

Quality of Planning and Objective Setting by Teachers of Organic Chemistry in Kenya

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Abstract

The Chemistry taught in Kenyan secondary schools can be grouped into general, physical, inorganic, industrial and organic chemistry; most topics being in the general, physical and inorganic areas. However, organic chemistry is not well understood by students at this level. With the big potential for organic chemistry industry, Kenya needs organic chemists who can bring innovation and development. However, the Kenya Certificate of Secondary Examination reports indicate that the performance in this section is generally poor. The study examined the quality of planning and objective setting by secondary school chemistry teachers and the effectiveness of these in the learning of organic chemistry by Kenyan students. The study was conducted in randomly selected secondary schools in three districts: two in Rift Valley Province and one in Western province. Two hundred and six students were randomly selected from the schools under study and used in the investigation. The research instruments used were three sets of questionnaires for teachers and students. Quantitative data analysis involving the use of percentages, means and modes was used. Among the conclusions made was that chemistry teachers do not make lesson plans for teaching. The findings revealed that poor planning and lack of objective setting of this subject is one of the main causes of the 'poor' performance. In view of the findings, one of the recommendations is that subject heads, heads of schools and quality assurance officers should insist on the use of lesson plans by teachers for every lesson they teach. One significance of the study is that the research provide useful information which chemistry teachers can put to immediate use to improve their pedagogical skills.

Keywords: quality, planning, teachers, organic chemistry, secondary schools, rift valley, western provinces.

INTRODUCTION

The Kenyan secondary school chemistry syllabus is currently examined in three papers: Paper IA, Paper IB and Paper II. Papers IA and IB are theory papers with paper IA being objective type covering the whole syllabus while paper IB has structured questions covering some parts of the syllabus. Paper II is a practical paper. However, it is in the theory papers that weaknesses in organic chemistry are mostly observed. The problem therefore was that students were performing poorly in the organic section of chemistry. Although the Kenya National Examination Council report (2000) mentioned a number of reasons for the poor performance, an earlier survey by the author indicated that poor teaching was one of the main causes of poor performance. This paper therefore focuses on one possible problem, that of prior planning and objective setting before teaching. The paper confines itself to overt activities of the teacher prior, to instruction in a bid to achieve the pre-determined objectives. The importance of the study to scholars and readers is that it comes up with innovations in the teaching process, hence widening their (readers) knowledge base. Specifically, the following areas were investigated: lesson planning and objective writing. One limitation with the study was that not all responses from teachers and students could have been sincere.

Preparing for Teaching

Teaching requires thorough preparation for it to be effective. Rosenshine *et al.* (2007), in their work: *Preparing For Teaching*, point out that planning is the best antidote for the nerves that many people feel when teaching a subject for the first time or meeting a new group of students. It is also the only way to ensure that your educational objectives are achieved. In their view, and of many educators as well, planning begins with thinking about how you would like your students to approach their learning in your subject, what you would like them to understand, know or be able to do by the end of the course. The effects of the teaching and assessment on student's learning should also be considered while planning. This thinking stage is what Rosenshine *et al.* (*ibid.*) describes as preparation stage one. Preparation stage two is the equivalent of writing schemes of work while stage three is the preparation of the lesson plan. The activities that take place in each of the three stages are as discussed below.

AIMS AND OBJECTIVES

The very first thing to consider when planning a learning experience is what exactly you intend your students to learn. Teaching and learning activities, content creation and assessment all stem from these

initial ideas. Other issues for consideration, according to Monteque (2008), would include:

- Consider what the overall objectives for the subject are
- Consider how the subject's objectives fit into the overall educational aims and goals
- What the aims mean in terms of what you expect students to achieve in the subject and the level of achievement
- The learning, teaching and assessment activities that will help students to achieve the subject aims

Student Learning

An approach that the teacher would like students to take in their learning of the subject should be considered (the way in which you intend students to learn will, in many respects, dictate how you teach). On the other hand, Monteque (ibid.) have useful ideas about what the teachers should think about before they start writing schemes of work; in some cases, well thought out ideas do not always result in the expected outcomes. Cases are known where the behaviour exhibited is contrary to the expectations of the planner. That means the thinking stage cannot be relied upon completely.

Context

In terms of the context in which the teacher thinks about the subject he is going to teach, Tsuma (1998) supports Monteque (ibid.) in the type of considerations to be made about the subject. Similar views are expressed by Weller (1975), who points out that a school subject should be seen as a component of the system and should not be learnt in isolation from other systems. He is in agreement with Tsuma (1998) and Monteque (ibid.) in proposing a number of issues that the teacher should think in relation to the context in which the subject should be taught. These include:

- If the subject has been offered before, he/she could seek feed-back from staff who have been involved and look at archived materials relating to the subject if possible. Use the previous subject evaluations and any recommendations from an analysis of this evaluation if they are available, e.g. by contacting the Head of department to ask about subject feedback surveys.
- The needs of the subject may have been debated in an Education conference, workshop/seminar or in course accreditation reviews. If possible, the teacher could attend any of the sessions involved in debating the strengths and weaknesses about subjects and courses. Often, much of the context is verbal and may not be recorded in official reports.

Although the above ideas could look useful, and it is necessary for teachers to think about them before embarking on planning to teach, there is hardly any

documentary evidence to show that teachers consider the issues stated above in their area of work. The issues, therefore, could be finding their expression theoretically in books and papers but hardly find their way to be practiced by teachers.

Content

In the Kenyan case, the content to be taught to students is contained in a document called the syllabus that is produced by the Kenya Institute of Education. Oketch and Asiachi (1992) point out that the classroom teacher has no choice but to follow the information given in the syllabus. Hence, in preparing to teach this content, the teacher, according to Oketch and Asiachi (1992) and supported by Monteque (2008), should:

- Read the official syllabus description of the subject
- After knowing enough about the general area of the subject and the context within which it fits, select the broad content areas which the subject is to cover. He/she needs to ensure that the subject fits the syllabus description and approved subject content areas but there may also be considerable flexibility about specific topics and approaches.

But this psychological preparedness assumes that the teacher has a positive attitude towards the curriculum. In a number of cases, people are reluctant to adopt to new policies particularly if it is a new curriculum. This could affect its implementation. Hawes (1979) says that there is little doubt that, in most countries, a good deal more could be done to get people talking and thinking about the proposed changes.

Organization

The material should be organized in such a way that the teacher is able to:

- Select, from the content of the subject which he/she would have already selected from the general area of the subject, the material that could be covered in formal class contact time and appraise the remaining content with respect to how students will be expected/required to learn it. Other than formal class time, students can do the other work during project time.
- Consider the possibility of team teaching so that at least one other teacher is aware of the planning issues and the content of the subject. This may be important sometimes when he/she is unable to continue to teach and someone else may have to take over the subject with minimal disruption to student learning.

Teaching Approach

According to Vaidya (1989), a teaching approach could mean a method of delivering knowledge and transmitting of scientific skills by a teacher to his students. A given method, which to one teacher may

be of great value, may lose much value in the hands of another teacher, especially if that teacher believes that a different method is better. Teachers use a variety of approaches. Zvrew (1967) considers that knowledge and skills are the basis of classification of methods of teaching. Zvrew (ibid.) lists some of the issues which have received support from Maundu *et al.* (2005) who suggest the issues that the teacher could think about while deciding the approaches to use in teaching a particular topic.

The issues include:

- Finding out how such subjects as his/hers have been dealt with in secondary education: how topics are treated, discussed, explained, taught and negotiated by others
- Working through, in the teachers' imagination, different ways in which he/she could teach the essential material selected from the syllabus, such methods could include lecture, discussion, problem-solving, demonstration, roleplay or simulations, debates and self-managed learning materials.

Assessment

Examinations and assessment form an integral part of the educational process as a whole. Kempa (1990) points out that assessments are used for a variety of diverse purposes ranging from educational ones like measuring the students' attainment at the end of the course to societal roles like the maintenance of educational standards. The teaching process is incomplete without thoughts and plans on how assessment will be done. Some of the guidelines as proposed by Kempa (ibid.) and supported by Montequ (2008) that could help the teacher come up with effective assessments are:

- The teacher thinking about the person(s) that will make decisions about the types of assessment and assessment weighing: will it be the teacher, the students or the examinations officer?
- Considering how the teaching and assessment approaches might affect students' learning approaches and outcomes. The teacher should try to plan assessment items that will allow students to show their understanding of the subject rather than how many facts they can remember.
- Planning ways of providing regular, meaningful feedback to students
- Considering using peer or self-assessment processes to encourage students to become critical of their own work
- Considering the approaches students might take to the proposed assessment tasks. Does the assessment encourage students to understand, extend their learning or relate the subject to real-world situations?
- Preparing a detailed statement of assessment procedures for example timing, type of

assessment, criteria for assessment, marking scheme and relation of assessments to objectives

Although Kempa (1990) and others have useful guidelines, there is hardly any document from them that gives examples to teachers on how to implement each of the guidelines. A chemistry teacher, for example, needs to see how the relating of assessment to objectives can be done in the specific topic or concept he/she is teaching. Without examples, teachers might read the guidelines but find the implementation difficult.

Resources

As far as resources are concerned, the teacher's preliminary ideas would include:

- Deciding upon or ordering textbook(s), copies of articles handouts, preparing chats, models etc which will be required
- Deciding whether he/she will use laboratory materials

Evaluation

Teachers need to evaluate their work. They should plan to evaluate their teaching and the subject regularly. Regular evaluation will enable the teacher to improve the quality of the course and his/her teaching. This can be done by keeping a journal of activities and changes he/she would like to make and the reasons for them. The evaluation could be done by having other teachers sit-in during some classes or by asking students what they have understood to be most important in each session or by having a focus group of students discuss important teaching and learning issues and by using the student feedback survey system. If the teacher writes down the points raised on the issues in preparation stage one as he/she thinks about them, then the work to be done in other preparation stages would be easier for him/her. Many teacher training institutions encourage their trainees to write remarks or self evaluation after every lesson. This is an attempt at teacher evaluation.

Preparation: Stage Two

Many educators believe planning results in better teaching. The previous stage dealt with how a teacher could reflect on what he/she intends to teach. It is expected that after the reflections, the teacher writes an organized plan of these intentions. This is what Briggs (1977) views as the second stage of a teacher preparing to teach. As Twoli (2006) puts it, "For most teachers, serious preparation for instruction in a classroom starts by writing a scheme of work (SOW)" (p.140). While writing the SOW, the teacher should keep well ahead of the students, preferably finishing preparation before the term or year begins.

Young (1979) says that the considerations to be made while writing a scheme of work can be put into three categories: student learning, organization detail and

teaching detail. This is supported by Monteque (2008) who suggests the kind of information that should be considered in each of the categories. For student learning, the considerations will focus on how the students are expected to learn and will include:

- Beginning to consider in detail how the essential content can be learnt by the students
- Thinking about common student misconceptions in the subject and how these might best be overcome
- Deciding what the key problems, concepts, questions and developments are
- Dividing the essential subject matter into teaching sessions with objectives for each: what should students know, understand or be able to do after each?
- Checking the earlier decision about which material is to be covered in class and which is to be covered by students themselves in other ways, and making any modifications which seem desirable

However, Young (1979) adds that no matter how careful the teachers' plans are, they need to be aware that students often find it much more difficult to understand ideas that teachers expect, which mean their (teachers') plans might not achieve the desired outcomes.

Organizing The Work

In terms of organization, Mager (1968) raises a number of points that a teacher could use to guide him/her to ensure the scheme is well prepared. Among them are:

- Checking the structure and sequence of what the teacher will teach. Allow possibilities for flexibility and student choice
- Preparing sessions one by one, selecting material for each: main points, examples/illustrations, students activities, references and teaching resources
- Deciding on the teaching approaches for each topic: lecture presentation, discussion, small group work, individual students' activities, practical sessions and independent learning class
- Deciding on assessment methods

Teaching Arrangements

After preparing schemes of work, Vaidya (1989) adds that the teacher should prepare materials for teaching such as:

- Compiling any lecture notes such as introductory remarks, outline of the session(s), connection to last session, connections with other parallel segments such as laboratory classes, main points and sub-points, concepts, questions, examples, illustrations, student activities, summary, questions for further consideration and reading necessary or desirable

- Selecting audio-visual resources and making necessary orders or bookings
- Preparing handouts, reading lists, problem sheets, study guides and laboratory manuals. Handouts may contain: session objectives, outline of the session, definitions, references, diagrams, questions to be covered, space for student notes and group discussion of problems. Reading lists may contain prescribed texts, recommended reading with full bibliographical details, selected chapters from books, articles and web links for further reading.
- Preparing detailed advice as to how subject content not dealt with during teaching sessions, such as projects, can be learnt by students

As observed, Mager (1968), Young (1979), Vaidya (1989) and Twoli (2006) all agree that preparing schemes of work should be the work of teachers. When teachers prepare schemes of work, they reflect in depth the work they are going to present to their students. They own the ideas and plans. What the above scholars might not know is that, at times, the practice on the ground is contrary to their (scholars') expectations. There are cases in Kenya where schemes of work are provided to teachers by curriculum developers such as the Kenya institute of education. When this happens, teachers are not part of the planning process; they might not be confident and effective in implementing the curriculum. Educators such as those mentioned above need to come up with alternative ways of making the teacher 'own' the instruction programme even if he/she would not have been involved in planning and preparing schemes of work. However, the idea of curriculum developers preparing schemes of work for teachers does not help the teacher to practice his/her professional skills and should be discouraged.

Kafu (2003) points out that teachers make lesson plans from schemes of work. The lesson plan is an outline of activities that a teacher uses while presenting a lesson. Mukwa and Too (2002) add that the preparation of the lesson plan involves a lot of mapping out of strategies, methods and resources needed to be present in a lesson within a given situation, class level and time. But even after preparing it, a teacher needs to reflect on how the actual teaching is going to be done.

MATERIALS AND METHODS

The study was carried out in three districts: Keiyo and Uasin Gishu district of Rift Valley Province and Kakamega district in Western Province. This study used a descriptive survey research design focusing on the current classroom procedures. The procedures for the analysis, classification and interpretation of data were descriptive as well. The target population consisted of 21 secondary schools randomly selected from three districts: Keiyo, Uasin Gishu and

Kakamega. From each school, a random selection of students was done giving a total of 206 students that were used as respondents. All the students used were form fours who had just done their final chemistry examination papers. In addition to the students, 24 teachers coming from 18 of the secondary schools used in the study were used. Teachers from three schools, namely Tambach High School, St. Peter’s Seminary and Chebisaas High School, declined to respond to the questionnaire. Four schools presented more than one teacher to respond. The teachers used were those that taught the form four classes that had just done the Chemistry examination.

To select the schools, a random sampling technique was used. The researcher obtained data through use of three instruments namely the students’ questionnaire, the teachers’ questionnaire and the questionnaire for heads of science departments. To analyse data, two general approaches were used: the quantitative approach and qualitative approach. The quantitative approach involved the use of descriptive statistics to analyse data in four basic techniques involving frequencies, means, percentages and distribution curves. The qualitative approach was mostly used for data obtained from open-ended questions. The responses were collected and classified into certain patterns. Inferences from the responses were then made based on the patterns that emerged.

RESULTS

Objective Setting Item Analysis

There was a set of questionnaires that had items that would reveal the quality of objective-setting done by teachers. Table 1 below shows the responses. The analysis and interpretation of the data is as follows: Responding to the questionnaire, (4.17%) of the teachers said that in writing objectives in the schemes of work, they are guided by the topic. Two (8.34%) of the teachers said that they are guided by the level of learners. The teachers who said that they are guided by the objectives in the syllabus book were (41.67%) while (45.83%) of the teachers said they are guided by the expected new knowledge and skills in writing objectives in the schemes of work.

It is observed that less than half (41.67%) of the teachers use the syllabus book closely in writing objectives in the schemes of work. This is rather low given that teachers are expected to implement whatever is in the syllabus. The responses revealed that most teachers, (83.33%), agreed that both the knowledge and skills to be attained should be emphasized while stating objectives.

In describing students’ activities, (41.67%) teachers said they were guided by the objectives to be achieved by students. The relationship between what the students should do in class and the objectives to

be achieved do not seem to be strongly embraced. Thus over half of the teachers do not use objectives in designing class activities. On whether or not teachers find it necessary to write objectives for every lesson they teach, (16.67%) teachers said they did not find it necessary with another seven teachers saying that, at times or when the need arises, giving a total of teachers who do not find it necessary to write objectives for every lesson they teach to be (45.83%). This is the percentage of teachers who go to class without any written objectives guiding them on what the learners should achieve in the course of the lesson. Without proper guidelines, teaching could be haphazard with some important points left out.

The study also required teachers to state what they emphasize while writing objectives: 15(62.50%) of them said they emphasized both knowledge and skills to be achieved. However, (37.50%) of the teachers did not seem to be familiar with the way chemistry objectives should be written and said they emphasized attitudes or skills.

In providing information on objective-setting, (75%) of heads of departments said teachers did not write objectives for every lesson they teach. There was some correlation between 45.83% teachers who did not find it necessary to write objectives and 75% of heads of departments who agreed that teachers do not write objectives in every lesson they teach.

Table 1: Quality of Objective Setting done by Teachers

Questionnaire Item No.	Type of Respondents	Answer Choice				
		A	B	C	D	Total
6	Teachers	1	2	10	11	24
8	Teachers	1	2	20	1	24
9	Teachers	1	11	2	10	24
19	Teachers	4	13	4	3	24
20	Teachers	4	3	2	15	24

Quality of Planning done by Teachers Responses from the Teachers

The teachers responded to questionnaire items that provided information on the way teachers planned their work, as provided in Table 2 below.

Table 2: The Way Teachers Plan their Work

Question No.	Answer Choices				
	A	B	C	D	Total
13	9	11	0	4	24
14	18	2	2	2	24
16	7	4	12	1	24
17	5	11	7	1	24
18	1	4	8	11	24

The responses show that only (37.50%) of the teachers made self criticism or evaluated the lessons they had taught at the end of every lesson. The remainder of the teachers, (62.50%), made an evaluation at the end of the topic or never do so. Teachers who make evaluations at the end of the

topic are unlikely to remember all the fine strengths and weaknesses that occurred during each lesson and so such evaluations will not help him/her plan future lessons better.

Indicating where they write the evaluations, (75%) of the teachers said they recorded it in the record of work covered books. A sample observation of what was recorded in these books showed that teachers merely write "covered" for the topics they have taught; hence a record of critical evaluation of the lessons as they were presented is not done.

As to whether or not teachers found lesson plans necessary for their teaching as indicated in questionnaire item number 16 of TQS, (29.17%) of teachers said 'yes'. Lesson planning forms a core topic in teacher preparation in teacher training institutions and so it is surprising to find that a substantial number (70.83%) of the teachers do not find them necessary in their teaching. The responses showed that only (20.83%) of the teachers made lesson plans for every lesson. That is, 79.17% of the teachers did not make lesson plans. The major reasons that teachers gave for not making lesson plans were:

- They require a lot of time, responded by 45.83% of teachers
- Notes made by the teachers are quite sufficient, responded to by 33.33% of the teachers
- Lesson planning is done in colleges/universities for training purposes only was the response given by 21% of the teachers

Heads of Departments

Responses from heads of departments showed that 8 (40%) of the heads of department said individual teachers possess syllabus books. The rest, 12 (60%) of the heads of department, said that the syllabus books were kept by the head of department (HOD) or were in the principal's office. The interpretation from these responses is that teachers do not have easy access to the syllabus book. Availability of the syllabus to the teacher enables him/her keep abreast with the syllabus in his/her day-to-day preparation of the lessons.

As far as schemes of work are concerned, (75%) of the HODs said they made schemes termly, with (25%) of the HODs saying that they made them yearly. The responses also showed that; (55%) of the HODs agreed that teachers do not write evaluations of lessons in the scheme of work.

As to whether or not teachers in their departments made lesson plans, (90%) of the heads of department said that they did not make lesson plans. This compares quite well with 79.17% of the teachers who

had said earlier that they do not make lesson plans. The same percentage (90%) of heads of department said teachers use lesson notes (notes made by teachers) for teaching. It should be noted that lesson notes do not contain vital information like objectives of the lesson, method of teaching, resource materials, various student/teacher activities and so on. Thus, it is interpreted that both heads of department and teachers agree that lesson plans are not made for the teaching of chemistry lessons.

While giving reasons for not making lesson plans, 60% of heads of department gave lack of time as a reason, 30% of them said that lesson notes were sufficient enough to replace lesson plans while 10% of the heads of departments said lesson plans were only meant for teaching practice, that is, used only during training of teachers in teacher training institutions.

DISCUSSION

This section of study dealing with writing of objectives was based on the assumption that since most chemistry teachers in schools were trained (89% from the sample of study), they should be able to write clear, observable and measurable objectives which would guide them in their teaching. The objectives should be written before teachers present their lessons. It is also expected that teachers extract the lesson objectives from their schemes of work.

The findings from the study showed that most teachers (83.33%) were aware that objectives should measure both the knowledge and skills to be achieved by learners. Less than half (41.67%) of the teachers used the syllabus closely while writing objectives in the schemes of work. Information from the study also revealed that most teachers do not have quick access to the syllabus. The syllabus books are mostly kept either by the head of department or heads of schools. Furthermore, the data showed that over half (58.33%) of the teachers are not guided by any written objectives while designing class activities. In addition, close to half (45.83%) of the teachers do not actually find it necessary to write objectives for the lessons they are going to teach. This was supported by 75% of the heads of departments who were emphatic in saying that teachers did not write objectives for the lessons they taught.

The fact that teachers are aware of the need to have objectives but do not write them for their lessons is a matter of having the knowledge but not applying it. However, lack of written objectives to guide a teacher in his class activities can affect many aspects of the lesson including the orderliness of presentation, the appropriateness of student activities, suitability of assessments and so on. In effect, the overall purpose of the lesson may be lost.

The accessibility of the syllabi or syllabus book to teachers was also found wanting. The likely effect of teachers not having the syllabus with them is to teach outside the syllabus. They could easily teach concepts following the text books and not what is recommended in the syllabus.

One other aspect of the study that was of interest to the author was whether or not teachers made lesson plans prior to their teaching. Apart from untrained teachers, all teachers would have been exposed to the exercise of lesson planning while in training institutions. Any effective teaching comes from a proper lesson plan. Teaching without a lesson plan is synonymous to building a house without a plan. The findings showed that all teachers are involved in writing schemes of work with most schemes covering one term.

As far as making lesson plans is concerned, a large proportion (90%) of the heads of departments said that this was not done, that is, teachers do not make lesson plans for the lessons they teach. Instead, they (teachers) use lesson notes for their teaching.

In addition, the data revealed that close to half of the teachers did not write any evaluations about their teaching in the schemes of work. If they did write any evaluation, they wrote in the record of work covered books where they only wrote the word 'covered' after teaching a particular topic.

These findings show that, as far as preparing for teaching is concerned, teachers do write schemes of work. The scheme of work has such vital information as order of topics to be covered, lesson objectives, teaching techniques and resources. The information in the scheme of work provides a useful guide to the teaching process.

However, it was observed that teachers did not use the scheme of work on a day-to-day basis. Many training institutions teach schemes of work as working documents which require teachers to enter information on a lesson-to-lesson basis such as the teacher's remarks. In the schools, it appears once the scheme is prepared it is kept and referred to only occasionally to check for the next topic to be taught. It is also likely that what teachers present in the lessons might not be a true reflection of what is in the schemes of work. That teachers do not write comments in the schemes of work is another pointer that teachers do not use these schemes frequently. What is observed is that teachers write comments in the record of work covered books after teaching each topic. The comments in the work covered book are not exhaustive enough to reveal the strengths/weaknesses of the methods/materials used, appropriateness of assessments, achievements of objectives and so on. In essence, teachers do not

make a critical evaluation of their presentations and record them. This makes them lack evidence to base on if they wish to make any improvements in their teaching strategies, materials used, assessments and so forth.

Teachers unanimously agreed that they do not make lesson plans for their lessons. This obviously affects the effectiveness of their teaching with subsequent lowering of the students' performance. Although the teachers gave reasons for not doing this such as lack of time, lesson notes being sufficient and lesson planning being necessary for training purposes only, there could be more to it. These teachers, most of whom were trained, know the value of lesson planning and in some training institutions, for example, Moi University, the trainees score zero percent (0%) if found teaching without a lesson plan. So why would they not plan when they leave college? Is it an influence from other older teachers in the field or sheer laziness?

According to Gupta (1983), one of the factors that constitute good teaching is careful planning. Lesson planning enables the teacher to select appropriate chemicals and apparatus to use. Although these could be written in the schemes of work, the teacher needs to pre-test them prior to lesson presentation to see if they work according to his/her expectations. The procedures to be followed while conducting a student experiment or demonstration for example also need to be pre-tested at the lesson planning stage. A number of chemistry lessons end up not achieving the expected objectives simply because the experiments did not work as per the teacher's expectations. During lesson planning, the teacher's/student's activities, safety precautions et cetera are written based on the pre-testing (rehearsing) of the experiments to be used in the lesson. Lesson planning gives direction to the teacher and students on the type of activities to be undertaken during the lesson and the sequence of these activities. This leads to the logical presentation of the lesson.

Twoli (2006) and Kafu (2003) add that planning gives confidence to teachers. They argue that during planning, teachers select appropriate content, go over it and organize it in a proper and functional way which will help in achieving the instructional objectives. The teachers can then present the lesson and respond to the students' questions with confidence. Planning enables the teacher to identify the difficulties or problems the teacher/students may encounter as they go through the lesson. The solutions to such difficulties are then incorporated in the lesson presentation. It could be the handling of delicate apparatus, performing a risky experiment, making an unclear observation, grasping an abstract concept et cetera. Aware of the abilities of his/her students, the teacher will plan activities for the

various students. The fast learners, for example, can be given extra work to do as the average students do the work planned for the whole class.

In addition, lesson planning makes the teacher be clear and continue focusing on the objectives he/she wants the learners to achieve. All the learners' and teachers' activities are tailored towards these objectives. Valid assessments, be they formative or summative, should be based on the activities that the learners go through during the lessons. Using lesson notes is an easier way of preparation as the teacher simply extracts material from the text book using the order in it. What is disturbing to note here is that although teacher training institutions spend a lot of time, money, effort and resources in training teachers on how to prepare lesson plans and teaching them the values of lesson planning, teachers do not prepare lessons plans when they finish college.

- Many educators have documented several values of the lesson plan. Kafu (2003) lists some of the values of the lesson plan as follows: It serves as a reminder of what a teacher is going to teach and how he/she intends to teach it
- It encourages logical lesson development and presentation
- It helps the teacher be more confident in front of the class because of the pre-survey done and pre-systematic arrangement of instructional tasks
- Helps in assessing the effectiveness of teaching by focusing on specific aspects of the lesson
- Can be kept as a permanent record which the teacher can use to review subsequent instructional designs

Sample lesson plans from four of the public universities in Kenya that train secondary school teachers, that is, Moi, Kenyatta, Nairobi and Egerton Universities, emphasize two main points, namely that, firstly, all the universities teach lesson planning in their teacher preparation. The second point is that all the lesson plans from the institutions have same components of emphasis which include the lesson topic, the objectives, time for each activity, learning activities, content (except for Moi), methods (except for Nairobi and Kenyatta) and learning resources. Teachers, for example, need to be very clear with the objectives of the lesson. These will guide them in choosing and using appropriate learning activities, methods of teaching, learning resources and the assessments to be given. Appropriate learning activities will reveal whether the teaching is learner-centered or not and whether the activities move towards the attainment of the objectives.

Apportioning time for each activity ensures that the instructional tasks are all done within suitable time.

Resources, particularly if the lessons are to be taught through demonstrations or group experiments, need to be prepared early and pre-tested to check whether they are working according to the expectations of the teacher. A lesson plan needs to be prepared during this pre-testing stage to ensure that the learners' activities in the lesson plan are in harmony with the stages in the demonstration or experiment. The teacher needs to have the lesson plan document at hand and regularly glance at it during the teaching to ensure that the presentation is systematic. Thus, from the discussion above, lesson planning is a must for good teaching. As Kafu (2003) points out, "Generally, effective instruction is normally a product of thoughtful lesson planning" (p. 18).

CONCLUSION AND RECOMMENDATIONS

It is clear that most organic chemistry teachers do not prepare lesson plans for their teaching. In addition, their teaching is also not guided by any written objectives. This conclusion raises questions as to how lessons are conducted without the stated objectives. As such, it is recommended that all organic chemistry teachers prepare lesson plans and use them for every lesson they teach. Subject heads, heads of departments, school head teachers and quality assurance officers should occasionally sit in the classrooms to see if teachers are using lesson plans in their teaching. They should also counter-sign on copies of lesson plans used. Moreover, research specifically targeting lesson plan preparation and use should be conducted to help come up with detailed reasons as to why teachers do not make lesson plans and ways of encouraging them to do so.

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