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A Bernsteinian Analysis of the Recontextualisation of Knowledge in the 5090 Biology Syllabus in Zambia

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ABSTRACT

This study was focused on exploring the recontextualisation of knowledge in the 5090 biology syllabus in Zambia. The study will help to understanding the rules that is the instructional and the regulative discourse in the syllabus as this will enable the biology teachers to effectively teach biology in secondary schools. Learners have not performed well in the 5090 biology syllabus. The performance poor performance in the 5090 biology has been attributed to a number of reasons. One of the many reasons is that teachers do not know what they are to teach and how they are to teach. An analysis of the syllabus will inform the biology teachers with the content in the syllabus and how the content is to be transmitted. Bernstein's classification and framing concepts have been used as analytical tools. Indicators were developed to guide the analysis. The document was inductively coded using Atlas ti 8 software. The findings indicated a strong framing (F+) in the selection, sequencing, evaluation criteria and in the hierarchical rules. Pacing was not indicated in the document. The classification was weak in the inter disciplinary, intra disciplinary and in the inter discursive relations.

Keywords: Recontextualisation; 5090 biology syllabus; Classification; Framing; Recognition; Realisation

INTRODUCTION

This study explored the recontextualisation of knowledge in the 5090 biology syllabus. The 5090 biology syllabus is taught to all the learners in their senior grades that are from grade 10 to grade 12 in secondary schools in Zambia. The syllabus was prepared by the government through its officals. The Curriculum Development Centre (CDC) spear headed the development of the syllabus. The development of the syllabus or curriculum involves recontextualisation processes which take place in the recontextualisation field of the pedagogic device. The pedagogic device has three fields, which are the production, recontextualisation and the reproduction fields. Specifically the syllabus is development in the Official Recontextualisation Field (ORF) of the Pedagogic device [1].

The Official Recontextualisation Field (ORF) is the field which is dominated by government agencies and its officers. This field includes the government departments at national level, provincial level and at district level. The field also includes the researchers and the subject inspectors or the standard officers at the different levels of the nation who are the advisors. The ORF also include the people who are not specialists in the pedagogic discourse, such as the stake holders from industries. Stake holders have interest in the education and that they could influence the state and the pedagogic practices. For this study, agents in this field could include the standard officers at national level, provincial level from the ministry of education, curriculum development center, researchers from the research centers, stake holders, that is agents from the industries [2].

When the 5090 biology syllabus has been prepared in the official recontextualisation field, it is taught to all the learners in secondary schools in Zambia. If all learners are to successfully learn biology in secondary schools, teachers need to have an understanding of the knowledge to be transmitted in the 5090 biology syllabus, that is the 'what' and the 'how' knowledge was to be transmitted. Currently biology is one of the sciences in which the learners have not done well in the final examinations as reported by the examination council of Zambia. The examination council of Zambia is an institution responsible for all the examinations in Zambian schools, from primary to secondary schools and even in colleges of education. The poor result obtained in the 5090 biology is a concern for this study. Scholars have attributed the poor performance in the sciences to teachers not being aware of the 'what' and the 'how' of the pedagogic discourse they are teaching. Where the teachers have had access to the curriculum, they have not understood the 'what' and the 'how' of the pedagogic device. In some cases, teachers have had access to the curriculum, but they have not ready the curriculum they are teaching. Worse still some teachers have not seen the curriculum they are teaching [3].

Hence a need that this study is carried out in Zambia with a view to help the teachers understand the instructional and the regulative discourse embed in biology syllabus.

This study will explore the recontextualisation of knowledge in the 5090 biology syllabus with a view of helping the teachers to be informed of the knowledge they are to teach the learners, and the biology content was to be taught. The study will also inform the educators the gaps in the syllabus to successfully teach all the learners [4].

The research question which guided the study is: How is knowledge recontextualised in the 5090 biology syllabus?

Pedagogic discourse

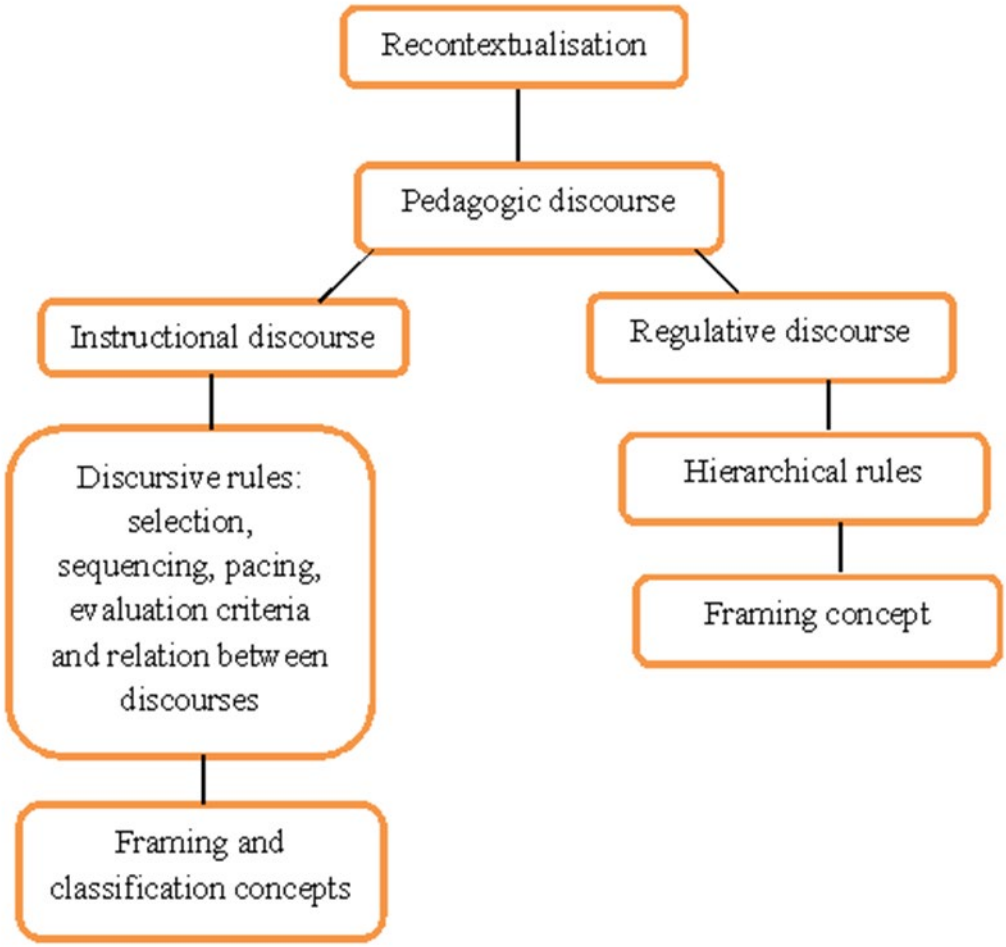
The pedagogic discourse is a recontxteualising principle which embeds two discourses which are the Regulative Discourse (RD) and instructional discourse. The regulative discourse is a discourse of social order while, the instructional discourse is a discourse of knowledge and skills. Bernstein calls the instructional discourse as the discursive rules and he calls the regulative discourse as the hierarchical rules. The regulative discourse always dominates over the instructional discourse. The instructional discourse is concerned with the selection, sequencing, pacing of knowledge, evaluation criteria and the relations between discourses. It is concerned with the knowledge, skills and values to be transmitted. It is the one which say this is what should be taught, or this is what our learners should learn. The regulative discourses are concerned with the moral issues in the communication. These rules create social order in a pedagogic communication. The rules of the pedagogic discourse are characterised using the classification and the framing concepts. The discursive rules and the hierarchical rules inform the rules of the pedagogic device [5].

Bernstein argue that what is relayed is the discourse or, as he sometimes calls it, the "text" though it is still not clear when it comes to the relay itself, that is, the structures that allow it to be conveyed. In other words, pedagogic discourse emphasises verbal behavior that is what is written and said at the expense of a regulatory pattern of language that is the structures that allow the speech. This was a concern to Bernstein who indicated that, when we study pedagogic communication we study only the surface features, only its message, and not the structure that makes the message possible. Bernstein was concerned with the production of knowledge and the transmission of the produced knowledge [6].

According to Bernstein, pedagogic studies were focused on the content of the message that was relayed, the 'what' in the pedagogic transmission and not on the structure of the relay system which makes the transmission and acquisition of the content possible. It is Bernstein's view that the focus should be on the structure of the relay system, the 'how' and not on the 'what'. According to Bernstein, pedagogic discourse is a relay of the pedagogic communication. The relay of pedagogic communication embeds two discourses which are the instructional discourse and instructional discourse as earlier indicated. An understanding of the instructional discourse and regulative

discourse enables one to understand the structure of the relay which enables the message to be transmitted. This also informs us that the rules of the pedagogic device are in the instructional discourse and regulative discourse.
Bernstein later used the concept of code (classification and framing) to describe and characterise the pedagogic discourse. A number of researchers have used the concepts of classification and framing to characterise the pedagogic discourse [7].
Following Bernstein's description of a pedagogic discourse, in this study, I will use the code (classification and framing) to describe the pedagogic discourse/instructional discourse and regulative discourse. The instructional discourse will be described in terms of the strength of the framing in the selection, sequencing, pacing, evaluation criteria and in terms of the strength of the classification in the relationships between the discourses. The RD will be described in terms of the strength of the framing in the control relationship between the teacher and the students. The classification and framing rules, indicate the strength of the recognition and realisation rules. The strength of the recognition and realization rules determine how one will acquire the text being transmitted.
Bernstein indicates that, the recognition and realisation rules are strong when the framing is strong in the selection, sequencing and in the evaluation criteria with a weak framing in the pacing and in the hierarchical rules. While the classification between the discourses need to be weak.
Classification and framing concepts are important in that changes in the classification and framing strength entail a change in the pedagogic discourse. Also the classification and framing strength indicate the strength of the recognition and realisation rules in the acquiring of the text. It is the strength in the classification and framing in the pedagogic discourse that is in the 5090 biology syllabus which is the focus in this study. A number of scholars have used the concepts of classification and framing to characterise the pedagogic discourse. Figure 1 show the relations between concepts [8].

Figure 1. Relations in the concepts.



Classification and framing

Bernstein used the concepts of classification and framing to describe and characterize the pedagogic discourse. Classification is about the organisation of knowledge. Classification shows the relation in the knowledge. Strong classification is indicated when there is no relation in the knowledge and weak classification is indicated when there is a relation in the knowledge. Classification helps to inform how much each curriculum subject is distinct or unique in

the curriculum. Classification also shows how much the subjects are related to each other in the curriculum. It is the relationship between the subjects in the curriculum which is a concern for educators. Subjects are to be related when the classification is weak. On the other hand classification is strong when the subjects are not related.

Classification is concerned with the power relations and the strength of the boundaries between categories such as discourses, agents and practices. The relation in the topics in a course also show the classification of knowledge in a course. Bernstein used the concept of classification to examine the strength of the boundaries between the different categories/subjects. For example the relationship

- Between teacher-student and student–student.
- Between discourses-intradisciplinary relation, interdisciplinary relation and relation between academic and non-academic knowledge.
- Between spaces-teacher's space–students spaces of different students.

Such relationship can be characterised by the form of the boundary. When the boundaries between the categories is blurred between students of different social groups (social class, gender, race, school achievement) then the classification is said to be weak. This means that the students share physical and material space. Strong classification will entail that boundaries between will be very sharp between space and material and that hierarchies between students will exist. However, the teacher–student relationship is always strong. However, at the intra-disciplinary level, there is a weak classification between the several contents of a given discipline and the content in the discipline are interrelated. At the interdisciplinary level, a strong classification exist since the contents of the curriculum are separated from each other, there is no relation in the contents of the discipline in the curriculum. A curriculum is said to be strongly classified if the subjects in the curriculum are highly differentiated and separated into traditional subjects, while a curriculum is said to be weakly classified if the subjects are integrated and the boundaries between the subjects are weak/fragile/blurred. Bernstein also used the concept of framing to describe the control relations in the Pedagogic discourse [9].

Framing is concerned with the control relations in a Pedagogic discourse. Framing regulate the knowledge to be created and what knowledge is available in the different categories. Framing enables the conversion of knowledge into the pedagogic communication [10].

Framing is said to be very strong (F++) when the sentence or statement clearly indicates the content to be transmitted and the order in which the content will be transmitted and the time of acquisition is clearly indicated in the document [11].

MATERIALS AND METHODS

Document analysis was used to collect the data. The document was chosen on the basis that it contained the relevant information to the research question. The 5090 biology syllabus was analysed in this study. The goal for analysing the 5090 biology syllabus was to understand how knowledge has been recontextualised in the 5090 biology syllabus. It was important to analyse the curriculum to be informed of what the teachers were expected to know and to do in their teaching practices if they are to successfully teach biology in secondary schools. An inductive approach was used to code the document using Atlas ti 8 software [12].

The instructional discourse and the regulative discourse formed the basis of the analysis. Bernstein's classification and framing concepts have been used as the analytical tools. To be able to read the data, scaling grid was developed to be used to analyse the relations in the 5090 biology pedagogic discourse. A sentence or a complete statement was a unit of the analysis [13].

The instrument developed to guide the analysis is attached as Appendix 1.

RESULTS

The codes and categories which emerged from the analysis of the 5090 biology syllabus have been presented in Table 1.

Table 1. Codes and categories from the 5090 biology syllabus.

Codes	Categories
Grade 10 topic 1	5090 Biology syllabus content
Grade 10 topic 2	
Grade 10 units	
Grade 11 topic, subtopics, specific outcomes, content	
Grade 11 units	
Grade 12 topic, subtopics, specific outcomes, content	

Grade 12 units	
Knowledge	
Skills	
Continuous assessment in schools	Evaluation criteria
Grade 10 outcomes	
Grade 11 outcomes	
Grade 12 outcomes	
Outcome based principles	
Time allocation	Pacing of knowledge
Attitudes	Regulative discourse
Interest and appreciation	
Values	
Attainment of the 2030 vision	Relations between discourses
Everyday life	
Individual and national development	
Long life education	
Skills for long life education	
Stimulate interest	
Agents involved	Selection of knowledge
Consultative process	
Appendix 1-scope and sequence	Sequencing

As shown in Table 1, the categories which emerged are: selection of knowledge, sequencing of knowledge, pacing of knowledge, evaluation criteria, relations between categories, pacing and the regulative discourse. The codes included in each category are shown in Table 1. The categories were analysed. The findings on the analysis of each category have been presented below [14].

Selection of knowledge

The content to be taught is explicitly indicated in the document. The topics, sub-topics, specific-outcomes and the content (knowledge, skills and value) are explicitly shown in the syllabus for the grade 10, 11 and 12 (Table 2).

Table 2. Topics, sub-topics, specific outcomes and content.

Topic	Sub-topic	Specific outcomes	Content		
			Knowledge	Skills	Values
Living organisms and life processes	Character-stics of living organisms	• Identify the characteristics of living organisms. • Distinguish between living organisms and non-living things. • Describe life processes of	• The characteristics of living organisms: Feeding, breathing, reproducing, growing, locomotion, sensitivity and excretion. • Living organisms and non-living things. • Life processes of living organisms: Metabolism (Catabolism and anabolism). Include the role of enzymes.	• Communicating: Information on the characteristics of living organisms • Comparing: Living and non-Living organisms • Communicating: Metabolism and the role of enzymes	• Appreciatitig : Characteristics of living organisms • Asking : Questi ons for more understanding • Appreciating: Life proces ses and role of enzymes

		living organisms.			

The syllabus has also indicated the general outcomes and the competences learners are expected to acquire as shown in Table 3.

Table 3. Specific outcomes and the content.

General outcomes	Key competences
• Demonstrate understanding of asexual reproduction. • Demonstrate understanding of vegetative reproduction. • Develop investigative skills. • Demonstrate understanding of sexual reproduction in flowering plants. • Demonstrate understanding of sexual reproduction in animals. • Demonstrate understanding of genetics. • Demonstrate knowledge, attitudes and values about plants and animals. • Acquire knowledge and value of soil. • Develop knowledge, positive attitudes and values about ecology. • Demonstrate knowledge, attitudes and values about population.	• Demonstrate the ability to identify the reproductive parts in flowering plants. • Show the ability to demonstrate variation of characteristics in plants and animals. • Demonstrate the ability to identify and classify different species of animals and plants. • Demonstrate the ability to investigate the composition of soil. • Demonstrate the ability to design a food chain in a given ecosystem.

The general out-come and the competencies have been specified for all the three grades, that is grades 10, 11 and 12. Therefore in terms of knowledge selection, the biology syllabus is strongly framed (F+). This means that the transmitter have the control in what is taught in schools. Selection of what is to be taught in schools is done by the transmitter (teacher). Strong framing in knowledge selection promotes teacher centered methodology [15].

Sequencing of knowledge category

The 5090 biology syllabus explicitly indicate the order in which all the topics from grade 10 to grade 12 are to be taught. Appendix Table 1 shows the sequence in which the topics are to be taught.

Therefore, the biology syllabus is very strongly framed (F++) in terms of sequencing. This means that the sequence in which the topics are to be taught is determined by the developers of the syllabus [16].

Pacing of knowledge

Pacing is concerned with the time to be taken to teach a topic. There is no indication of how long one should take to teach a topic in the syllabus. However the syllabus has indicated the time to teach and learn biology in a week, five 40 minutes time per week indicating that,

“Time allocation for this syllabus is will require at least five 40 minutes periods per week”.

In terms of pacing, framing is strong (F+). The teacher has the control in the pacing of the teaching and learning. The transmitter decide how long should be taken to teach a topic and how many periods per week. The teacher will decide how much work to be done in a given time [17].

Evaluation criteria

Evaluation is key in Bernstein’s work. Evaluations condense the entire purpose of the pedagogic discourse. The analysis has revealed that outcomes, assessment and the syllabus aims are explicit in the document. The syllabus has shown that the syllabus puts more emphasis on the performance of the learners in the tests and examinations to be done. The syllabus indicate the way the learners are to be assessed. There is a focus on the performance of the learners is seen through the testing which has to be done throughout the teaching and learning and through the final examination done at the end of grade 12.

The emphasis in the performance is also seen by the control measures set by the examination council of Zambia. The council clearly indicate the focus of the assessment by providing the assessment guide lines to schools. The syllabus indicate that,

"Continuous assessment will be emphasised by using various methods of testing according to topics and themes at various levels. The examinations council of Zambia will prepare detailed procedures on how continuous assessment will be conducted by the teachers [18].

The examination council will also develop the scheme of assessment examination syllabus to provide teachers with guidelines on the objectives to be tested. The scheme of assessment will consists of school based assessment and final examination that will be conducted by the examinations of council of Zambia".

In terms of evaluation criteria, the framing is very strong (F++). The syllabus puts more emphasis on the performance of the learner which is done through testing and through what is called final examination. According to Bernstein, this emphasis on tests and examination indicate a performance type of curriculum.

The syllabus indicates that it was revealed in line with the outcome based principles, hence its emphasis on learner performance indicate that, it has the characteristics of a performance curriculum which has the focus on the performance of the learners. Performance curriculum promotes teacher centered methods. This contradicts the learner centered methods indicated in the biology syllabus [19].

Relations between categories

Analysis of the discourses in the syllabus has shown that the syllabus is weakly classified (C-) in terms of inter discipline, inter discursive and intra disciplinary relations. A weak classification in the intra disciplinary is seen in the relations between the topics. This is evident in Table 1 on sequencing of the topics in which the topics have been arranged in relation to each other that is, topics build on each other.

In terms of inter discursive relations, the biology syllabus is weakly classified (C-). This is observed in the vision of the syllabus which state that the syllabus aims to, "develop abilities and skills that: Are relevant to the study and practice of biological sciences, are useful in everyday life, encourage efficient and safe practice, encourage effective communication."

The syllabus aims to provide, "quality, life long education for all which is accessible, inclusive and relevant to individual, national and global needs and value systems."

Further,

"The syllabus has been reviewed in line with the outcome based education principles which seek to link education to real life experiences that give learners skills to access, criticize analyse and practically apply knowledge that help them gain life skills. Its competences and general outcomes are the expected outcomes to be attained by the leaners through the acquisition of knowledge, skills, techniques and values which are very important for the total development of the individual and the nation as a whole. Effective implementation of outcome based education requires that the following principles be observed: clarity of focus, Reflective designing, setting high expectations for all learners and appropriate opportunities."

The quotations have shown how the discourses of biology are related to everyday knowledge in real life activities. The insulation between the biology discourse and everyday discourse is weak. Meaning there is a relationship between everyday knowledge and the biology knowledge. The knowledge learnt in biology has to be applied in everyday life for the benefit of the individual and the society.

The inter disciplinary relations are observed in the data extracts that follow.

"Promote an awareness that: The study and practice of Biological Science is subject to social, economic, technological, ethical and cultural influences and limitations,"

The weak inter disciplinary relations are seen in the topics of the syllabus which has shown that the topics in the 5090 biology syllabus are extracted from the different disciplines. For example the topics are from the plant biology discipline, microbiology discipline, animal biology. Therefore there is a strong inter-disciplinary relation in the topics.

Regulative discourse

The regulative discourse emerged as one of the categories in the analysis of the syllabus. The analysis found that the syllabus is also concerned with the development of the expected behaviour and attitudes in the learners. For example the learners are to, "develop attitudes relevant to Biological Sciences such as: Concern for accuracy and precision, objectivity, integrity, safety." The syllabus has also shown the "development of: The skills of enquiry, the attitude of: initiative, inventiveness" the development of the attitudes and behaviour is also seen in the outcomes. For instance, "Assessment outcomes describe the knowledge, skills, values and abilities that learners are expected to demonstrate at the end of the course". Therefore in terms of framing, the regulative discourse is strongly framed (F+)

Instructional discourse theme

Analysis of the categories resulted into the Instructional discourse as the main theme. The categories included in this theme are: selection of knowledge, sequencing of knowledge, pacing of knowledge, evaluation criteria and the relations between the discourses. The instructional discourse is concerned with the control relations between the transmitter (lecturer) and the learners and the relations between the discourses being transmitted which characterise

the pedagogic discourse being transmitted.

In summary, the analysis of the 5090 biology syllabus has shown that in terms of framing the syllabus is strongly framed (F+) in the hierarchical rules, selection, sequencing, pacing, evaluation criteria and in the regulative discourse. The analysis has also shown a weak classification in the inter disciplinary, intra-discursive and in the inter-discursive relations. A number of knowledge sources such as the text books, websites, were used to develop the syllabus [20].

DISCUSSION

Analysis of the 5090 biology syllabus reviewed that, the 5090 Biology syllabus was strongly framed in the hierarchical rules, selection, sequencing, and in the evaluation criteria. The time to be taken to teach a topic, that is pacing was not indicated in the syllabus, hence the framing was indicated has (F0). The classification was weakly framed in the inter disciplinary, intra disciplinary and in the inter discursive relations.

The content to be delivered in the 5090 biology syllabus was explicitly indicated in the syllabus. The sequence in which the topics were to be taught was explicitly indicated. The periods in which the syllabus was to be taught per week were explicit in the document. The syllabus did not indicate how much time to be taken to teach a topic. This could mean that, the pacing was left to the teachers to decide on the time to be taken to teach a topic. These characteristics makes the 5090 biology syllabus to be a strongly framed (F+) document in terms of hierarchical rules, selection, sequencing, and evaluation criteria. These findings are similar to the findings in the analysis of the Life sciences curriculum. Though the pacing of the knowledge was not explicitly indicated in the analysis of the document, it is most likely that pacing of the knowledge was strongly framed (F+) as the selection of the knowledge was done by the government and the agents. The strong framing in the hierarchical rules, selection of knowledge, sequencing, pacing and evaluation indicate that the government controls what is taught in schools. This observation was evident in the development process of the syllabus. In Zambia, the 5090 biology syllabus was developed by the ministry of education under the Curriculum Development Centre (CDC) as discussed earlier. The government regulate the content to be taught in the 5090 biology syllabus and that more emphasis is put on the content in the teaching of 5090 biology syllabus. In addition to establishing the CDC department, the government has established the office of the standard officers at all levels of the education, that is the national level, provincial level and at district level. The standard officers are to insure that schools are transmitting the content indicated in the syllabus. Teachers have little autonomy in the pedagogic practices as they are expected to transmit the knowledge, skills and values indicated in the curriculum.

In the 5090 biology syllabus, assessment weighing is clearly indicated. An indication of how the marks are distributed is one of the ways of explicating the evaluation criteria. Explicating the evaluation criteria is one of the ways which enable the learners to recognise the text and be able to realize the required legitimate text. Explicating the evaluation criteria enables the learner to acquire the recognition and the realisation rules which will enable them to produce the legitimate text. If learners are to realise a legitimate text, there is also a need that the framing in terms of pacing is weak (F-). A weak pacing gives an opportunity to explicate the evaluation criteria. A weak pacing entails more learning time given to the learners. A weak pacing has got implications on the cost of the education as this will require more resources. A strong framing in the evaluation criteria observed in the 5090 biology syllabus, is a necessary condition for the learners to be able to acquire the recognition and realisation rules required in the production of a legitimate text. However, a strong pacing indicated in the analysis of the 5090 biology syllabus, indicate a differential distribution of the knowledge in the teaching and learning. A strong pacing indicated, advantages the learners from the middle class family who already possess the recognition and the realisation rules needed for the production of a legitimate text. This leads to a differential distribution of the criteria.

Bernstein emphasised a need for a weak pacing and explicit evaluation criteria as necessary conditions for all the learners to acquire the recognition and realisation rules needed for them to produce a legitimate text. Despite this emphasis on weak pacing, politicians have not accepted to increase the learning time because of the high cost which comes with an increase in the learning time. This situation is worse in a developing country like Zambia were the government struggle to finance the education. This could be a reason why the framing is strong in the pacing.

When pacing is strong, that is the time required for the learners to learn the content indicated in a curriculum or course, only the learners who already have the recognition and realisation rules, that is the learners from the middle class families have been able to produce a legitimate text. This leads to the unequal distribution of the school knowledge. In this case there is a differential distribution of the school knowledge. This is not supposed to be the case as the purpose of schools is to enable all the learners to access a vertical discourse or powerful knowledge which could not be accessed at home [21].

Bernstein also indicate that in cases were the pacing is strongly framed, educators should try to weaken the classification in the inter disciplinary, intra disciplinary and in the inter discursive. That is, there should be a weak classification between space (teacher-students, students–students), topics, disciplines and between discourses. A weak classification between categories enables more time given to the learning that is a weak framing of pacing and a strong framing of the evaluation criteria.

The classification analysis of the Biology syllabus revealed a weak classification in terms of inter disciplinary, intra

disciplinary and inter-discourse relationship. A weak classification in terms of inter disciplinary relationship and intra-discursive indicate that the contents are taught repeatedly in the different disciplines and in the different topics. This leads to more time given to learning the concepts. This leads to learning the concepts at high abstract levels and meaningful learning.
A weak classification between school knowledge and everyday knowledge indicate that everyday knowledge is present in the schools and yet the school is expected to have elaborated knowledge as opposed to the restricted knowledge. Therefore there is a need to explicitly indicate this knowledge especially to learners from a working class families who were socialised in the strong classification between school and home. However a weak classification between the school knowledge and everyday knowledge also leads to meaningful learning. Morais point out that, "a close relation of communication between academic and non-academic discourses has the potential to make knowledge more meaningful, more understandable and applicable."

The weak framing of the pacing is important if the teaching and learning are to be successful. Pacing can be weakened not only by increasing the teaching and learning time. But it can be weakened by weakening the classification between the categories. This is a matter which is agent in the teacher training. Teachers should be competent enough to enable them be aware of the desired characteristics in the pedagogic practice being practiced. They need to be knowledgeable of the characteristics in a pedagogic discourse. The findings in the analysis of the 5090 biology syllabus, contradict the findings in the analysis of the tourism curriculum in which the knowledge was loosely packed with no sequential progression. This knowledge was seen to be similar to that of everyday knowledge that is the horizontal discourse. The knowledge was more practical, personal and context dependent. Learning required involvement of the learners' interaction.
In terms of classification analysis, the classification was found to be weak (C-) in the inter disciplinary relation, intra disciplinary relation and in the inter discursive relations. A weak classification indicated that, there is a relationship between the topics in the syllabus, the discipline of biology with other disciplines and between the knowledge of 5090 biology syllabus and the everyday knowledge. The weakening of the boundaries between the discourses, indicate that the knowledge taught is powerful, or vertical and can be relevant in different context.

CONCLUSION

In conclusion, Morais has indicated that a strong framing in the selection of the knowledge, sequencing of the knowledge and evaluation of the knowledge with a weak pacing of the knowledge and weak framing in the hierarchical rules are necessary for successful teaching and learning. However, weak pacing implies that more time is needed in the teaching and learning. An increase in the teaching and learning entail an increase in the cost of education which has not been easy and has not been accepted by governments. Therefore an alternative is to weaken the classification. In all these pedagogic practices, what matters is the way the teachers are trained. Teachers need to be trained in a way that will equip them with the required competencies to be aware of the necessary pedagogic practices which could enable them provide quality education and relevant education to all the learners. Teachers need to be aware of the characteristics of the pedagogic discourse they are implementing. In all this what matters is the way teachers are trained. Teacher training is crucial in the successful implementation of the curriculum.

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