2	2	3	0	1	0	8	2	2	2	0	1	0	7
Soil fertility	2	3	1	1	0	0	7	7	5	2	2	0	2	18
Field crops	1	5	1	1	1	0	9	4	1	4	0	0	1	10
Fruit Production	3	5	2	1	1	0	12	4	3	2	0	0	0	9
Vegetable production	2	4	6	0	2	0	14	12	13	5	0	0	0	30
Total Freq	12	25	13	3	6	0	59	30	29	15	2	1	3	79
Percentage	20.3	42.5	22	5	10.2	0	100	39.7	38.5	17.9	2.5	1.3	3.9	100

Key: K = knowledge; A = application; S = synthesis; C = comprehension; An = analysis; E = evaluation.

Table 6. Analysis of the skills in topics only taught in primary agriculture syllabus.

Topic	K	C	A	An	S	E	Total
Biotechnology	1	1	1	0	0	0	3
Soil formation	1	1	0	0	0	0	2
Soil constituents	0	1	0	1	0	0	2
Plant growth	0	1	2	0	0	0	3
Farm chemicals	1	0	2	0	0	0	3
Soil profile	1	1	0	1	0	0	3
Soil texture	3	1	1	0	0	0	5
Soil structure	1	0	1	0	0	0	2
Soil erosion	3	3	1	0	1	0	8
Introduction to animal production	6	2	0	0	0	0	8
Animal production	2	0	5	1	3	2	13
Frequency	19	10	14	2	5	2	52
Percentage	36.5	19.2	26.9	3.9	9.6	3.9	100

K = Knowledge, A = Application, S = Synthesis, C = Comprehension, An = Analysis, E = Evaluation.

school syllabus was also analyzed and the results indicated the knowledge level comprised of 39.7%, followed by comprehension with 38.5%. The least skill taught at junior secondary school was determined as synthesis with 1.3%.

Analysis of the skills in topics taught only in primary school syllabus

Table 6 presented the analysis of the agriculture topics as sole topics learnt rather than infused in other topics in primary schools only and not continued in the junior secondary school syllabus. These constitutes 11 topics (61.1%) taught at primary school level were found not continued with in the junior secondary school. The highest

Table 7. Student teacher's perceptions on curriculum linkages between both the syllabi.

Statements on perception	Responses	
	Yes (%)	No (%)
Awareness of subject matter content taught at the two levels	60	40
Content linked between primary and Junior secondary levels	38	62
Content linked between primary and Junior secondary levels	68	32
Subject matter at primary level further developed at junior levels	30	70
Topics taught in my level complicated	34	66
Recommend all contents in primary syllabus be included in Junior schools	86	14

skill taught in those topics was found to be knowledge with 36.5 %, followed by application with 26.9% and comprehension with 19.2%. It can be concluded that the syllabus offers low level skills with minimal evaluation and synthesis skills.

Respondent's perceptions on curriculum linkages between the primary and junior secondary agriculture syllabi

A survey was conducted to establish teachers' perceptions regarding the linkages that exist between the primary and secondary school agriculture syllabi. The sampled in-service teachers were asked to respond to six areas regarding their awareness of syllabi contents, objectives, processes of development and their knowledge ability (Table 7). Majority of the respondents (60%) agreed that they are aware of subject matter contents of the agriculture syllabus taught between primary and junior secondary schools. Concerning agriculture content linkage between primary school and junior secondary school, 62% respondents indicated that the two syllabi were not linked to one another. Majority (68%) indicated that primary school agriculture syllabus was teaching children to develop the lower level of the cognitive skills. Majority, 70% of the respondents indicated that subject matter content taught at primary school was not further developed at junior secondary schools. This means that there was minimal continuity of what is taught at primary school in secondary school. At least 60% agreed that they did not find the topics they teach complicated. This means majority of the respondent agreed that there were handling the agriculture topics with ease. Majority of the respondents (86%) indicated that they recommend that all content taught at primary school level be included at junior secondary schools as a way to show progression and continuity of learning (Martin, 2008).

CONCLUSION

Agriculture curriculum linkage between primary schools and junior secondary schools is inadequate in relation to subject matter content taught at the two levels of education system in Botswana. The topic like biotechnology taught in primary schools is not taught at junior secondary schools. What is not known is to whether or not the same topic is taught at senior secondary school. Perhaps there is need to study the Botswana General Certificate of secondary school [BGCSE] syllabus in relation to the two. There was more topic in primary school syllabus than were in junior secondary school syllabus. However, the learning objectives were found to be more in the syllabus for junior secondary schools which could mean that probably the subject matter is taught in more depth at higher level than in primary schools.

Although the study found that there were more instructional objectives in the junior secondary school agriculture syllabus mostly were found to be at a lower level of the cognitive domains of learning. This means that the teaching in secondary schools places emphasis on knowledge and comprehension just like at primary school level indicating that the subject is taught at a lower level at both primary and secondary. The results also indicated that majority of the instructional objectives were knowledge, and comprehension. This means that agriculture in primary schools and junior secondary schools was taught at lower level requiring students to recall with less skills of synthesizing and evaluating concepts.

RECOMMENDATIONS

Based on the findings of the study and to ensure and promote agriculture curriculum linkage and continuity between primary schools and junior secondary schools, the following recommendations were made:

1. There is need to ensure that the agriculture subject matter content taught at primary schools be further developed at junior secondary school level to promote the concept of continuity and progression between the two curricular in order to enhance mastery of skills and knowledge.
2. Majority of the instructional objectives were at lower level which means the teaching of agriculture at lower

level requires instructor to expect students to remember concepts rather that synthesising agriculture science concepts and evaluating for application in the field of agriculture. The curriculum for agriculture should place emphasis on application and understanding than remembering where student easily forget. There is need to review the curriculum and improve on the domains of learning to enhance the interest in agriculture and thus, develop the positive attitude towards agriculture.

3. Teachers of Agriculture at primary school should be rained to specialise in Agriculture, since the subject is science based and more demanding and also be trained at same level with junior secondary school teachers to ensure smooth transition of learners between the two levels.

4. A similar study may be conducted to determine level of linkage between primary, junior and senior secondary school. Currently the two programmes are operating in discrete not showing that what students have learnt at primary school would be able to learn to master the subject matter at higher level.

5. Lastly, it is recommended to conduct studies to analyse the learning at all stages of learning process because the analysis of stages of learning is important since they also promote the level of development of learners.

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