Chapter 5

Development of Marking Scheme

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Introduction

One of the most recurring and difficult situations in classroom practice is assessing the quality and quantity of learning that has taken place. This is because teaching has intended outcomes that are geared towards behavioural change. In this regard, a good teacher assesses the progress of the students through tests, assignments among others using standardized criteria. It goes without saying that adopting a standard for marking students' scripts is a fantastic tool to help teachers ensure that marking is consistent across all students' scripts in a particular examination, test or assignment. Hence, this unit explores the development of a good marking scheme suitable for eliminating teachers' biasness when marking.

Behavioural Objectives

Participant should be able to do the following at the end of this unit:

i Explain the meaning and importance of marking scheme.
ii List the steps involved in preparing a marking scheme.
iii Describe how to improve marking scheme.
iv Explain the meaning of Table of Specification
v List the steps in developing a Table of Specification
vi Develop a Table of Specification.

What is Marking Scheme?

Marking scheme is a guide that a teacher uses to objectively award marks or scores, when assessing students' written work (usually an examination). It is in accordance to the above statement that Brown, Race & Smith, (1996) opined that the matrix-based instrument that equate the level of achievement against specific assessment criteria for an exercise to a grade descriptor is referred to as marking scheme. Also, a well-defined marking scheme helps the teacher to be explicit about the expectations of the students' performance. A good marking scheme will help the subject teacher to make his marking less subjective. It provides avenue to grade students' communication qualities which include the grammar, spelling, and word use. This means that if the teacher can comprehend the writing task of the student, then such student should be given an average grade of Credit. Therefore, it is imperative to mark the grammatical composition of the work, choice of words and correct spelling, separately so that the proportion of marks that will be lost by the students would be targeted to the language used as opposed to the actual content of the curriculum.

Importance of Marking Scheme to the Teacher

According to Dunn, Morgan, O'Reilly and Parry (2004), assessment defines curriculum, so does marking scheme define assessment. Many institutions of learning insist that marking scheme should be used by assessor or teacher due to the role it provides in reference assessment. Furthermore, it clearly shows how a student is graded, and the allotted marks for respective questions. It enhances consistency of scoring. This helps the teachers to standardize marking procedure so much so that different teachers assessing students' work with the same marking scheme should be able to grade students similarly. This is why Brew (2003) stated that marking schemes increase the validity and reliability of the assessment procedure. Validity counts in the sense that the marks are accurately awarded in consistency with the course or subject contents and 'reliability' in the sense that a similar marking or grading pattern is achieved by different teachers using the same marking scheme. Other importance of marking scheme to the teacher as put forward by Brown and Smith (1997) include:

I increased speed and fairness of the assessment process;

II increased speed in the feedback process;

III building of teacher's confidence and instructional performance; and

IV Elimination of teacher's biasness in the marking of students' scripts.

The importance of marking schemes also extends to the students as it has effect on their overall performance and achievement in a subject. Marking scheme helps students to recognize and meet up with teacher's expectations and encourages students' autonomy by promoting deeper learning. More so, it helps students to evaluate themselves which in turn builds their confidence in the teacher.

Steps Involved in Preparing Marking Scheme

The preparation of a good marking scheme entails that teachers stick to the learning objectives of module, and to the specific assessment, irrespective of the criterion used. Therefore, teachers cannot assess anything which has not been clearly taught to the students as a prerequisite. For instance, if spelling and grammatical blunders are not stated in the assessment criteria, a teacher cannot fail such students who have such errors in their tasks. Brown, Race and Smith (1996) outlined the following tips in preparing a marking scheme:

1. Marking sheet should be made available to the students and the contents should be discussed extensively before the set of the assessment. This will in turn help the students to comprehend the criteria for the assessment, and facilitate transparency in the assessment process. Also, there may be situations when the students may be confused with what is expected in terms of the presentation or content. The assessor may decide to design a prototype answer used previously or for the same period assessment. Obviously, the said prototype should be on related topic or concept exercise. Examples of students work from previous year and assessor comment with the permission of those involved are made available by some schools.
2. Preparation of marking scheme ahead of time by teachers facilitate validity and reliability of their assessment questions, in order to ensure that the questions actually test the materials to be tested and also to trigger possible alternative answers that may crop up.
3. Assessor should look at how other assessors of same course have done in assigning grades, because he is not the only person who teaches same course.
4. The marking scheme should be flexible such that non-experts can use it. In other word, the marking must be understandable by any teaching assistant and students respectively. A typical tool that can be used for this purpose is the rubric.

A marking scheme should only penalize repeated errors once the other response is sound. In other word, the marking scheme should give consequential marks.

On completion of the examination, the assessor should review the marking scheme, because some examinees may interpret the questions different from what the examiner intended. The assessor should review the marking scheme after the examination. Therefore, when students give quite answers slightly different from the content of the marking scheme, such students should be given partial marks.

Note making on examination is very important especially when marking. The note should be explicit on questions and allotted marks, because it will help the students to understand their mistakes on returning of the examination scripts or when a student appeals for the grade.

Awareness of students on the purpose and parameters of the examination underscores the need to notify the students on the objective of the examination or test. Assessor should jettison assumption that the student understands the pedagogical purpose of the examination, and should endeavour to communicate with the students extensively on the goals and desired outcome of the examination, by helping the students understand the aspect of the test that fits the goals of the examination. Also the teacher should be open to make some amendment if the students have constructive ideas to offer. The teacher may also point out salient sections in the course content and other reference sources that will guide the student preparedness for the examination, and where possible past questions and answers may be made available to the students.

How to Improve Marking of Students' Work

The following points are essential for improving the process of marking students' examination, test or assignment:

- Score each question for all students at a time to improve consistency and reliability
- Mark students' scripts in a conducive environment with less distraction
- Avoid scoring when you are tired
- Avoid noting students name and number before marking to avoid being biased
- Score students scripts with an open mind
- Award marks to correct answers that are not captured in the marking scheme

- Be patient with students' handwriting to accommodate poor writers
- Allocate more marks to higher level of learning and less to low level of learning (Cognitive: analysis, application, synthesis, evaluation. Psychomotor: practice, adaptation, innovation).

Types of Marking Scheme

Marking schemes are of different types due to diverse subject areas that have different learning outcomes. In mathematics and engineering for instance, students are expected to give specific answers to specific questions due to the nature of such subjects. Here the marking process is likely to be fully structured or more objective than subjective. Conversely, in humanities and social sciences, students are expected to write essay and may have the privilege of expressing their views in a more theoretical form within the context of the subject area. In line with this, Wood (2004) argued that there are structured, combined and unstructured making schemes.

An **unstructured marking scheme** is type of marking scheme that does not have criteria for marking an assessment and does not provide the assessor or marker the platform for comment on students work. This type of marking scheme is good for marking essay or reflective type of work. The danger of this type of marking scheme is that it leads to 'impressionistic' marking. However, if the marker wishes to comment, the marker may consider a semi-structured scheme which adopts general headings as unstructured scheme but criteria for marking the assessment will clearly be stated out.

A **structured marking scheme** on the other hand, is a type of marking scheme that has criteria to be considered by the marker when marking. In other word, marks are allocated each questions of the examination. Structured marking scheme is best where the question requires a short answer or one word, because marker's note shows the correct answers and how the answers would be obtained. There is need for the marker's note to be consistent both in marking and annotation of students' exercises. Also, the note should to accommodate different markers using the same note for marking the same exercise, in such a way that incorrect answer are annotated with correct response, and a note on the best way to achieve the correct answers. Similarly, the assessor prepares a prototype answers with the correct answers and methodology, to distribute to the examinee when their submissions are returned. Lizz (2012) highlighted two similar types of marking schemes, which are: analytical and holistic.

An **analytical marking scheme** is a type of marking scheme that allocates marks with different criteria for weightings according to its importance. Analytical marking scheme is similar to structured marking scheme, in the sense that available marks are allocated according to the standard criterion reached and at the end of marking the script, the sum of the marks give the total mark or score.

Alternatively, there is a **holistic marking scheme. This** type of marking scheme is similar to unstructured marking scheme as it considers how the criteria for marking contribute to the quality of the whole rather than individual parts. Thus, it does not divide the marks between the criteria. However, both marking systems have advantages and disadvantages and are valid.

Analytical marking scheme can make marking easier when many criteria need to be considered for assessment of long work. Ideally, in a situation where the work is long, it is expected that the assessor examine the work separately against each criterion which may warrant re-reading of the entire work several times. However, we do not employ this practise because it is too time consuming, rather, we assess the work against several criteria at once, and so we may lose the benefit of analytic marking systems.

The use of Analytical systems enhance detailed feedback to the students, as students can easily identify areas they did well and the areas they did not, and the marks gotten from each criteria without the assessor's comment. The major problem associated with analytical systems is that the total marks are less than the individual marks. For example, is using analytic marking scheme to award marks to the quality of writing and referencing. A student may however attempt this work though well written but out of scope. Such student may still have pass mark, because analytic marking scheme still provides pass mark to such student, even when the work is not relevant.

Another typical example is the situation where a student writes all he/she thinks about a particular subject instead of answering the questions asked. The response of the student may contain actually facts that may earn the student marks but illogically presented, and may also contain irrelevancies, which holistically is worth less. Strictly adherence to analytical marking scheme may result much higher marks than what is expected. However, a student who writes far less holistically could be considered to be worth more.

Also the reverse is the case here, when a student produces work of primary sources of excellent quality, but the captured qualities are not present in

prepared marking scheme. In the same vein, some qualities often over lap and cannot be separated into parts for marking. Holistic marking systems on the other hand, avoids the bottleneck associated with analytical marking scheme, since the process of allocating marks is not explicit, and internalised, and as such is seen to be less objective. However, a holistic marking scheme enjoys timing and is often used where valid judgement is required. In summary, fare judgment is required in all markings.

Examples of Marking Schemes

Radio and Television

Question: (a) State the main functions of a radio transmitter and a receiver.

(b) Explain the principles of operation of AM Sound Transmitter with the aid of a diagram

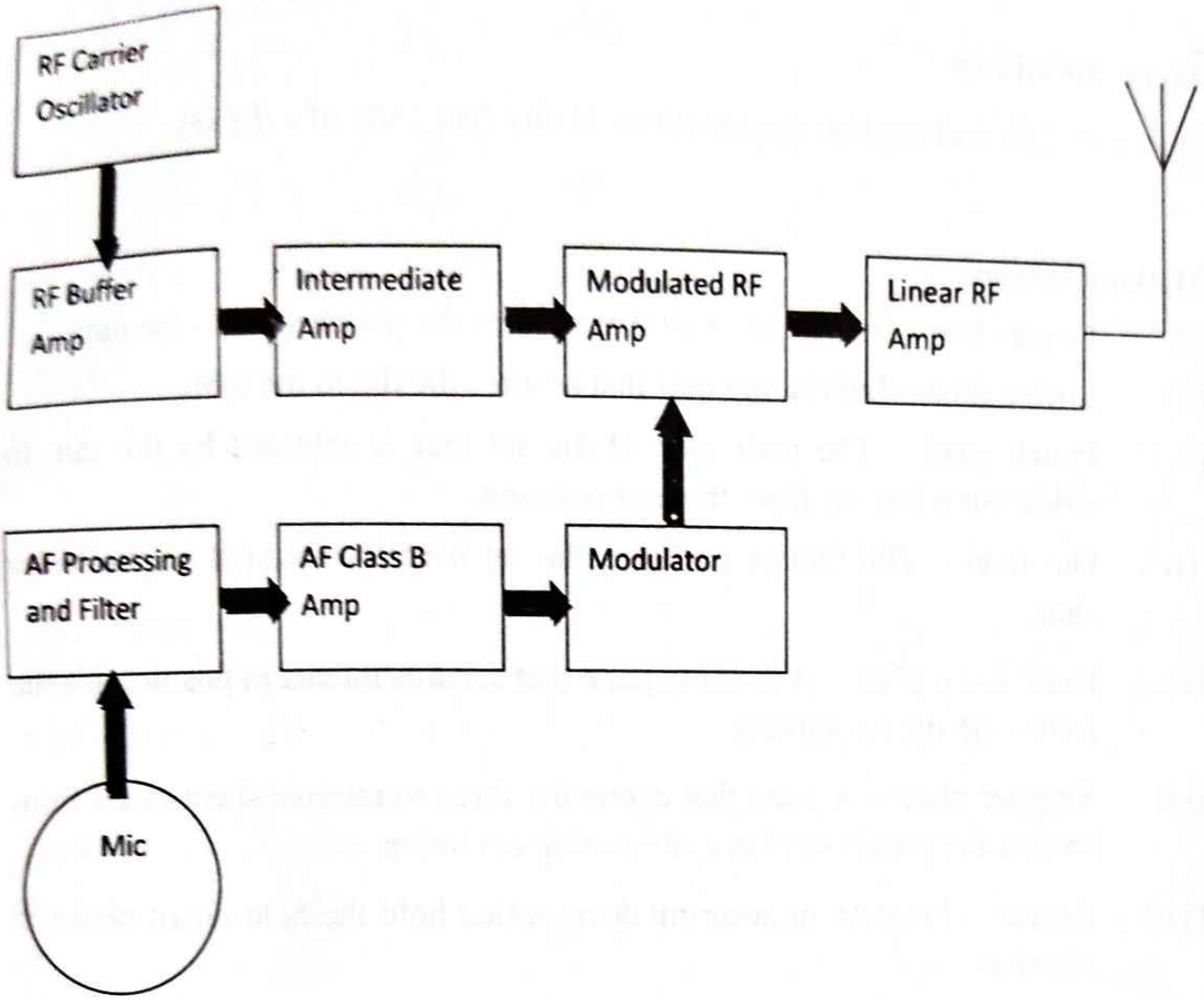
Answer:

(a). The main function of a transmitter in radio communication is to deliver sufficient radio signal through transmitting antenna for radiation. **(2 Marks)**

The main functions of a radio receiver are to (i) select the required radio station (frequency band) out of the numerous modulated carriers reaching the receiving antenna and (ii) convert the selected modulated RF signal into AF signal. **(3 Marks)**

(b). Block diagram of an AM sound transmitter.

Antenna



Block Diagram of AM Sound Transmitter (3 Marks)

The microphone (Mic) converts the pure audio tone into the message signal which is processed and filtered to make it occupy the required bandwidth. The AF power amp boosts the voltage level of the processed message signal. This has to be a linear (Class-B) amp in order not to distort the message signal. The modulator is a Class-B AF output amp that produces enough power for the modulation of the carrier signal. The RF portion of the transmitter starts with the carrier oscillator which provides the required carrier signal frequency. The buffer amplifier is a linear Class-A type that does the pre-amplification of the carrier signal, while the intermediate amp is a non-linear Class-C RF stage that raises the power level high enough for modulation. Modulation of the amplified carrier signal takes place at the modulated RF output amp stage which has to be a Class-C amp. **(7 Marks)**

Total Marks: 2+3+3+7 = 15marks

Metal Stamping

Question: List and explain the functions of any five parts of a die set.

Marking Scheme

(i). Upper shoe – Interfacing part that secures the punch steel to the ram

(ii). Lower shoe – Interfacing part that secures the die to the table

(iii). Punch steel – The male part of die set that is actuated by the ram to either cut a hole or form the part required.

(iv). Die steel – The female part of a die set usually mounted on the lower shoe.

(v). Hold down plate – A holding plate that secures metals in position for the follow-up die operations

(vi). Stripper plate – A plate that exerts the force to remove sheet metal from around the punch steel in a die cutting operation

(vii) Keeper – Position or securing devices that hold the hold-down plates in position.

2marks each for any 5 ..... 10marks

Table of Specifications

Oftentimes, there is non-coherence between the content considered in the class and the material assessed at the end of the unit evaluation. This menace has led to evaluation that fails to provide concrete evidence from which assessor can make valid judgement about students' progress. However, table of specifications is the method teachers can harness to curb this problem. Table of Specification can be defined as a blue print or table that aligns the objectives, instructions assessment, and award of marks. Table of specification is also called test blue print. Also, this method is mostly used for summative test. Thus, adequate sampling of class content should be done at the cognitive level that the material was taught in order to measure the test accurately.

Therefore, the guide to the teacher, that ensure that questions are set from all the topics taught, and are succinctly distributed to assess the six levels of educational objectives is also called Table of Specification. The awarding of

marks to each question should also follow this even distribution. The classifications of educational objectives according to Bloom et al (1971) are namely:

Knowledge

Comprehension

Application

Analysis

Synthesis and

Evaluation

These levels are in hierarchical order, knowledge being the simplest and evaluation is the most advanced. Inyang (2012) suggested some vocabulary words that are associated with each of the levels outlined below:

Knowledge	**Comprehension**	**Application**	**Analysis**	**Synthesis**	**Evaluation**
Define	Compare	Apply	Analyse	Combine	Judge
Select	Distinguish	Solve	Separate	Create	Evaluate
List	Explain	Construct	Resolve	Design	Recognize
Identify	Predict	Charge	Interrelate	Construct	Identify
Name	Translate	Relate	Determine	Suggest	Appraise

Steps for Developing Table of Specifications

- To construct a Table of Specification in a course, for instance magnetism, the following steps suggested may be useful:
- State the subject e.g. Electromagnetism
- State the number of topics or content areas to be tested
- Indicate how many test items will be set in each topic and their marks
- Assign items and marks to each cell
- Importance or weighting (marks) attached to each topic depends on the amount of content or difficulty in it.

How to Develop the Table of Specification

Table of Specification is a 2-dimensional table designed to guide the teacher in the distribution of examination questions and marks. At one side of the table are content areas, covered in the class. At the other side of the table are the six levels of cognitive domain. The small boxes or squares of the table are for the teacher to indicate the number of items to be drawn and marks (in bracket) awarded to each. See the illustration in Table 7.1:

Table 7.1: Table of Specification on Magnetism

CONTENT AREA	KNOW.	UNDER.	APPL.	ANAL.	SYNTH.	EVAL.	TOTAL
	ITEMS/MARKS	ITEMS/ MARKS	ITEMS/ MARKS	ITEMS/ MARKS	ITEMS/ MARKS	ITEMS/ MARKS	ITEMS/MARKS
MAGNETISM	3 (3)	2 (2)	1 (1)	1 (1)	3 (3)	1 (1)	11 (11)
LINES OF FORCE	2 (2)	2 (2)	2 (2)	1 (1)	2 (2)	2 (2)	11 (11)
MAG. FIELD	3 (3)	1 (1)	3 (3)	2 (2)	1 (1)	1 (1)	11 (11)
MAG. FLUX	3 (3)	2 (2)	1 (1)	2 (2)	1 (1)	1 (1)	10 (10)
TOTAL	11 (11)	7 (7)	7 (7)	6 (6)	7 (7)	5 (5)	43 (43)

Exercises

1. What is marking scheme?
2. Outline four importance of making scheme to the teacher
3. Does marking scheme help students? Explain
4. List and explain three steps in preparing a making scheme
5. How do you improve the process of marking students' examination?
6. What are the differences between holistic and analytical marking schemes?
7. List the steps in developing a Table of Specification
8. Outline the six levels of cognitive domain as employed in preparing a Table of Specification

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