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The Challenges of Using Lesson Plan Formats for Effective Teaching of Chemistry in Kisii District, Kenya

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Abstract
The study sought to review the state of the use of lesson plans by teachers in teaching Chemistry in six secondary schools of Mosocho Division of Kisii District, namely Cardinal Otunga, Mosocho Academy, Raganga, Kioge, Nyatieko and Nyabururu. The research tool used was the questionnaire. The respondents included the head teachers, the heads of the Science departments and Chemistry teachers and, therefore, three types of questionnaires were administered. The Chemistry teachers' questionnaire sought information regarding the problems that teachers faced in preparing and using the lesson plans. The heads of science department's questionnaire solicited for information regarding problems they faced in trying to see that teachers prepared and used the lesson plan, if Chemistry teachers in one school used more than one lesson plan format and the format that was found easier to use. The head teachers' questionnaire was used to collect information on how they carried out their duty of seeing that teachers prepared and used the lesson plan in teaching chemistry. The head teachers also made comments concerning the use of the lesson plan in teaching chemistry. From the findings of the study, it was noted that most teachers used the columnar format and understood the importance of the lesson plan. However, some were completely unable to use the lesson plan. This shows that there is need to employ qualified teachers. The study contributes useful knowledge to scholars and other education stakeholders that may help in improving teachers' effectiveness in their teaching of Chemistry among other science subjects.

Keywords: Using Lesson Plan Formats, Effective Teaching, Chemistry, Kisii District, Kenya.

INTRODUCTION

The Position and Utility of Chemistry in the School Curriculum

Since living in the present world invariably warrants, to a variable degree, knowledge of scientific facts and theories, it is essential to include Chemistry in the school curriculum for two major reasons: mankind needs the service of chemists in large numbers if any reasonable standard of living is to be achieved and maintained by the members, the larger and more important issue is the part that chemistry can have on the production of educated citizens - a community that is sensitive to the possible effects of the activities of the scientists and technologies on its welfare both now and in the future (Wachanga, 1991).

Components of the Lesson Plan

A lesson plan acts as a road map for a class session. It identifies the destination (objective of the lesson) and marks out the route (activities for each stage of the lesson). It is an aid for both new and seasoned teachers. New teachers should write down the details of each activity, perhaps even script them (Arlington Education and Employment Programme, 1994). Experience will guide how detailed a lesson plan needs to be. Sharing the plan with learners (e.g., writing the objective and a brief description of activities on the board) keeps both the teacher and the learner focused on where they are going, how they are going to get there and when they arrive (ibid.).

The perfect lesson plan, according to Lewis (n.d.), includes 8 parts as shown below:

Objectives and Goals: The lesson's objectives must be clearly defined and in lined with district and/or state educational standards.

Anticipatory Set: Before you dig into the meat of your lesson's instruction, set the stage for your students by tapping into their prior knowledge and giving the objectives a context.

Direct Instruction: When writing your lesson plan, this is the section where you explicitly delineate how you will present the lesson's concepts to your students.
Guided Practice: Under your supervision, the students are given a chance to practice and apply the skills you taught them through direct instruction.
Closure: In the Closure section, outline how you will wrap up the lesson by giving the lesson concepts further meaning for your students.
Independent Practice: Through homework assignments or other independent assignments, your students will demonstrate whether or not they absorbed the lesson's learning goals.
Required Materials: Here, you determine what supplies are required to help your students achieve the stated lesson objectives.
Assessment and Follow-Up: The lesson doesn't end after your students complete a worksheet. The assessment section is one of the most important parts of all.

There are two formats of lesson plan presentation:
Columnar - This is the most common format and uses columns to indicate the various components.
Prescriptive - Sub-headings are used to indicate the essentials of the lesson plan.
Both formats contain the following essential components a teacher should consider while planning:
Topic: Major Topic;
Subtopic: Lesson Plan
Lesson objectives which refer to the description of what the leaner will be able to do in the end of Instruction.
Content/subject matter: This is a brief description of what is to be covered during the lesson.
Method: The activities that the learners and the teachers do to achieve the objectives
Teaching/learning aids: These are items that will facilitate the teaching-learning process.
References: Refer to the list of books or journals that have been used and specified pages
Remarks: These are statements of indicating or finding out whether the objectives have been achieved or not, or a statement of how learning has been evaluated. It usually forms part of the conclusion.
Time: This refers to duration the lesson plan and conclusion among other elements.
Assignment: This refers to the focus given in the course of instruction, i.e oral, practical, or written.

Preparing a Lesson Plan
The following is a rough scheme for a lesson plan as proposed by Mbalacha (as cited in StudentHandouts.com, n.d.):
Heading/General Information that includes: Teacher's name; Course name; Lesson number, topic and page numbers; Time allotment; Grade Level
Materials and Media (needed by teacher & students) that includes: Handouts; copies of PowerPoint presentations etc. (No need to include equipment that is normally in classroom)
Instructional Objectives: Unit goals/long-range objectives (separate page at beginning of unit plan); Lesson objectives; Behavioural expectations (The student will . . .). N/B: Be sure objectives are measurable/specific
Instructional Procedures Set (attention getter/introduction, be creative!): Labels learning; Involves students; Relates to real life; Relates to prior knowledge
Instructional Procedures: Things you will do to teach material; Things students will do to reach objectives; Good idea to number these and leave a blank line before next number
Closure (question/answer, etc.): Should seek student input; Two parts, i.e. verbalization and performance (both by student)
Independent Practice/Assignments (for students): Exercises/projects students will work on during the fifty-minute class period; homework to complete outside of class/things to study before next class
Assessment/Checks for Understanding: Formal or informal, quiz/test, question/answer etc
Reflection/Self-Evaluation/Notes (added after teaching lesson): What worked and what didn't; what you would do differently?

Das (1992) argues that a lesson should be planned immediately after the preceding lesson because the previous lesson is fresh in the mind of the teacher. The extent of the lesson covered and approach followed is distinct in his mind. It is also possible to remember the mistakes he committed so that planning the next lesson he can use his experience. He can also foresee the type of activity that will create interest and enthusiasm in his pupils. According to Das (1992), lesson planning usually involves the following steps:

Statement of Objectives
The objective of teaching the particular topic of Chemistry should, first of all, be stated in clear unambiguous words. The whole structure and approach of the lesson plan will depend on the objectives desired to be attained. Aims are too general and are directly related to general aims of education. This should be remembered by

the teacher rather than stating them when planning for teaching the teacher is also involved in the formation of lesson objectives from the aims. This will give the teacher-direction of teaching.

Apparatus and Teaching Aids

The apparatus and other teaching aids needed in connection with the lesson should be mentioned. A study of the content and method will enable the teacher to decide on the materials needed. He will, however, have to consider the available resources and facilities. The selection of apparatus for a demonstration or laboratory work and related teaching materials or reference charts, diagrams, models, films or film strips, will depend upon their availability.

Introduction and Motivation

Before giving the lesson the teacher needs to know the pupils' previous knowledge. This is to know the background of the class thus to prepare ground for the class to understand the new lesson, obtaining the students' precious knowledge should be motivating to the student. There may be various ways of introducing the lesson. It may be introduced through an interesting demonstration or telling a story, the discovery of the particular facts or principles or the biography of scientist connected with it. Appropriate questions may be led to realize the necessity of learning the new topic the teacher is about to present. Arriving at this stage the teacher should announce the day's lesson. After introducing the lesson the next stage is presentation.

Presentation

This is the stage of actual giving of lesson, the time for the teacher to show his ability in selecting, organizing and presenting the content matter, engage himself in appropriate activities such as demonstrating, talking, questioning, supervising, giving blackboard summary or simultaneously evaluating and also providing activities to the pupils such as observing, taking notes of salient feature, helping in demonstrations, doing individual or group practical work. The pupils should be kept busy with one or the other type of activity. During teaching the teacher should encourage the pupils to observe carefully, compare and contrast with similar events and lead them to generalize the principle taught in class. Comparison of the present features with similar other facts and principles is essential in any type of scientific earning. The arrival at a generalization by the pupils may not always be completely correct yet it helps to attain the broader objective to teach the particular topic in Chemistry.

Application

In this stage, the application of new learning to life situation is discussed. The pupils should be able to see the application of principles or the phenomena in their everyday 1ife and also be familiar with their app1ications. They should be able to apply their knowledge of facts and principles to new situations. They may be asked to solve problems which involve the application of the facts or principles taught in class. Questions may be asked to test their knowledge or creative exercises may also be given to test their knowledge. This stage may also be used for the purpose of revision or recapitulation. Milkova (2010) proposes three questions, as showed in Figure 1, be answered:

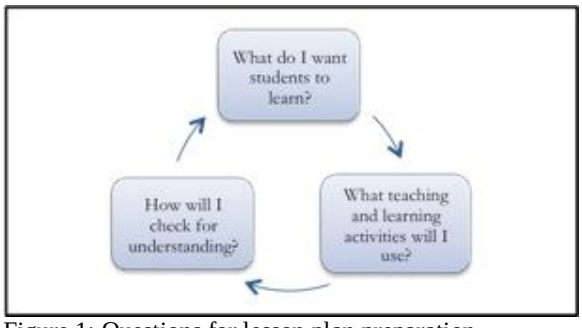

Figure 1: Questions for lesson plan preparation

According to Milkova (2010), lesson plan is the instructor's road map of what students need to learn and how it will be done effectively during the class time. A successful lesson plan addresses and integrates these three key components (ibid.):

- Objectives for student learning
- Teaching/learning activities
- Strategies to check student understanding

To be effective, the lesson plan does not have to be an exhaustive document that describes each and every possible classroom scenario nor does it have to anticipate each and every student's response or question. Instead, it should provide you with a general outline of your teaching goals, learning objectives and means to accomplish them (Milkova, 2010). It is a reminder of what you want to do and how you want to do it. A productive lesson is not one

in which everything goes exactly as planned, but one in which both students and instructor learn from each other (ibid.).

The Need for Lesson Plans in Chemistry Instruction

The KCSE results in the last few years indicate a rather unsatisfactory performance by school the science subjects. The 1989 KCSE was the first examination in the secondary cycle of the 8.4.4 system of education. From the 1989 KCSE Examination report (KNEC, 1991), it is noted that:

Good performance was noted in Kiswahi1i, History and Government, Christian religious education, Agriculture, Technical subjects, German and Arabic. Considerable effort was, however, required towards improvement of physical sciences, Maths, Drawing and Design, Economics, English, Biology, Commerce and Music (p. 1).

This trend has continued up to the present. Therefore, planning for classroom teaching is a major prerequisite for successful teaching. One of the most essential documents used for planning for classroom teaching is the lesson plan. Teachers are not the only ones to benefit greatly from effective lesson planning. Research indicates that all students benefit from, and appreciate, well-structured lessons. (Kizlik, 2010).

LIMITATION OF THE STUDY

The study was conducted in a single district in Kenya, hence the findings may not be generalised to the whole country. However, given the uniform nature of Kenya's system of education, contextual factors of socio-economic and political nature notwithstanding, the study provides a framework on which the field experiences of teachers in various schools can be analysed to understand the challenges they go through in their implementation of the Sciences syllabus for secondary schools in the country.

MATERIALS AND METHODS

This study was conducted in six secondary schools in Mosocho Division of Kisii District. The author carried out random sampling to obtain one division in Kisii District and then carried out purposive sampling of all the teachers involved in teaching secondary school chemistry, heads of science department and head teachers in the schools in the Division. This gave a total of 30 respondents. Data was collected through the administration of questionnaires which were given to the teachers of Chemistry, heads of science departments and head teachers. After collection of data, the percentages of chemistry teachers who responded to the items were calculated and the information presented in percentages. The heads of science department and heads teachers questionnaire were also analyzed item by item and the results were presented using descriptive statistics.

RESULTS AND DISCUSSION

Teachers' Views on Lesson Plan Preparation

This paper investigated the Chemistry teachers' inability to prepare a lesson p1an. The results showed that the majority (72%) of Chemistry teachers were able to prepare a lesson plan. A few teachers (5.6%) were completely unable to prepare a lesson. This could be due to lack of training.

This study also sought to find if teachers were under terrible strain while making a Chemistry lesson plans. Results showed that less than half (39%) of the chemistry teachers were in terrible strain while making a Chemistry lesson plans. The remaining 61%were not in terrible strain while making a Chemistry lesson plans. To plan effectively, teachers are supposed to be able to plan with ease. The study sought to establish f teachers found the use of the lesson plans necessary. Results showed that 67% of the Chemistry teachers found the use of the lesson plan necessary. This implies that teachers have still got to be enlightened on the necessity of the lesson plan.

Another objective of the study was to investigate if the teachers were aware that the lesson plan very essential in teaching Chemistry. Results showed that the majority (78%) of the chemistry teachers were aware that the lesson plan was very essential in teaching. A few (22%) still needed to be enlightened on the necessity of the lesson plan.

On the general issues associated with lesson plans, 8(44.50%) found it tedious to plan; 3(16.7%) found it restrictive during lessons; 6(33.3%) found it difficult to time their teaching, while 1(5.6%) found no problem using lesson plans. The lesson plans is a very essential document in planning for teaching yet teachers found problems in preparing and using it. As

such, ways of overcoming these problems should be sought.

Challenges Faced by Heads of Science Department

Of the heads of science department, 50% remarked that making of the lesson plan by Chemistry teachers was adequate while 50% remarked that it was not adequate because lesson plans were hardly made. In most cases teachers only made lesson notes. Teachers therefore needed to be reminded from time to time on the necessity of the lesson plan. In addition, 25% of the heads of science department faced problems in trying to see that teacher prepared and used lesson plans. A further 75% did not face any problems. Ways have got to be sought out on how to overcome these problems.

Furthermore, 35% of the heads of science department remarked that the Chemistry teachers used different lesson plan formats while 75% remarked that the chemistry teachers used the same lesson plan formats.

On the issue of format, all the heads of science department remarked it was easier to use the columnar than prescriptive lesson plan. From the findings, it was noted that most teachers used the columnar format and understood the importance of the lesson plan. However, some (5.6%) were completely unable to use the lesson plan. In this case, there is need to employ qualified teachers.

The Views of Head Teachers on Lesson Plans

The results revealed that 16.7% of the head teachers met the head of science department very often to discuss matters pertaining to effective teaching. In addition, 66.6% met them often while 16.67% hardly met them. It is recommended that the head teachers meet head of department often to discuss matters pertaining to effective teaching. In general, 83.3% of the head teachers commented that the lesson plan was very vital/essential in that it reminds the teacher of the areas uncovered. It also guides the teacher, saves time and directs the teacher in achieving the intended objectives. However, 16.7% did not give any comments. From these results it appears most head teachers take lesson planning seriously.

CONCLUSIONS

This study focused on the use of the lesson plan by chemistry teachers in secondary schools in Mosocho Division of Kisii District. The problems teachers faced in preparing and using the lesson plan and the procedures that could be followed for the improvement and effective use of the lesson plan have been discussed in this paper. The following conclusions were drawn from the study's findings:

Most teachers of Chemistry face problems in preparing and using the lesson plan yet the lesson plan is of great value. Therefore, there is great need to see that these problems are overcome. Few teachers did not know the values of lesson plan. Most heads of science department neglected their duties of seeing that teachers plan effectively for teaching and needed to be reminded.

RECOMMENDATIONS

More research is needed to determine the effect of planning for teaching on the efficiency of learners. More research is needed to determine why the work done by the heads of science department in some schools is not adequate. Besides, lack of training in administration, probably these positions may not have been given to those who hold them on merit.

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