CHAPTER 6
SUMMARY OF THE FINDINGS, AND RECOMMENDATIONS

This chapter briefly describes three issues. Firstly, it presents the limitations of the study (factors which could decrease rigour); secondly, a summary of the findings presented in the previous chapters; and thirdly recommendations made to various stakeholders who could improve the situations, such as curriculum developers, teacher trainers and textbook publishers.

6.1 LIMITATIONS OF THE STUDY

Educational research is rife with limitations, in many cases due to situations beyond the control of the researcher. The limitations of the instruments used for this study have already been discussed in Chapter 3, section 3.6. It is important to highlight these limitations as they can impact on the validity of the results obtained and conclusions drawn from the results obtained using such instruments. The following paragraphs address limitations of other factors that may lower the validity of the research findings.

6.1.1 Lack of piloting of some instruments

Opie (2004) emphasizes the importance of doing a pilot study. Piloting of the research instruments should be done to ensure that instructions are clear, questions are understandable, and language and grammar are comprehensible for the respondents. The teachers’ activity-based questionnaires in this study were not piloted because of time constraints. However, face-validation of the questions by the science education expert played a major role in improving the validity of the instrument. The expert had already predicted problems that could arise and those were fixed before the main study. However, piloting the instrument could have given a better picture because then the respondents would be able to give comments on language clarity and on whether questions were understandable. A number of teachers (11 of the 28) left the first question from the activity-based questionnaires unanswered, possibly because they might not have understood what the question wanted.

6.1.2 No responses or incomplete responses

The data set was incomplete for some questions because some respondents either gave no answer at all to some questions or gave incomplete answers. It was difficult for the researcher to decide whether those teachers did not understand the questions, did not know the answers, or were simply not interested. No responses greatly reduce the number of respondents from an already small sample, thus limiting chances of generalizing the results to the population concerned.
6.1.3 Use of convenience sampling

As indicated in Chapter 3 under the section 3.5 page 33 on sampling, convenience sampling was used in this study. I mentioned that such samples are often biased, as the group may have features that are not representative of the target population. The teachers who attended the workshop were teachers who meet on regular basis to discuss their work. This makes them different from other teachers who may not be so dedicated to their work, as they are more professional. I might have got different responses if I had taken a different group of teachers, so the result cannot be claimed to be representative of all Junior Secondary Science teachers in Lesotho.

6.1.4 Problems with self-reporting

In some sections of the questionnaires teachers were asked to think about their practices and report on the activities they used. Allowing teachers to report on what they did is a disadvantage, as Tuckman (1978) indicates that when people self-report they may give answers that they think the researcher wants to hear, which may not necessarily reflect the truth of the matter. Classroom observations would have been more appropriate, and would give a truer picture of teachers’ practices so that judgments could be made about whether activities were activity-based and learner-centred, but time was not on my side. However, the atmosphere for the workshop and interviews were conducive for open and honest responses.

6.2 SUMMARY OF THE FINDINGS

The results of the study were already reported and discussed in detail in Chapters 4 and 5. This section only gives a summary of the results, with the purpose of answering the research questions.

6.2.1 What changes does the new curriculum require teachers to make in their classroom?

It is important that the requirements of the new curriculum are clear to all people concerned, especially curriculum developers, as they are the ones who have to communicate the requirements to the teachers. Analysis of the syllabus document as the main document available to teachers revealed that the new curriculum requires teachers to

• use a learner-centred approach,
• make greater use of activities,
• develop skills,
• develop appropriate attitudes.

Curriculum developers were also asked to indicate the changes the new curriculum expect teachers to make, and analysis of their responses indicates that

• None of the panel members interviewed gave all four requirements of the curriculum. Only two of the four indicated actively involving learners in the learning process, and only one curriculum
CHAPTER 6: Summary of the findings, and recommendations

developer saw the acquisition of skills as a requirement. None of them volunteered making lessons learner-centred as a requirement, and none mentioned the development of appropriate attitudes.

These results suggest that although the curriculum developers drew up the syllabus document they do not seem to be aware of all the requirements of the new curriculum. This is a point of concern because curriculum developers are supposed to be the ones to give directions to teachers about how they should go about putting the requirements into practice. Fullan (2001) has indicated that successful implementation of innovation requires knowledgeable and experienced change agents. If the curriculum developers have little knowledge about the requirements one cannot expect them to communicate the requirements effectively to teachers, which could have a serious impact on successful implementation of the curriculum.

6.2.2 What did the curriculum developers mean by “learner-centred approach” (in the syllabus document)?

The results indicate that three of the four curriculum developers interviewed did not give the meaning of learner-centredness as indicated by the literature, and that all four curriculum developers seemed to have different interpretations of what “learner-centred approach” means, as discussed below.

- Only one curriculum developer gave an appropriate explanation (based on what the literature says) of the concept of learner-centredness, including accommodating learners’ differences in interests, learning abilities, and (where appropriate) allowing learners an element choice about what they want to learn and how they want to learn it.
- The rest of the curriculum developers gave an explanation that simply repeats the words learner-centred such as stating that learners are central to learning, or equated learner-centredness with either relevance or actively engaging learners in the learning process.

A learner-centred approach is clearly stated as a requirement in the syllabus document and as such one would expect the curriculum developers to be knowledgeable about such an important concept. The term “learner-centred approach” seems to be taken at face value, and people do not seem to analyse its meaning to look at it more deeply. The results, however, indicate that the curriculum developers understand the term differently to the way explained in literature. This could pose problems as curriculum developers are meant to be facilitators of change.

6.2.3 What did the curriculum developers understand by “activity-based” lessons?

Curriculum developers’ thorough understanding of the concept of “activity-based learning” concept before they pass it to teachers is very important, because it is easily confused with just doing activities. The results of this study show that
• Two of the curriculum developers’ who answered this question focused on the obvious - that learners should be engaged in activities, - but gave no clear indication of the purpose those activities serve.

• One curriculum developer perceives engaging learners in activities to be confined to doing practical work and manipulating apparatus.

Taking “activity-based” to mean involving learners in practical work confirms what Carin and Sund (1980) suggested. If curriculum developers realized this they would be in a better position to help teachers.

6.2.4 **Lesotho Junior Secondary Science teachers’ understanding of the requirements**

a. **What do Lesotho Junior Secondary Science teachers’ believe the requirements of the new curriculum are?**

This question assumes that if teachers clearly understand the requirements of the curriculum they can effectively put them into practice. However, in this study

• A reasonably large proportion of the teachers who completed the questionnaires (11 of the 28) did not respond to this question.
• A small number of teachers (13 of the teachers, just under half of the group) correctly indicated that the syllabus expects them to involve learners in activities or in practical work.
• A very small percentage of teachers (five) correctly stated that the syllabus requires them to use a learner-centered approach.
• Two others gave the features of learner-centredness without using the term.
• About a fifth of the teachers (six) mentioned that teachers were expected to teach skills.
• One teacher mentioned the development of attitudes.

The results indicate that while a number of these teachers acknowledge use of activities, and use of learner-centred approach as requirements of the new curriculum, the development of skills and attitudes do not receive that much recognition. Walters and Soyibo (2001) and Sanders (2007) have indicated that skills can be taught and learned only if teachers make them specific outcomes of their teaching. So if teachers do not recognize development of skills and attitudes as requirements it follows that they may not target them in their teaching. The fact that a large number of teachers did not mention all the requirements of the new curriculum has direct bearing on the kind of training teachers received. The teachers’ lack of knowledge might be attributed to the fact that they were not told what the requirements are.

b. **What do Lesotho Junior Secondary Science teachers understand by “learner-centred approach”?**

A learner-centred approach requires that teachers recognize and accommodate learner differences in their practices, a point which teachers must understand. In this study
• Thirteen of the teachers gave responses that suggested some features of learner-centredness.

• A large number (thirty-two) of the answers focused on activities, suggesting that the majority of the teachers seemed to believe that “learner-centered” refers to active involvement of learners in the learning (i.e. they see “learner-centredness” as “activity-orientated).

• Nine other teachers (just under a quarter) gave an “obvious” description of “learner-centered approach”, simply stating that learners are central to learning.

These answers imply that a large number of teachers do not fully comprehend the concept of learner-centredness, which is understandable because only about seven of the teachers indicated using learner-centred approach as a requirement of the new curriculum. If teachers do not know the meaning of the term “learner-centred”, one would not expect them to be able to put it into practice in the classroom.

c. What do Lesotho Junior Secondary Science teachers understand by “activity-based lessons”?

It is important that teachers understand the concept of activity-based learning and can distinguish it from using a learner-centred approach, so that they can effectively implement the two approaches.

• Three teachers gave answers at the “obvious level” which only repeated the wording of the term.

• Eighteen (just over half) of the teachers emphasized the need for learners to do practical work or experiments.

• Eighteen of the teachers (just over half of the group) gave a correct (according to literature) explanation of the concept of “activity-based learning” as they indicated that learning is derived from or based on activities.

Even though some teachers indicate that learning comes from doing activities, a large percentage (just over half of them) still warrants concern. As with the concept of learner-centredness, activity-based learning appears to be taken at face value, without necessarily thinking deeply about it. As long as activity-based learning is equated with just doing activities it will not be appropriately put into practice.

6.2.5 In terms of the current teaching of Form B and C:

a. to what extent do Lesotho Junior Secondary Science teachers think they are using the new approaches when they teach the topic of breathing and respiration?

It was important to get an indication of whether teachers were putting the new approaches into practice as expected by the curriculum developers.

• 28 teachers indicated that their learners did activities when they were teaching breathing and respiration. However, the activities they listed made it difficult to tell if they were truly activity-based, because teachers did not explicitly explain how the activities were used, and the sequencing of activities in relation to learning.
• Although seventeen teachers (just over half of the group) indicated that they used a learner-centred approach, the activities they listed do not reflect any of the features of a learner-centred approach being put into practice.

• Thirteen teachers indicated that they taught skills, but five of these teachers gave inappropriate (not skills) examples of skills while another three listed activities not skills.

As can be seen from the quotes above, many of the teachers’ believed they were putting the new approaches into practice, but looking at the activities they listed there seem to be a mismatch of what they say they are doing and the activities listed.

b. how well do they believe they are coping with the approaches and why?

• Three of the four teachers who were interviewed indicated that they are coping with the demands of the curriculum and expressed interest in the syllabus. One teacher feels she is not coping at all and would like to be trained. However, the interviewed teachers expressed some problems that made putting new approaches into practice difficult as shown in Figure 2 on page 89.

c. what help do they say they need?

• One teacher indicated that they need to be given more training about how they should go about the syllabus.

These findings provide a picture which suggests teachers’ lack of understanding of what they are required to do. As Ogborn (2002) has indicated in the face of the problem teachers will have no choice but to implement the curriculum the way they think is best. As a result there will be no clear change in teachers’ practices in the classroom even though they may claim to be using the new approaches. Teachers’ lack of knowledge may be an obstacle inhibiting implementation of the new approach to the teaching of the Junior Secondary Science curriculum in Lesotho.

6.2.6 To what extent do the support documents (policy documents, Junior Secondary Science syllabi and available Science textbooks and teacher’s guides) help teachers to promote the new goals (relating to skills and attitudes as well as knowledge) and approaches, with particular reference to the teaching of breathing and respiration?

Generally the support materials did not make the requirements very clear. They mentioned that two main requirements (learner-centred approach and activity-orientated learning) be used. However, they do not offer an explanation of the terms. The guidance given on how to put some of these requirements in practice is frugal and lacking in specifics, as shown in Table 13 on the next page.
### Table 13. A summary of guidance provided by the support materials

<table>
<thead>
<tr>
<th>Guidance on:</th>
<th>Syllabus document</th>
<th>Teacher’s guide</th>
<th>Textbooks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learner-centred</strong></td>
<td>Requirement stated? States that a learner-centred approach should be used.</td>
<td>States that a learner-centred approach should be used.</td>
<td>States that a learner-centred approach should be used.</td>
</tr>
<tr>
<td></td>
<td>Terms defined</td>
<td>Meaning of learner-centred not given. Learner-centred equated with active learner involvement</td>
<td>Recognizes learner differences in abilities, as it indicates that the books include exercises for a wide range of students’ ability.</td>
</tr>
<tr>
<td></td>
<td>Guidance on how to put it into practice</td>
<td>Little guidance given to help teachers understand the concept of learner-centredness or how to implement it.</td>
<td>No reference made to learner differences anywhere in the book.</td>
</tr>
<tr>
<td><strong>Activity-based Learning</strong></td>
<td>Requirement stated</td>
<td>Does not mention activity-based learning, instead emphasises use of activities such as doing practical work.</td>
<td>Does not mention activity-based learning, but emphasises use of activities</td>
</tr>
<tr>
<td></td>
<td>Term defined</td>
<td>Term not defined</td>
<td>Term not defined</td>
</tr>
<tr>
<td></td>
<td>Guidance on what skills to teach</td>
<td>Use of activities as basis of learning not made explicit.</td>
<td>Repeatedly indicates that activities should be done to support theory already taught</td>
</tr>
<tr>
<td></td>
<td>Guidance on how to teach skills</td>
<td>No guidance given</td>
<td>Use of activities for knowledge construction not emphasized.</td>
</tr>
<tr>
<td><strong>Development of Skills</strong></td>
<td>Requirement stated</td>
<td>Suggests that skills be taught.</td>
<td>Three of the ten aims of the course refer to learning of skills which suggests that skills need to be taught</td>
</tr>
<tr>
<td></td>
<td>Guidance on what attitudes to teach</td>
<td>Some skills spelled out under mission statement, but others scattered and embedded in content. Not easy to identify them.</td>
<td>Mentions skills of co-operative learning, communication, and evaluating achievement and progress, comparing and contrasting, and conducting experiments.</td>
</tr>
<tr>
<td></td>
<td>Guidance on how to teach attitudes</td>
<td>No guidance given</td>
<td>Guidance on how to teach skills is limited to teaching the skill of report writing. Some guidance about learners evaluating their achievement lacks detail.</td>
</tr>
<tr>
<td></td>
<td>Requirement stated</td>
<td>States that learners are expected to acquire attitudes</td>
<td>No guidance is given about the teaching of other skills that are required by the syllabus</td>
</tr>
<tr>
<td></td>
<td>Guidance on what attitudes to teach</td>
<td>Attitudes listed under mission statement</td>
<td>The back cover of the teacher’s guides and one of the aims of the course indicate that there should be development of attitudes</td>
</tr>
<tr>
<td></td>
<td>Guidance on how to teach attitudes</td>
<td>No guidance given</td>
<td>No further reference to attitudes</td>
</tr>
<tr>
<td></td>
<td>Requirement stated</td>
<td>States that a learner-centred approach should be used.</td>
<td>The back cover of the teacher’s guides and one of the aims of the course indicate that there should be development of attitudes</td>
</tr>
<tr>
<td></td>
<td>Guidance on what attitudes to teach</td>
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</tr>
</tbody>
</table>
6.2.7 A summary of factors that could affect implementation of the new curriculum

The responses from the questionnaires and interviews revealed a number of factors that could affect the implementation of the curriculum as summarized in Figure 2 below.

![Factors affecting implementation diagram]

Figure. 2. A summary of factors found to be affecting implementation

6.3 RECOMMENDATIONS

The above summary of findings has implications for the people concerned, such as curriculum developers, teacher trainers, and textbook publishers. The following recommendations are made based on the findings.

6.3.1 Recommendations for curriculum developers

According to Ogborn (2002) and Hall and Hord (2006) teachers will make their own interpretation of what they think the curriculum requires if they are not given adequate information. The results of this study indicate that the curriculum developers seem not to be aware of some of the requirements of the curriculum, and that the syllabus document as the main document gives teachers too little direction about
the requirements for them to successfully implement the expected requirements. I therefore suggest that the curriculum developers should try to understand the terms themselves and agree on the meaning they will give to teachers during training. The syllabus should be revised, and that the following should be made clear:

- The requirements of the curriculum should be explicitly stated as such.
- The terms used should be defined.

Furthermore, the revised syllabus should be used during in-service training, and discussed with all teachers attending workshops. Appropriate training with the proper documents suggests that at least teachers will know the requirements of the new curriculum.

### 6.3.2 Recommendations for teacher-trainers

One of the concerns that teachers expressed in the interview is that they received inadequate or no training. Teachers have to be given more training and the training should make the requirements of the new curriculum a focus so these requirements should be clearly stated and explained to all teachers, with clear guidelines of what they are expected to do in the classroom. So I suggest that more good quality in-service workshops be run for teachers, and pre-service courses should also focus on the requirements. Teachers play an important role in implementation of the curriculum as they are the ones who put new ideas into practice in the classrooms.

### 6.3.3 Recommendations for textbooks publishers

Support materials play an important role in ensuring good implementation of a new curriculum, as stated in Chapter 2, section 2.4.2, pages 28-29. Support materials need to be well developed, and in line with the requirements of the new curriculum.

**Teachers guide:** Teacher’s guides as the name implies, are very important documents for teachers. My first suggestion is that all textbooks must have accompanying teacher’s guides. Even though the analysed teacher’s guides indicate that a learner-centred approach be used, the term is not defined, and although one publisher has stated some of the features of a learner-centred classroom, these features are physically separated from the term. It would be more useful to see the terms clearly explained and features of each term stated as such in the teacher’s guides. It would also be more meaningful if clear guidelines are given as to how teachers should go about making classes learner-centred. Development of skills and appropriate attitudes is another requirement of the new curriculum. But development of skills and attitudes is not given much emphasis in the teacher’s guides. Skills are competencies that can be taught and learned. So I suggest that the teacher’s guides should explicitly state the skills and attitudes that have to be learned, and should also give clear guidance to teachers about how they should go about teaching each skill (see Appendix H as an example of how they can do it).
Textbooks: Textbooks’ chapters should have activities meant to help put the new approaches into practice. Support materials analysed encouraged greater use of activities, but put more emphasis on using practical work to support theory. Using activities to engage with the concepts helps learners to construct their ideas, as would be expected in an activity-based lesson. This is in line with changes worldwide, and is well supported by constructivist theory. So it would be meaningful to see activity-based practices being emphasized in the textbooks. The chapters in the textbooks need to have a variety of activities starting the learning, and these activities should be able to engage learners meaningful in constructing their knowledge. The textbook chapters should also have activities meant to help develop skills and attitudes and to perfect the skills learned.

6.4 CONCLUDING REMARKS

This study has revealed a number of factors that could hinder teachers from proper implementation of the new curriculum as shown in Figure 2 on page 89. These factors include lack of policy documents as important documents that give direction about the new curriculum. The other factors involve the fact that curriculum developers’ and teachers’ seem not to be aware of all the requirements of the new curriculum. The support materials analysed give little guidance about how the new approaches should be put into practice. It is obvious from the results that these factors have to be dealt with for the successful and effective implementation of the new curriculum.