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Editorial

Making the case for Desktop video conferencing tools for faculty and staff training by educational institutions in the developing world.

The deployment of audio and video communication technologies have become a major instrument for widening the reach of training and staff development. The higher education communities in developing countries are under immense pressure to ensure that staff is trained and in a position to embrace these technologies. As identified by Bell, Martin, and Clarke (2004), the opportunities presented by technology for developing and delivering education and training were outstripping the ability of the educational sector to assimilate and exploit them.

Educational institutions all over the world persist in efforts to make the most of their employees' output in the face of spirited, legislative, and socioeconomic change. More and more, training managers are being asked to improve employee performance in the context of institutional strategy. Given the significance of formal training programs for institutional effectiveness, it is imperative that educational institutions design and implement training programs in the most effective manner, and that they understand the factors that contribute to training effectiveness. Training managers and development executives are becoming passionate in leveraging technologies to train and support employees (Brenan, 2004). There is reason to believe that the significance of training for educational institutions would continue to increase in the future. The quality of employees and their development through training and education are major factors in determining organizational growth. Desktop-Video Conferencing, when used effectively, could provide an effective channel for training.

Videoconferencing tools were first developed to enhance telephony systems with video functionality. Early videoconferencing systems were big, expensive, and inflexible and, therefore, remained in a small niche for a long time. With the emergence of inexpensive broadband Internet connections and the availability of webcams of decent quality, videoconferences are finally receiving their deserved attention. Most of the instant messaging services available provided videoconferencing facilities on an increasing range of platforms, even extending to mobile devices, such as notebooks, handhelds, or Smart phones. Remote natural face-to-face communication between humans is no longer a curiosity. Standardized conferencing systems make videoconferencing available to an array of users, on diverse platforms, with minimal costs (Pfeiffer, Weber, & Jung, 2005).

Furthermore, with the advent of new Internet-based education technologies and the need to make employee development and education more accessible to learners, many organizations with dispersed personnel recognize that to remain competitive they must adopt the distance method of education (Gill, 2006). This certainly applies to educational institutions in the developing world.

The overall use of conferencing tools, such as the DVC, has raised rapidly as more people and organizations have become familiar with their uses and appreciated their value (Greenagle, 2003). With growth in the use of conferencing tools, have come challenges in human resource development in terms of skill acquisition for globally dispersed trainers. Benefits from trainer development in distance education could lead to thoughtful course adaptation.

DVC-delivered training, is distinguished by the social nature of the learning environment. Like face-to-face education, DVC-delivered training supports learner collaboration, interactivity, and group communication (Hampel & Hauck, 2004). In the past, social, affective, and cognitive benefits of learner collaboration have been available only in face-to-face learning. DVC introduces entirely new elements to the learning process.

Hampel and Hauck (2004) pointed to attributes that distinguish DVC-delivered instruction from other modes of education and characterize it as a unique mode: (a) two-way, which allows one-on-one electronic communication between the instructor and individual learners; and (b) many way, which allows all learners to interact together and

with the instructor or tutor via audio or video. Two-way conferencing is more popular than one-way conferencing because the instructor can deliver knowledge while receiving feedback from learners individually.

The early versions of DVC learning were primarily one way only with the dissemination of information via audio, video, or text features to remote learners by instructors. With technological advances, new breeds of DVCs with improved interface and sophistication, synchronous and asynchronous communication features, and screen sharing and archiving capabilities are now the tools of choice displacing older DVC devices (Dooley et al., 2005).

New learning technologies and the growth of the Internet significantly impact the training systems of institutions and organizations. Although the infusion of technology has resulted in virtual training rooms, educational institutions especially ones in the developing world have not taken advantage of its potential as an effective medium for training and staff development. A review of the literature provides the expert guidance needed to design, implement, and evaluate professional development training for a dispersed trainer population.

Erasmus Addae

Editor

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Evaluation of secondary school teachers' application of the systems approach theory in instruction in Ilorin, Kwara State, Nigeria.

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Abstract: This paper evaluated the application of systems approach theory in instruction by secondary school teachers in Ilorin, Kwara State, Nigeria. In order to achieve the stated objectives, a researcher designed questionnaire was used to elicit information on the application of systems approach theory in instruction by 120 teachers from five purposively selected secondary schools in Ilorin, Nigeria. The sum and mean scores were used to analyze the data collected from the respondents in the secondary schools under study. The results showed that systems approach theory in instruction was not being consciously utilized as expected because some of the teachers were not adequately equipped, updated or exposed to the systems approach of learning. Also, most teachers' knowledge about determining the learning outcome, was poor; some do not evaluate or preview the instructional materials used, and students were not always given sufficient time to participate in the learning activities. Based on the findings of the research, it was recommended that teachers should be given privileges of training and re-training on the job and that schools' laboratory should be equipped with adequate and modern instructional materials that would help teachers meet the challenges of the application of systematic approach to learning.

Key words: Evaluation, Systems Approach, Instructional Model, Application/Utilization

1. Introduction

The term "systems" is derived from the Greek word "synistanai," which means "to bring together or combine." The term has been used for centuries. Oxford Advanced Learner's Dictionary (2000) refers to it as 'a group of things or parts working together or connected in some ways so as to form a whole'. Silvern (1969) was of the opinion that it is the organization of an orderly whole clearly showing the inter-relationship of the parts to each other and the whole itself. A system is a dynamic and complex whole, interacting as a structured functional unit. Systems are often composed of entities seeking equilibrium but exhibit oscillating, chaotic or exponential behaviour.

The systems approach is a technique that considers two basic components and these are elements and processes. Elements are measurable things that can be linked together. They are also called objects, events, patterns, or structures. Processes change elements from one form to another. They may also be called activities, relations, or functions. In a system the elements or processes are grouped in order to reduce the complexity of the system for conceptual or applied purposes. Depending on the systems design, groups and the interfaces between groups can be either elements or processes. Because elements or processes are grouped, there is variation within each group. Understanding the nature of this variation is central to the application of systems theory to problem-solving in the classroom.

Systems approach is a problem solving technique. However, it was not until the Industrial Revolution of the 19th and 20th centuries that formal recognition of the "systems" approach to management, philosophy, and science emerged (Bertalanffy, 1968).

According to the definitions by Association for Educational Communication and Technology (AECT) (1977), a systems approach is defined as:

a process for effectively and efficiently achieving a required outcome based on documented needs; a form of logical problem-solving akin to the scientific method; a process by which needs are identified, or problems are selected; requirements for problem solution are selected from alternatives, methods and means are obtained and implemented, results are evaluated, and required revisions to all or part of the system are made so that the needs are eliminated. (AECT 1977, p.165).

Furthermore, Onasanya and Adegbija (2007) submitted that a systems approach could be applied in the development of instructional media. The systems approach is a simplified method to optimize efficiency. Therefore teachers in secondary schools will find it a better choice to facilitate and simplify the teaching-learning process.

The following are the major components of the systems approach model as illustrated by Dick, Carey and Carey (2005);

- i. Identify instructional goal(s) – This is the first step in the model. That is to determine what learners are expected to be able to do when they have completed an instruction. This can be derived from a list of goals

- from a performance analysis, needs assessment, practical experience with learning difficulties of students, analysis of people who are doing a job, or from some other requirement for new instruction.
- ii. Conduct instructional analysis – After identifying the instructional goal, you will determine step-by-step what learners are doing when they perform the goal. The final step here is to determine what skills, knowledge, and attitudes, known as entry behaviours, which are required of learners to be able to begin the instruction.
 - iii. Analyze learners and contexts – In addition to analyzing the instructional goal, there is a parallel analysis of the learners, the context in which they will learn the skills, and the context in which they will use them.
 - iv. Write performance objectives – Based on the instructional analysis and the statement of entry behaviours, you will write specific statements of what the learners will be able to do/achieve when they complete the instruction.
 - v. Develop assessment instruments – Based on the stated objectives, you will develop assessments that are parallel to and measure the learners' ability to perform what you described in the objectives.
 - vi. Develop instructional strategy – Based on information from the five preceding steps, you will identify the strategy that you will use in your instruction to achieve the terminal objectives
 - vii. Develop and select instructional materials – In this step you will use your instructional strategy to produce the instructional materials. This typically includes guidance for learners, instructional materials, and assessments.
 - viii. Design and conduct formative evaluation of instruction – Following the completion of a draft of the instruction, a series of evaluation is conducted to collect data that are used to identify how to improve the instruction. The three types of formative evaluation are referred to as one-to-one evaluation, small-group evaluation, and field-trial evaluation.
 - ix. Revise instruction – The final step in the design and development process is revising the instruction. Data from the formative evaluation are summarized and interpreted to identify difficulties experienced by learners in achieving the objectives and to relate these difficulties to specific deficiencies in the instruction.
 - x. Design and conduct summative evaluation – Since the summative evaluation usually does not involve the designer of the instruction but an independent evaluator, this component is not considered an integral part of the instructional design process per se. However, the nine basic steps above represent the procedures that one employs when the systems approach is used to design instruction. It is systems approach because it is made up of interacting components, each having its own input and output, which together produce predetermined products. (Dick, Carey and Carey, 2005 pp. 6-8), see figure 1.

According to these authors, one of the most important reasons for the success of the systems approach is that it is an empirical and replicable process. Instruction is designed not for one delivery, but for use on as many occasions as possible with as many learners as possible, hence it is reusable. Also, systems approach has been widely accepted and adopted in industry and in military services and can be used to develop all types of instructor-led and interactive group activities.

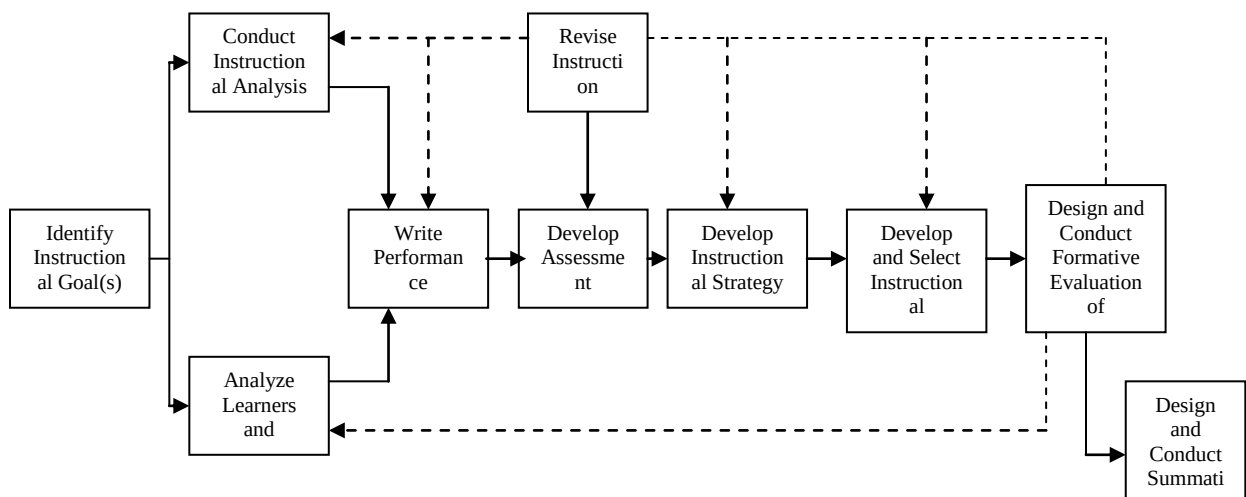


Fig. 1: The Dick and Carey Systems Approach Model for Designing Instruction (2005)

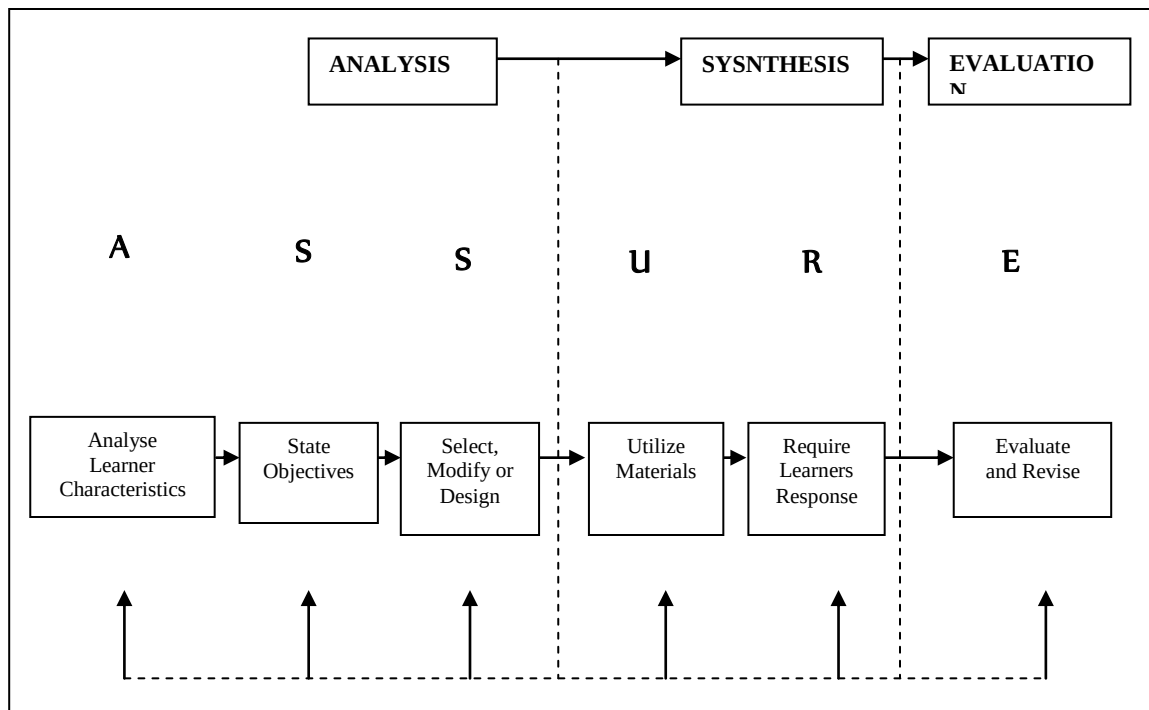


Fig. 2: Source: Heinich, et. al. (1982). Instructional media and the new technology of instruction

Figure 2 shows how systems approach has been applied in the ASSURE model to the design and development of instruction. In the first phase, that is the analysis phase of the instructional programme, the teacher is expected to analyse the learners' characteristics, entry competencies, and the learning style. The next thing is for the teacher to state the objectives, which are the descriptions of the learning outcomes. And finally in the analysis stage is the selection of methods, media, and materials that are essential to the lesson. It is also important to consider the rationale why certain media have been selected, and carry out evaluation of commercial materials. The verbs like identify, name, list, draw, write, define and so on should be used and the criterion test should be in line with the objectives. The materials must be relevant and suitable for the learners so as to make the instruction more meaningful.

The second phase of the ASSURE model is the synthesis stage. This is the stage in which the instructor utilises and previews the materials, prepares the learners and the environment and then provides learning experiences. Also, the teacher requires the learners' responses or participation. To achieve the desire objectives, the right teaching method or technique and media should be used.

The final phase is the evaluation and revision stage, where the teacher considers how the objectives are tested. This is the assessment of learners' achievement and evaluation of instruction including media and methods. It involves the use of previously set criterion-referenced tests to elicit the performance level of learners based on the pre-determined goals and objectives (Ajelabi, 2005). The experience will be evaluated for future planning. Furthermore, the larger rectangular box indicates that the ASSURE model is a system. A *system* is technically a set of interrelated parts, all of which work together toward a defined goal or objective. The parts of the system depend on each other for input and output, and the entire system uses feedback to determine if its desired goal or objective has been reached. (Dick, Carey and Carey, 2005).

2. Purpose of the study

The main purpose of this study was to evaluate the application of systems approach theory in instruction by secondary school teachers using the ASSURE model of instruction. Specifically, the study evaluated the following:

- a) The extent to which the general characteristics of the learners are considered by the teachers.
- b) The problems teachers experience with stating behavioural objectives.

- c) The selection of instructional media for instruction.
- d) The utilization of instructional media for instruction.
- e) The learners' participation in the learning process.
- f) The evaluation of instructional media for instruction.

3. Research questions

The study aimed at providing answers to the following research questions:

- a) To what extent are the general characteristics of the learners considered by the teachers?
- b) What problems do teachers experience with stating behavioural objectives?
- c) How do teachers select media for instruction?
- d) How often do teachers utilize instructional materials when teaching?
- e) To what extent do learners participate in the learning process?
- f) .How does systems approach theory assist teachers in evaluating instructional materials?

4. Sample and sampling technique

Five secondary schools in Ilorin metropolis were purposively selected (based on the size of the schools under study) for this study to cover the major sections of the city. The selection covers both the public and private schools. The selected secondary schools are believed to have equipped laboratory for instructional materials. The number of respondents from each school is as stated below:

- a) Unilorin Secondary School, Ilorin (26);
 - b) Junior Secondary School, Ilorin South, Jalala Estate (15);
 - c) Bishop Smith Memorial College, Ilorin (50);
 - d) Chapel Secondary School, Ilorin (20); and
 - e) Messiah High School, Tanke, Ilorin (9).
- Total respondents=120

5. Data collection and analysis

The researchers employed primary data collected from the selected secondary schools by administering one hundred and twenty copies of the questionnaire (120) to teachers to evaluate the systems approach theory in instruction by teachers in those secondary schools. The teachers were rated based on the extent to which they agree. The researchers then used descriptive statistics to determine the frequencies, sum and means of the result.

6. Data Analysis and Discussion of Research Findings

Table 1: Responses on the extent to which teachers analyse students' characteristics

ITEMS	NO	SUM	MEAN
1. It is compulsory to know the target audience/learners.	92	322	3.50
2. General characteristics (like grade, sex, age, mental ability) are always considered by teachers.	92	287	3.12
3. I have adequate knowledge of learners' entry behaviour (like previous knowledge, skills) which is necessary for effective learning.	88	246	2.80

The teachers' responses on table 1 showed that they agreed that it is compulsory to know the target audience and that they always considered the general characteristics like sex, grade, age and mental ability. The table indicates that there is need to improve on the knowledge of their students' entry behaviour such as previous knowledge and skills by the teachers hence it has low value of 2.80.

Table 2: Responses on problems relating to stating behavioural objectives

ITEMS	NO	SUM	MEAN
4. I always achieve the learning outcome/objectives.	89	257	2.89
5. I have problem knowing behaviours to be stated.	86	216	2.51
6. The condition under which the behaviour will be observed is always perfect.	90	231	2.57
7. I always state the behavioural objectives for all my lessons.	90	295	3.28

Teachers have no problem with stating the behavioural objectives for their lessons as seen in Table 2. However, they have little problem with behaviour to be stated since the mean score is only 2.51. In addition, the condition under which the learners' behaviour will be observed is not always perfect, and there are some problems in knowing their outcome as well, hence the mean scores are 2.57 and 2.89 respectively.

Table 3: Responses on teachers' selection of media for instruction

ITEMS	NO	SUM	MEAN
8. I have no problems in modifying or adapting from the instructional method/material most appropriate to meet the objectives.	90	279	3.10
9. I always select from available media.	88	264	3.00
10. It is always easier for me as a teacher, to design or create my own materials for the students' use.	91	273	3.00

The responses in table 3 show that teachers have no problem in selecting media for instruction because the means scores for the tested variables are above 3.00. It was however observed that this is dependent on the availability of such media in the schools' laboratory.

Table 4: Responses on the utilization of instructional media

ITEMS	NO	SUM	MEAN
11. I always preview the instructional materials before using them.	90	289	3.21
12. I always have and use the equipment in advance.	89	245	2.75
13. I know how to use all equipment in the laboratory.	87	206	2.37
14. Mistakes can occur in the use of media, so there is need to test them before use.	93	287	3.09

It was observed in table 4 that teachers have problem concerning the use of instructional materials (2.37). Also, most teachers agreed that since mistakes can occur in the use of instructional media, they have to be tested prior to using them in the class (3.09). But from the authors' observation, equipment/materials are not supplied to the laboratory as scheduled which often leads to teachers not having the privilege of using them before class demonstration. It is indicated by the low means score recorded (2.75).

Table 5: Responses on learners participation during the instructional process

ITEMS	NO	SUM	MEAN
15. It is important for learners to be actively involved in the learning process.	91	334	3.67
16. My teaching strategy always incorporates practical work/ hand-on-activities in the class.	88	275	3.13
17. There is always enough time for students to have opportunities in participating in the learning activities.	92	272	2.96
18. Teachers lecturing for an entire hour/period is the best.	91	268	2.95

Most of the responses in Table 5 revealed that the teachers agreed that it is important for learners to actively participate in the learning process (3.67) and that they incorporate practical work in the class (3.13). Also, most of the teachers (2.95) were of the opinion that lecturing for an entire period is not the best because learners are not given enough time to participate in the learning process.

Table 6: Responses on evaluating the instructional material/process

ITEMS	NO	SUM	MEAN
19. I always evaluate at the end of each lessons (i.e. summative evaluation).	93	305	3.28
20. Teachers should always evaluate at every stage of the lesson (formative evaluation).	89	284	3.19
21. Media used by me always produce expected result.	89	245	2.75
22. I have no problem with designing an assessment method e.g. tests, examinations, etc.	91	296	3.25
23. I always pre-test the learners.	92	284	3.09
24. I always evaluate performance/grade test.	92	298	3.24
25. I always prepare students for mediated instruction by writing study questions or by giving other cues.	92	291	3.16

Table 6 which is on evaluation of instructional materials, showed that teachers have no problem with formative and summative evaluation. But it is seen that most of the teachers' responses on expected result for media used (2.75) are not strong enough. Teachers could not determine the expected result of the media used during teaching.

7. Summary of research findings

The following are some of the salient findings from the research:

- Teachers need to exhibit more knowledge on learners entry behaviour, such as previous knowledge and skills;
- majority of the teachers do not know the condition under which learners' behaviour is to be demonstrated or observed;
- the condition under which the behaviours are observed are not always perfect;
- many of the secondary schools under study do not have adequate equipment and hence teachers do not always use or preview the equipment/ instructional materials in advance;
- students are not always given sufficient time to participate in the learning activities even though they agreed learners' participation in the learning process is important;
- some of the teachers agreed that lecturing for an entire hour or period is not the best; and
- teachers need to be better exposed to the media that produce expected result.
- Teachers do not have problems with evaluating the instructional process and media selection, though they need improvement on the use of the media.

8. Conclusion

The main purpose of the study was to evaluate the application of systems approach theory in instruction by secondary school teachers using the ASSURE model of instruction. The application of systems approach theory gives a step by step approach to instruction when properly implemented. The findings of this research corroborated with other studies (Adegbija and Adedoyin, 2005; Adegbija, 2006) that teachers generally need more exposure in order to be able to implement the systems approach in instruction successfully. Teachers also require media to implement and make the theory exciting as it is experienced in developed countries.

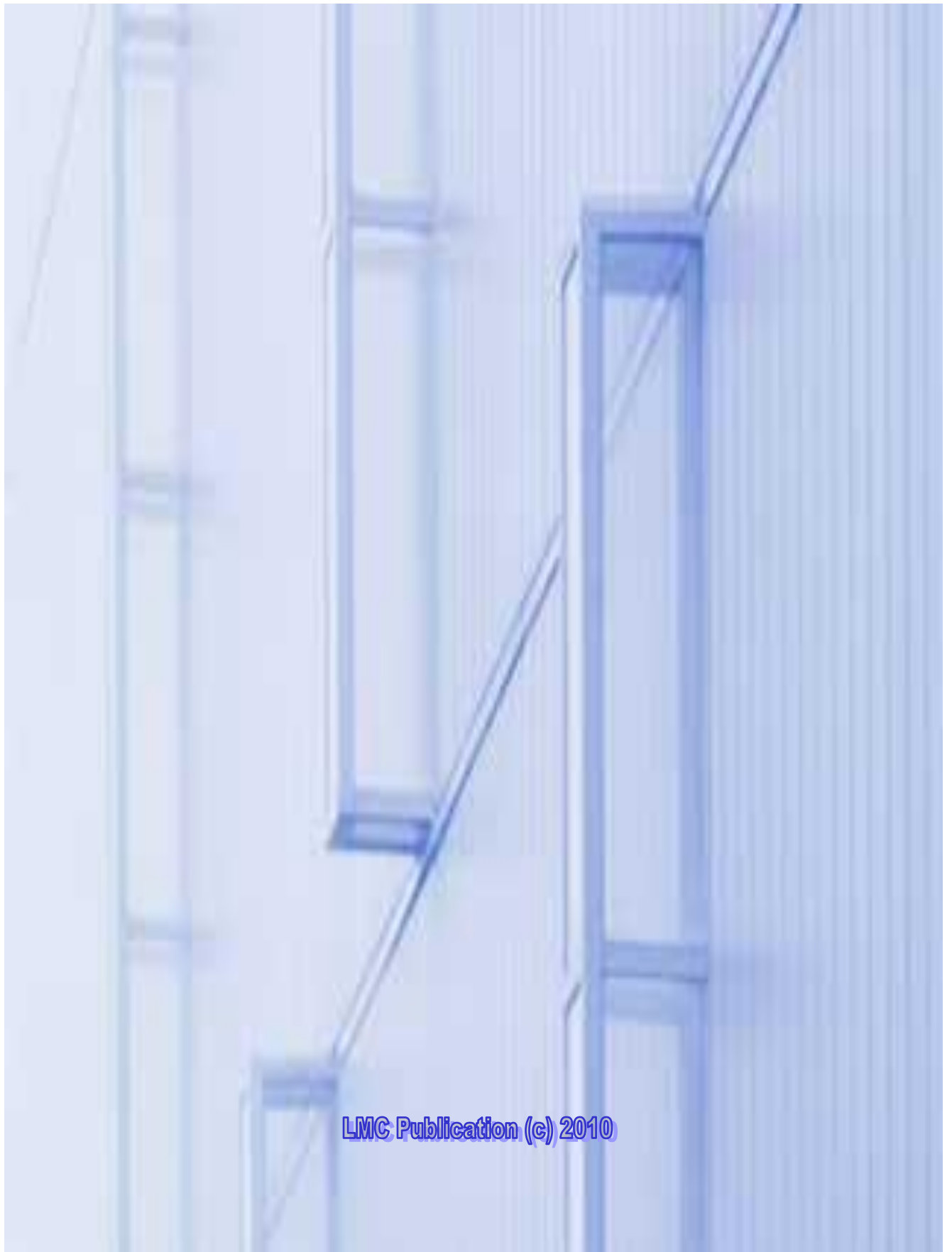
9. Recommendations

Based on the findings of this study, the following recommendations are proffered:

- that teachers should be given the privilege of training and re-training on the job so that they can be exposed to and reminded about the use of the different aspects of the systems approach theory to learning; and
- Secondary School laboratories should be standardized and equipped with adequate modern instructional media to enable the instructor, learner, and the instructional designers to be updated with current technology of learning.

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