A Study of the Minimum Level of Learning in Biology for Ninth Class of U.P. Board of Secondary Education

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Abstract

The Minimum Level of Learning (MLL) strategy for improving the quality of elementary education is an attempt to combine quality with equity. Objectives of this study- To determine content of MLL on the basis of text book of class 8th in biology and to know the achievement level of 9th class on the basis of determined MLL. Descriptive Survey method was used by the researcher to know the MLL in Biology. A purposive sampling technique was used for the present study and 10 biology teacher and 150 students of class IX from secondary schools of Agra were selected as a sample. A self made test will be prepared by the researcher to determine the content of MLL in Biology and text book of Biology for class VIII. Percentage and graphical representation techniques were used for the analysis of data. On the basis of test result it was concluded that students of class IX have not mastered in the 18 item of these three skills- Terminology, Concept and Diagram.

INTRODUCTION

The Minimum Level of Learning (MLL) strategy for improving the quality of elementary education is an attempt to combine quality with equity. It lays down learning outcomes in the form of competencies or levels for learning for each stage of elementary education. The need to lay down MLL emerges from the basic concern that irrespective of caste, creed, location or sex, all children must be given access to education of a comparable standard.

MLLs in terms of learning competencies expected to be mastered by every child by the end of a particular class or stage of education. Each competency
can be further delineated in terms of sub-competencies while specifying the content inputs or while measures of learning. The set of MLLs would actually represent the rational criteria adopted for judging the adequacy of the curricular inputs provided and the learning outcomes to be expected (Kureen, 1991).

Two basic considerations kept in view while formulating the MLLs are-
1. The cognitive capabilities of the children at different classes or grades corresponding to different stage of development
2. The empirical reality in terms of the enabling environmental conditions that characterize the primary education programmes.

MLLs attempt to give the teacher a clear cut idea of the expected:
1. Learning objectives
2. Teaching objectives
3. Learning outcomes

Thus with the help of the MLLs teacher will be able to
1. Emphasise on developing the expected competencies among the learners
2. Adopt a suitable approach and methods in the teaching learning process
3. Evaluate the learner’s achievement effectively by choosing appropriate methods.

The MLL is thus seen as one of the important prerequisites for infusing a sense of direction to the system and there by paving the way for improving its accountability.

The MLL also provide tool for effective programme formulation for school improvement. In this way the quality of schools can be judged in terms of learning and performance capabilities of students and graduates rather than the quality of buildings and qualification of teachers (Tripathi, S, 1991).

Many programmers have been organized to raise the level of learning at national level. Education commission (1964-66) has emphasized that student of all school should attain the determined level of learning.

In 1978, NCERT had started a project with the help of UNISEF entitled as “Primary Education Curriculum Renewal” in which many states participated. In this project, work done for the improvement in the levels of learning of students after determining the MLL. The primary education curriculum renewal project was evaluated in 1984.

National policy on education 1986 stated as:
1. Improving the unattractive school environment, building condition and lack of instructional material.
2. Laying down of minimum levels of learning which all students should achieve.
Using the evaluation and following the National Policy of Education 1986, NCERT prepared another document titled “Minimum Level of Learning at Primary stage”.

In December 1989, Human Resource and Development (Education Department) had organized seminar on the basic needs and achievement level by which MLL at primary level was pondered upon. Then Department of Education, MHRD formed a committee in January 1990 with following goals-

1. Draw up MLL’s for class III and V.
2. Recommend a procedure for comprehensive learner evaluation and assessment.

In these reference agencies at national level as-NCERT, CBSE and proposed national evaluation organization should determine desired achievement level. NCERT has kept-“ensuring quality education for all” in national framework-2005 to make national educational system more efficient which will be possible only after the determination and achievement of MLL.

The world of today is the world of globalization. The state in which we find ourselves now is due to the advancement of science, maths, technologies etc. But now a day’s biology is the emerging field which deals with the study of varieties of living organisms including ourselves. Biology as a separate science was developed in the nineteenth century as scientists discovered that organisms shared fundamental characteristics. Biology is now a standard subject of instruction at schools and universities around the world.

The importance of biology in our daily lives lies in the fact that biology attempts to find out the unifying principle that exists among diverse organisms having morphological and functional inequalities. Biology consists of three basic skills: Concept, terminology, diagrams and the fundamental objective of biology teaching is the development of these skills.

The concept of minimum level of learning is emerged due to the quality problem of education learning is different so the level is defined which is applicable to all students. Thus the concept of minimum level of learning is came out which is necessary for all the students. (Singh Vasudha, 2007) Minimum level of learning is also defined in terms of learning competencies expected to be mastered by every child by the end of a particular class or stage of education. Minimum level of learning would actually represent the rational criteria adopted for judging the adequacy of the curricular inputs provided and the learning outcomes to be expected.

It is expected that MLL will provide an effective tool for programme formulation for school improvement. The quality of a school or educational system should, in the real sense, be defined in terms of the performance capabilities of its students.
OBJECTIVES OF THE STUDY
Following objectives are framed by the researcher:

1. To determine content of MLL on the basis of text book of class 8th in biology.
2. To know the competencies of 9th class on the basis of determined MLL.
3. To test student of class 9th in three skills: concepts, terminology, diagrams

RESEARCH DESIGN
The research design will include the following:

SAMPLE
A sample of 10 biology teacher and 150 students of class IX from Secondary schools were selected from Agra on the basis of purposive sampling technique.

METHODOLOGY OF THE STUDY
The “Descriptive Survey method” has been used by the researcher to know the MLL in Biology.

TOOLS OF THE STUDY
1. A test will be prepared by the researcher to determine the content of MLL in Biology (zoology) from the text book of biology.
2. MLL test will be prepared to test the competencies and skills.

VALIDITY AND RELIABILITY OF TEST
Since test is self made and the test is evaluated by subject experts to determine its validity and reliability whether it will be able to test MLL of the students or not thus, its validity and reliability have been determined by subject experts.

STATISTICAL TECHNIQUE
Investigator has used percentage and graphs to know MLL of each question.

DATA ANALYSIS AND INTERPRETATION
The test has been constructed in three following heads- TCD-

1. Terminology
2. Concept
3. Diagram

Percentage of those students who have give wrong answers in these skills have been discussed below

Determined MLL Learning skill- Terminology
For this skill, description of the percentage of those students who have given
wrong answers have been shown in the following table-

Table 4.1.4 Description of the percentage of those students who have given wrong answer in Terminology skill

<table>
<thead>
<tr>
<th>Name of skill</th>
<th>Item No.</th>
<th>Description of items</th>
<th>MLL</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminology</td>
<td>1.1.1</td>
<td>Name of organism which are not seen by necked eyes</td>
<td>96</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>1.1.2</td>
<td>Name of male reproductive system</td>
<td>101</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>1.1.3</td>
<td>Name of the microorganism which causes diseases</td>
<td>110</td>
<td>92%</td>
</tr>
<tr>
<td></td>
<td>1.1.4</td>
<td>Definition of antiseptic</td>
<td>119</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>1.1.5</td>
<td>Term for measurement unit of microorganism</td>
<td>105</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td>1.1.6</td>
<td>Name of glands which secretes the hormones</td>
<td>99</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td>1.1.7</td>
<td>Term for Changes in animals</td>
<td>97</td>
<td>80%</td>
</tr>
</tbody>
</table>
After observing table it is clear that students have not achieved MLL in the item 1.1.1 of Terminology skill that is students name the organisms which are not seen by necked eyes. In this item 80% students have not got mastery. This shows that students have not studied the content of class VIII thoroughly. As seen by the MLL test.

Item 1.1.2- students name the male reproductive system is related with understanding capacity of students in simple terminology of Biology. In this item, 85% students have not got success. This shows that students are unable to term the biological words that they supposed to do. The fault on the part of teacher because teacher not teaches her students thoroughly and students are also not read the chapter completely.

Item 1.1.3- is related with the terminology of microorganism. In this item 92% student have not got success that shows students have not got mastery. Reason behind this is that the teacher does not concentrate on whole chapter or course. Only specific content is taught.

Item 1.1.4- is concerns with the definition of biological terms. By observing the table 4.1 we can say that 100% students gave the wrong answer on that particular item. Thus, like other items in this item also, students have not attained mastery. The reason behind this is that students not understand the whole chapter or content they only learn the exercise part. Teachers are also not concentrating on the main biological terms.
Item 1.1.5- is related with the student’s ability to know the terminology of measurement unit of microorganism. 87% students are those who gave the wrong answer on this item. There is a gap of only 7% in getting the mastery in this item. This shows student’s weakness in the biological terminology.

Item 1.1.6- is related with the name of glands which secrets hormones. By observing the table, it is clear that students have attained minimum success that is only 83% students gave the wrong answer. In this item also students have not get MLL but they are quite nearer to the mastery level. As determined by the test.

Item 1.1.7- is related with the term for changes in animals. In this item 80% students gave the wrong answer. Reason behind this is the students not understand the chapter carefully and the home work is not properly done by them. As told by their teachers.

Thus on the basis of above mentioned analysis, investigator can conclude that students have not attained mastery in any of these items. The main reason behind this that teachers not concentrate on whole content only specific content is taught by teachers in the classes. They only concentrate on the exercise part. Thus it is difficult to students to name the appropriate biological terms.

**Determined MLL Learning Skill -Concept**
The description of the percentage of those students who have given wrong answer in the concept skill have been shown in the table-

Table-4 Description of the percentage of those students who have given wrong answer in Concept skill

<table>
<thead>
<tr>
<th>Name of skill</th>
<th>Item No.</th>
<th>Description of items</th>
<th>MLL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>% of students who answered incorrectly</td>
</tr>
<tr>
<td>Concept</td>
<td>2.1.1</td>
<td>Process of reproduction in animals</td>
<td>94%</td>
</tr>
<tr>
<td></td>
<td>2.1.2</td>
<td>Process of reproduction in unicellular animals</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>2.1.3</td>
<td>Concept of evaluation</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td>2.1.4</td>
<td>Concept of fossils</td>
<td>82%</td>
</tr>
<tr>
<td></td>
<td>2.1.5</td>
<td>Blood group classification</td>
<td>81%</td>
</tr>
<tr>
<td></td>
<td>2.1.6</td>
<td>Match the column</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>2.1.7</td>
<td>Place where red blood cells are found</td>
<td>80%</td>
</tr>
</tbody>
</table>
Item 2.1.1- is related with the concept of process of reproduction in animals. In this item 94% students have not got mastery. So they not got the MLL in that item.

Cause of this deficiency is that teaching method is traditional method. So students are not taught by the demonstration or lecture cum demonstration method.

Item 2.1.2- is related with concept of process of reproduction in unicellular animals. In this item 90% students gave wrong answer. The gap between the mastery level is about 10%. Reason behind this is that students are extremely weak in fundamental concepts of Biology that they are supposed to be mastered.

Item 2.1.3- is related with the evaluation concept. In this item, students have not attained MLL. 83% students have given wrong answer on that item. The gap between the mastery level is only about 3% that is they are nearer to
the mastery level.

Reason behind this is that teacher focus on rote memorization by students. With the result of this, students are not able to give the answer of simple questions.

Item 2.1.4- is related with the concept of fossils. In this item 82% student gave wrong answer. So they not attained the MLL. Reason behind this deficiency is that students are not aware of simple biological concept. Teachers not give emphasis to understand the concept of biology but only emphasis on completion of the course.

Item 2.1.5-is related with the concept of blood group classification. In this item 80% students gave the wrong answer. They are at the line of MLL. This type of item should clear in the students because this item is related with the biological concepts which are related with the daily life.

Item 2.1.6 is related with the matching of column which includes concept of the different biological terms. In this item 80% students gave the wrong answer. Cause of this deficiency there is only one period of 30 minutes only in which biology was taught so this time period is not enough to understand the whole chapter therefore students give emphasis to rote memorization.

Thus, on the basis of above mentioned analysis, researcher can conclude that students not attained the MLL in concept skill. The reason behind the deficiency related with concept skill lies with students and teachers. Teaching method is traditional. There is lack of demonstration or project method.

Determined MLL Learning skill- Diagram
The above mentioned table shows the percentage of those students who have given wrong answer in the diagram skill-

Table-5 Description of the percentage of those students who have given wrong answer in Diagram skill

<table>
<thead>
<tr>
<th>Name of skill</th>
<th>Item No.</th>
<th>Description of items</th>
<th>MLL % of students who answered incorrectly</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagram</td>
<td>3.1.1</td>
<td>Identification of the diagram of fungi</td>
<td>94%</td>
<td>Incomplete</td>
</tr>
<tr>
<td></td>
<td>3.1.2</td>
<td>Identification of the diagram of bacteria</td>
<td>91%</td>
<td>Incomplete</td>
</tr>
<tr>
<td></td>
<td>3.1.3</td>
<td>Identification of the diagram of algae</td>
<td>98%</td>
<td>Incomplete</td>
</tr>
<tr>
<td></td>
<td>3.1.4</td>
<td>Identification of diagram of virus</td>
<td>93%</td>
<td>Incomplete</td>
</tr>
</tbody>
</table>
Item 3.1.1- is related with the diagram skill which includes the identification of the diagram of fungi. In this item 94% students gave the wrong answer.

Item 3.1.2- is related with the diagram skill which includes the identification of the diagram of bacteria. In this item 91% students gave the wrong answer.

Item 3.1.3- is related with the diagram skill which includes the identification of the diagram of algae. In this item 98% students gave the wrong answer. This shows poor performance of students.

Item 3.1.4- is related with the diagram skill which includes the identification of the diagram of virus. In this item 93% students gave the wrong answer.

Students are not aware about the simple diagrams of biological concepts. Students are not able to identify the diagrams of microorganism. The cause of this deficiency is students are not taught by pictorial representation. They have no fundamental understanding of any diagram skill. There is lack of demonstration method only lecture method is used by the teachers. In examination there is lack of questions which are related with the diagram skill. There is no more emphasis on the practice of diagrams which are related with the biological concept.
Table-6 List of items or contents which are considered as MLL

<table>
<thead>
<tr>
<th>Item no</th>
<th>Name of skill</th>
<th>Description of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Terminology</td>
<td>Name of organism which are not seen by necked eyes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name of male reproductive system</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Name of the microorganism which causes diseases</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Definition of antiseptic</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Term for measurement unit of microorganism</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Name of glands which secrets the hormones</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Term for Changes in animals</td>
</tr>
<tr>
<td>1</td>
<td>Concept</td>
<td>Process of reproduction in animals</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Process of reproduction in unicellular animals</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Concept of evaluation</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Concept of fossils</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Blood group classification</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Match the column</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Place where red blood cells are found</td>
</tr>
<tr>
<td>1</td>
<td>Diagram</td>
<td>Identification of the diagram of fungi</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Identification of the diagram of bacteria</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Identification of the diagram of algae</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Identification of diagram of virus</td>
</tr>
</tbody>
</table>

Achievement level of class IX students in Biology on the basis of determined MLL test

Achievement of class IX students in Biology is shown in the table 4.2.1. The achievement level is calculated on the basis of determined Minimum Level of Learning.
Table-7 Description of achievement level of class IX students in Biology on the basis of determined MLL test

<table>
<thead>
<tr>
<th>Class intervals (marks of students)</th>
<th>Frequency No of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-50</td>
<td>5</td>
</tr>
<tr>
<td>40-45</td>
<td>6</td>
</tr>
<tr>
<td>35-40</td>
<td>7</td>
</tr>
<tr>
<td>30-35</td>
<td>11</td>
</tr>
<tr>
<td>25-30</td>
<td>21</td>
</tr>
<tr>
<td>20-25</td>
<td>30</td>
</tr>
<tr>
<td>15-20</td>
<td>23</td>
</tr>
<tr>
<td>10-15</td>
<td>12</td>
</tr>
<tr>
<td>5-10</td>
<td>5</td>
</tr>
<tr>
<td>0-5</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>N= 120</td>
</tr>
</tbody>
</table>

This table describes the achievement of students on the basis of test. In this test the maximum marks is 50. There are only 5 students who got the marks between 45 to 50. 30 students got the marks between 20-25 and 23 students got the marks between 15-20. 12 students got the marks between 10-15 and 5 students got the marks between the 5-10. Only 18 students cross the MLL level. They attain mastery in the content of biology. But 102 students fail to achieving 80% marks, they constituted contents of MLL.

Summary of table

<table>
<thead>
<tr>
<th>Marks (in percentage)</th>
<th>Total no of students</th>
<th>Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above than 60%</td>
<td>29</td>
<td>First</td>
</tr>
<tr>
<td>45% to 60%</td>
<td>39</td>
<td>Second</td>
</tr>
<tr>
<td>33% to 53%</td>
<td>35</td>
<td>Third</td>
</tr>
<tr>
<td>Less Than 33%</td>
<td>17</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Summary table describes the achievements of students on the basis of percentage of marks determined by the test. In this test 29 students got 60% marks and they attained first division. 39 students got marks between the 45% to & 60% and attained second division. 35 students got marks between the 33% to 53% and achieved third division and 17 students got marks lesser than 33% and they are got failure in the test. From the table 4.2.1 it is evident that the result of students studying in class IX have poor achievement. They need special attention for mastery of the content.
FINDINGS OF THE STUDY
The findings of present study is related to the test results and the test has been constructed in three following heads- TCD-
1. Terminology
2. Concept
3. Diagram

Determination of Minimum Level of Learning for class IX students in Biology on the basis of textbook of class VIII in reference to the three skills- TCD.

Learning skill- Terminology.
In the test there is 24 items which are related to the terminology skill. From the 24 items there are 7 items in which the students not shown the mastery and these items are come under the category of MLL.
1. In order to know the name of organism which are not seen by necked eyes in this 80% student have gave the wrong answer. 85.1% students gave wrong answer which has been related with the name of male reproductive system.
2. 92% students not gain the mastery which is related with the name of the microorganism which causes diseases.
3. In order to know the definition of antiseptic 99% students gave the incorrect answer.
4. 87% students not shown the mastery which is related to the measurement unit of microorganism
5. In order to know the name of the gland which secrets hormones 87% students gave the incorrect answer.
6. In order to know the term for changes in animals 80% student not got the mastery.

Thus researcher concluded that in terminology skill, students not shown the mastery in some of the items so these items come in the category of MLL.

Learning skill- Concept
In this skill items related to concept have been kept. There are total 21 items which is related to the concept skill. From the 21 items 7 items are those which are considered as determined MLL.
1. In order to know the process of reproduction in animals in which 94% students gave the wrong answer.
2. 90% students not gave the right answer which is related with the process of reproduction in unicellular animals.
3. In order to know the concept of evolution in this 83% student gave the wrong answer.
4. 82% students not got the mastery which is related with the concept of fossils.
5. In order to know the concept of blood group classification in this item 81% student gave the wrong answer.
6. 80% student not got the mastery in the match the columns.
7. 80% students gave the wrong answer which has been related with the concept of place where red blood cells are found.

Thus researcher concluded that in concept skill students not achieved the mastery in these items. These seven items come in the category of the MLL.

**Learning skill- Diagram**
In this skill, items related to diagram have been kept. There are total six items in this skill. From the six items 4 items are considered as determined MLL.

1. In order to know the identification of diagram of fungi 94% student did not give the correct answer.
2. In order to know the identification of the diagram of bacteria 91% students did not give the correct answer.
3. 98% students gave the wrong answer which is related with the identification of the diagram of the algae.
4. In order to know the identification of the diagram of virus in this 93% student gave the wrong answer.

These findings show that students are weak in the skill of diagram. They are not able to identified the simple diagram and also weak in diagram construction.

Thus students neither in terminology, concept nor in diagram skill have shown complete MLL. On the basis of above result researcher concluded that in 18 items students are not able to give the correct response

**Findings regarding achievement of students**
Achievement of class IX students in the items of Biology textbook of class VIII have been discussed below-

1. Achievement of students are calculated on the basis of percentage of marks determined by the test. In this test 29 students got 60% marks and they attained first division.
2. Second division is attained by the 39 students got marks between the 45% to 60% and 35 students got marks between the 33% to 45% and achieved third division.
3. In this test 17 students got marks lesser than 33% and they are got failure in the test.
4. It is evident from the result that the students studying in class IX have poor achievement. They need special attention for mastery of the content.
CONCLUSION OF THE STUDY

On the basis of the achievement of students, it is clear that students of class IX have not mastered in the 18 item out of 53 items of these three skills- Terminology, Concept and Diagram. What are the causes of low educational achievements by students in Biology? In this reference, the investigator has interviewed with subject teacher and students to find the cause of low achievement.

On the basis of interview with teachers and students, causes of low achievements have been found out which are as follows-

1. Presence of students in class is often less due to which they are away from the knowledge imparted in class by their teachers.
2. Students are not taking interest to do their home work regularly.
3. Subject teachers use black-board rarely they uses lecture method while teaching in the class. Due to this, neither students take interest in learning nor do teachers take help of students in classroom teaching.
4. Students are not evaluated continuously. At school level, half yearly and yearly examinations are held due to which achievement level of students is not evaluated continuously.
5. Students are not shown their answer books but their marks are shown to them. Due to this students neither come to know about their mistakes nor do they improve them.
6. Students don’t go to subject teachers to solve their problems because of hesitation, fear and there is no healthy relationship between them.
7. It is found by conversation with students that teachers emphasis for rote memorization by students.
8. Students its self also not take interest to understand the whole chapter or content.
9. Students are not aware about the simple diagrams of biological concepts. The cause of this deficiency is students are not taught by pictorial representation. They have no fundamental understanding of any diagram skill.
10. There is lack of demonstration method only lecture method is used by the teachers. In examination there is lack of questions which are related with the diagram skill. There is no more emphasis on the practice of diagrams which are related with the biological concept.
11. There is no provision of audio-visual aids in the class room. Therefore students take less interest in Biology subject.

Thus, it is clear by above mentioned reasons that students have not attained mastery in Biology. By overcome these causes, MLL to some extent may be achieved by students of class IX.
REFERENCES


