PRODUCTION AND FORMATIVE EVALUATION OF AN INSTRUCTIONAL VIDEO ON ENLARGING IMAGES: A PROGRAMME FOR TEACHERS IN TANZANIA

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ABSTRACT

Production and Formative Evaluation of an Instructional Video on Enlarging Images: A Programme for Teachers in Tanzania

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The purpose of this thesis-equivalent was to produce and formatively evaluate an instructional video programme on how to enlarge images using simple methods based on a needs assessment. The programme was intended to provide teachers working in both primary and secondary schools in Tanzania with basic skills of enlarging pictures using three methods namely: a rubber-band, a pantograph and an overhead projector.

Formative evaluation data was gathered from peers, subject matter experts and from a target audience, to provide a basis for revisions to an improved final product. The evaluation procedure employed was based on the approaches to formative evaluation advocated by Sanders and Cunningham (1973); Ardaway (1983) and Baggaley (1986). It involved the pre-developmental activities of a pilot study in Morogoro, an evaluation of programme objectives, a formative interim evaluation of the video design and formative product evaluation. The formative product evaluation stage consisted of feedback

from three subject matter experts (SMEs) and a field try-out with a target audience sample of 50 teachers in Tanzania. Due to time and distance constraints, the field testing concentrated on teachers' opinions regarding the video's quality and its usefulness in the Tanzanian context.

The results were very positive. The teachers found the programme to be a motivational tool which addresses their immediate problems in the teaching/learning situation. Its production quality was rated highly and the majority of respondents recommended its immediate application in the Teacher Education Programmes in Tanzania.

The teachers' responses derived through the questionnaire, and the feedback received from the SMEs, provided an invaluable leverage for the recommended revisions. Cross-tabulation of group responses versus selected variables revealed statistically significant differences in English language proficiency among teachers, which, in turn, affected comprehension of the narration "Kiswahili", the national language and medium of instruction in elementary schools in Tanzania, was recommended to replace he English language in the narration of the revised version of the programme.

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dedication

To my father, **Athmani Levira**, lost, but not forgotten.

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CHAPTER I

INTRODUCTION

1.1 Conceptual Framework

The increasing decline in the national economies of most post-colonial African states, coupled with the rapid increase of educational institutions after independence, has resulted in an acute shortage of basic instructional media materials in schools. In Tanzania, the shortage and inadequacy of instructional media materials in schools has been well documented. (See for example, Omari & Mosha,1987; Mahenge, 1982; Moshi,1977 and Jengo,1971).

According to Moshi, "There is an acute shortage of teaching and learning materials for primary schools and teachers' colleges." (Moshi, 1977 p 306). This includes print based and audio-visual hard and software materials recommended for use across the curricula. The shortage is usually two dimensional. The first, and most crucial, is the non-availability of relevant instructional media materials matching the needs of the learners at different grades of the educational process. The second (usually the most unrecognized problem) is the absence of a reliable dissemination network for the available resources to reach many (if not all) schools in the country.

Considering the existing infrastructure conditions (poor roads, railway and air systems), the dissemination processes are often

arbitrary, and even when initial plans are made, they are not adhered to. Attempts to meet school demands in the last thirty years of independence have perpetually depended upon foreign resources. This was a false approach which not only defeated the National Policy in Education for Self Reliance (ESR), but also continued to drain large proportions of limited foreign exchange just to import "perfect" media materials that were inappropriate for the Tanzanian context and situation. Not withstanding, relevant instructional media materials are the antithesis of traditional verbal methods (Spencer 1991), particularly in the early school years, where visual symbols are a primer for the accurate perception of verbal text.

In his review of research on illustrations, Levin et al (1982) conclude that when illustrations target the critical information to be learned in the text, they have a direct effect on comprehension and retention in young learners (Effect size 1.5). Based on Levin's observation, total dependency of imported instructional materials to different cultural settings is a transient solution to an old problem.

Classroom teachers are the immediate bearers of the challenge who, in the absence of readily available materials, have creatively come up with cheap, but equally effective teaching/ learning materials using resources available in the school premises and their rudimentary skills. The majority, however, lack the creative skills needed to undertake such innovations and

consequently deprive their children of equal exposure to the educational resources, regardless of what school they attend.

1.1.1 The Context of the Problem

The initial training provided in two years of conventional teacher education in Tanzania has proven inadequate for imparting the skills necessary for teacher trainees to develop qualitative media materials for effective classroom applications. This problem may be attributed to the absence of artistic backgrounds when the teacher trainees join the training colleges, but more likely, it may be due to the absence of well trained media instructors in the conventional colleges to offer such skills to these future professionals. Consequently, there has been a perpetual decline of attitudes among graduates regarding the manipulation of available resources to produce instructional media materials for their career purposes.

Certainly there cannot be a single solution to the problem, but indeed, in order to strike the future balance between supply and demand and to revive the declining attitudes, something ought to be done and there has to be a starting point somewhere. A uniform instructional media package for all teachers' colleges, prepared and presented in a similar format and situation, may be an alternative approach to restore teachers' attitudes towards production and application of instructional media materials for improved learning.

1.1.2 The Training Programme

This thesis-equivalent concerns the development of a centralized series of media course package intended to supplement existing audio-visual training packages for teacher trainees and in-service teachers in Tanzania. Its emphasis is on the improvement of teachers' skills in terms of basic innovations and applications of instructional media materials using local resources. The package adopts a Linear Video format whose development process should observe acceptable procedures in educational technology, particularly FORMATIVE evaluation. Thus, the project features:

(1) Developing a training package whose content will help teachers to develop skills regarding how to enlarge a picture using affordable methods.

(2) Conducting formative evaluation of the package production process to ensure perfection of the final product.

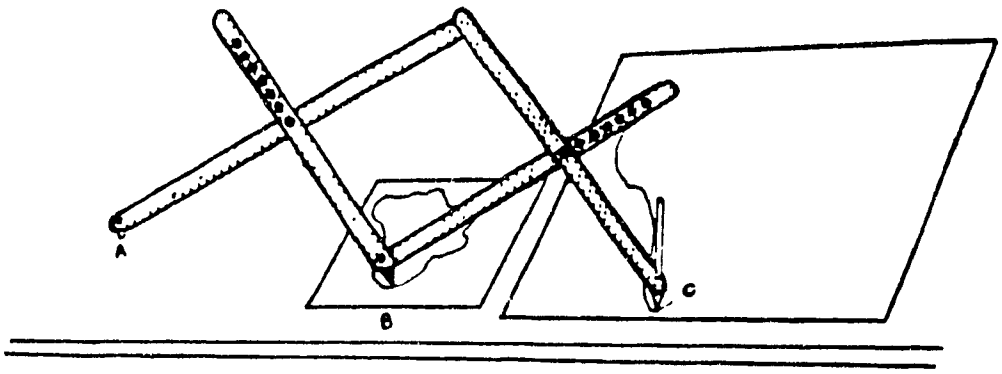
1.1.3 Operational terms

"The meaning of every term we use depends upon the theoretical context in which it occurs and they obtain their meaning by being part of that theoretical system" (Feyerabend, 1965, p 180). The following key terms are used in the thesis-equivalent with the following meanings:

1.1.4.1 *Pantograph*

A pantograph is a simple device comprised of four pieces of graduated bars joined together (as illustrated in Figure 1) with loose pins to allow for free movement. When one end of the device is fixed on the table and the loose end is manipulated, the middle joints move at a pace and distance corresponding to that of the manipulated end. Its corresponding back and forth movement allows the device to be used for the enlargement of simple pictorial images. The process is demonstrated in the video programme.

Figure 1: *A Pantograph*



1.1.4.2 *Rubber-band*

Rubber-bands are thin rubber rings of varying sizes and colours, commonly used in offices for tying small items together. When more than one ring are joined together to form a rubber "chain" (as illustrated in Figure 3), and one end is fixed on the working table while the other is manipulated, the rubber-band "chain"

(like the pantograph) provides a stretching out feature that makes it an alternative tool for enlarging simple pictures. The video programme demonstrates this process.

1.1.4.3 *Educational Technology*:

Educational technology is a scientific systems' approach to educational problems which Gagne (1968) defines as an educational

Figure 2: *Rubber-Bands & Rubber-band "chain"*

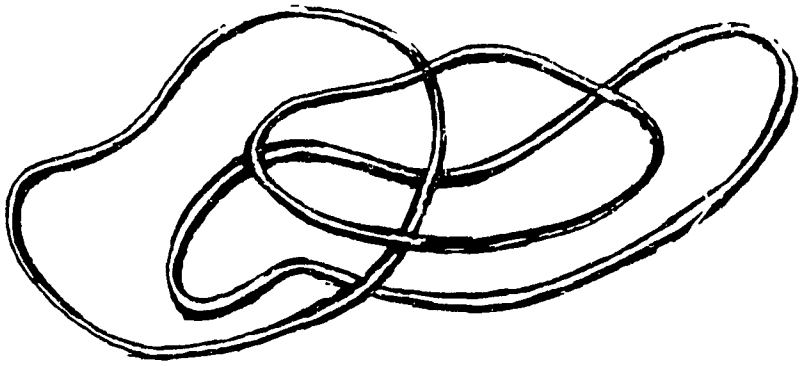
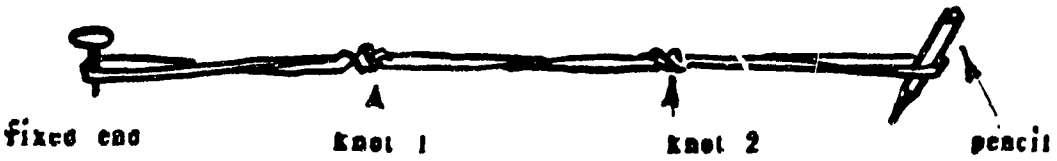


Figure 3. *Rubber-band "chain"*



engineering process that draws upon many disciplines including designing, implementing and evaluating educational work, space,

equipment, social environment, administration procedures and conditions for effective learning.

Conditions for effective learning are those conditions which maximize learning opportunities by availing relevant resources and systematic sequencing. Such supportive opportunities include feedback control systems, where both the learner and the instructor form a model of each other so that the instructional process becomes what Corey (1967) defines as:

> "The process whereby the environment of an individual is deliberately manipulated to enable him to learn, to emit or engage in specified behaviour as under specified condition or as responses to specified situations". (Corey,1967)

In that context, educational technology concerns itself with educational excellence, by scientifically designing, implementing and evaluating educational activities, as stated above.

1.1.4.4 *Medium/media*

A medium is a means or "vehicle" by which sensory organs of an organism are amplified to improve delivery of new experiences in the organism's environment. Media, the plural form of medium, comprises of two major categories, namely the audio and visual media. Audio media, support the auditory system to get accurate verbal sound symbols, while visual media support the eye (vision). Real (tangible) objects, or their pictorial representations, illustrate the visual category while Audio Cassettes, Radio and Telephones illustrate the audio category.

Communication media of the current technology embraces computer softwares, video & interactive video programmes, teaching machines, physical objects and many others which constitute as media equipment available for educational processes.

Language is a medium often forgotten when mentioning media. The natural features and innate abilities present within humankind convert mental messages into sounds of language symbols (Fiske, 1982). This, in turn, makes the language medium a fundamental tool without which other media can hardly operate. in other words, interpretation (decoding) of any message in any other media is dependent upon the language in which the message was 'coded' by the sender. Under the heading of language, it is also logical to include such media forms as drama, folk lore, music and dance, which are the traditional message vehicles used in all indigenous societies.

1.1.4.5 *Feedback*

Feedback is a system within a larger system, which tends to maintain a prescribed relationship of one system variable to another by comparing functions of these variables and using the differences as a means of control (Mayr,1969). An example of a feedback system is the automatic closed-loop feedback system of the in flush-tanks, which stops the water flow as soon as the tank is full. More complicated examples are the human body feedback control systems, which include the body temperature

control system, respiration and glucose concentration control systems.

Like the human body, education (a system and a process) has (or should have) feedback features which control its functioning for effective learning processes. At the classroom level, there is a feedback control system within and among the learners/ instructors (and their environment) to control their interaction and to facilitate effective learning.

1.1.4.6 *Formative Evaluation*

Formative evaluation is a process within the cybernetic model of instructional material production process which is used to obtain data about the effectiveness of a product during it's development stage in order to provide feedback for revision of the material before it reaches a final product. Contemporary research reviews (as we shall see in the related literature) show that revision of instructional media materials based on formative evaluation in the production process has had a significant impact on the finished product. Its applications have been reported throughout the years, from Rosen and Abedor in the 1960's through to the contemporary formative evaluation research people like Spencer, Baggaley and Coldevin in the 1990's. This thesis-equivalent was implemented along those lines: the need to have authentic data upon which to base modifications of the video programme.

CHAPTER II

REVIEW OF RELATED LITERATURE

Review of related literature for a project which involved the production and formative evaluation of Instructional Media Material was thought proper to cover both areas of the "selected media" on the one hand, and "formative evaluation" on the other. On that background, Part One of the literature review briefly explores Video technology and its application in education, while Part Two concentrates on conceptual analysis and the realities of formative evaluation.

2.1 Video In Education

Recent research reviews and findings have indicated a positive influence of instructional video programmes based on their moving image potential. And yet the term "video" and how it improves learning is still blurred in the minds of many educators (Millerson,1987 p.1).

According to Millerson, the term "video" and "television" are used so interchangeably that distinctions between the two terms have become increasingly confused. The Dictionary of Communication and Media Studies defines video as "A process whereby TV programmes can be recorded on a cassette tape" (Watson & Hill, 1984, p.174). Both Video and TV use similar function features on electronic principles, and when such is the case, people tend to

generalize and use the two terms interchangeably. But how could either of the terms be used to define the other?

According to Mcinnes (1980), "Video" is an electronic process of recording and playing back audio and moving images on an electronic magnetic tape. Pre-recorded tape may then be played back on a playback machine and both audio and moving images displayed on a TV monitor. A more recent technological innovation records video signals on discs whose playback is linked with computer technology to acquire an "interactive video" format. To distinguish between the two formats, most people now call the former, "linear video" (non-branching).

Television, on the other hand, combines two concepts. "Tele" means far off, or at a distance, and the suffixes attached to "tele" further describe that notion. In tele-graph for example, "graph" signifies signals transmitted as electronic impulses along wires or space. In television the word stem "vision" is an analogue to seeing. Television therefore is seeing images transmitted from a distance. The transmitter sends images through the space as modulation carrier waves of electromagnetic radiations. Upon a receiver, these signals are decoded to visual images and displayed on a TV screen. Based on their technical linkages, a VCR records TV signals in the same way as it records with a video camera and it is for that reason, we could assume, the two terms are often interchanged.

In recent years, video technology has proven to be a powerful tool for communication in general, and for instructional communication in particular. According to Coldevin,"Video has advantages over other mass media because of its flexibility: where learners have control over the information flow by repeated play, freeze frame, thus messages played repeatedly until well understood, "(Coldevin,1988 p. 226). In video, like in TV, linguistic and pictorial symbol systems are transient and presented simultaneously. In such formats, learners or viewers process the information faster than the back-and-forth serial processing of linguistic and representational information in textbooks (Kozma,1991).

Kozma cites many examples in school curriculums in the US, Europe, Australia, and in some developing countries where video technology has played a significant role . According to Kozma, video technology not only out-performs verbal and still picture media in education, but across every discipline.

In medicine, for example, the Royal College of Surgeons in collaboration with the Royal Society of Medicine in UK utilize video technology depicting skilled surgeons demonstrating medical and surgical techniques to practitioners. According to Ahmad, (1991) effective educational video programmes are also produced by the American Studies Resource Center of the Polytechnic of Central London, depicting the history and culture of the United States. For vocational training, topics covering new

technology, health, safety and industrial relations are a common feature in their respective study places.

In teacher education, there is a steady growth of literature on the use of the video format in pre and in-service teacher training (Schretter, 1990; Laporta & Schino,1990). Ortiz, (1985) reports the use of video taping in micro-teaching for self assessment as a valuable strategy of teacher education for teaching bilingual children. In West Germany, an initial experiment of video application in the training of teachers as reported by Whybra & Prinzing (1984), increased the confidence of teacher trainees, and reduced their levels of anxiety.

According to Whybra & Prinzings' report, the overall experiment was found to be a psychologically stabilizing factor in class, and has led to other instructional ideas. Goodman (1985) and Grosvenor (1987) went further beyond video taping for self-evaluation and demonstration of class methodology. In Goodman's article, "Video in Second Language Teacher Training", the author reports on the successful application of video technology, as it is being used by teachers and teacher trainees to tailor instructional materials relevant to their situations (especially in language classes for special purposes). He suggests further use of video technology in classroom research and observation. Other reported video applications in teachers' education includes those from Hawaii by Anderson, (1989); England by Wright, (1990); Nigeria by Akinyemi, (1986); Japan by Yoneyama, (1988A) and in Israel by Eylon, (1984).

Encouragingly, video technology is also becoming increasingly popular and a powerful tool for rural development. Coldevin (1988) reports about video application in Development Support Communication (DSC) by FAO & WHO for rural development in Fogo Island, the Canadian province of Newfoundland in the late 1960's, Peru in the 1970's, Mexico in the 1980's, and many others in Latin America, Africa and Asia. In his concluding remarks, Coldevin writes, "The surging international interest in video as a communication tool has been fuelled by refinements in the technology itself". That concurs with Mcinnes, (1980) who also notices the refinement and asserts that video has increasingly become a handy instructional tool. Mcinnes, in turn, urges every educator to consider its applications when planning for an effective educational strategy.

On this background of an increasing success in the application of video technology, as indicated above, the video format was thought to be an appropriate tool capable of lending itself as an effective means of delivery for this project. The project objectives, as described in Chapter I, required live presentations which are well-suited to the video format. The following section describes the video programme to be evaluated.

2.2 Description of the Video Programme

2.2.1 Form & Content

A thirty-minute video entitled "ENLARGING IMAGES" was produced by the author during the period indicated in the time-line (Figure 4). The video demonstrates three methods of enlarging images by using a rubber band, a pantograph and an overhead Projector. The scene begins with an introduction intended to illustrate a need for programmes to assist teachers in their career commitments. Two female teachers (looking at a picture display) identify a picture which, according to one of the teachers, it would be a good aid for her next language class. Her peer accepts this idea, but questions the size of the picture in relation to the class size. Eventually they both agree that the picture should be enlarged, and being so enthusiastic, the teacher starts to enlarge it on a large sheet of paper. To her disappointment, however, her sketch looks totally different from the original. Eventually she ignores the picture and decides to teach without it.

At that point a voice-over picks up from the teachers' dialogue and invites viewers to join a programme that would take them through three different methods of enlarging images to avoid similar frustrations in the future. The three methods are then demonstrated with full close-ups. After each method is demonstrated, viewers are presented with two problems which they are supposed to react to as a part of a practice stage. A summary of points covered is provided at the end of the video.

2.2.2 Target Audience

The package is intended to serve teachers as well as teacher trainees in conventional teachers' colleges in Tanzania. Undergraduate (Education) students at the University of Dar es salaam would also benefit from its content. It will be implemented through week-end and short courses for serving teachers, and in the normal training schedule for teacher trainees. (According to a discussion between the author and the director of Teacher Education in July 1990, the directorate had acquired video equipment to be distributed to all teachers' colleges for training purposes).

The academic status of the target audience varies depending upon entry levels. Students in the conventional teacher training colleges, for example, have successfully competed four years in secondary schools with or without a background in Fine Arts. Emphasis in their teacher education programme includes methodology and class management skills to be developed through the integration of theory and practice. Upon graduation they are posted to teach (without specialization) in elementary school grades one through seven.

University students normally fall into two categories. The first category embraces direct entrants who have successfully gone through the school system to high school (Grade 14) and subsequently served in "national-service" for two years. The

second category includes more elderly students who join the university under a "mature age entry" scheme.

The school backgrounds of these two groups vary in many respects, but they both should have successfully gone through basic secondary education to form IV (Grade 12), followed by teacher training and a considerable amount of work experience. To establish a common entry point they write a university entry examination, and thereafter both categories of students are treated as equals. Their training covers, besides their two teaching subjects, studies in Educational Psychology, Philosophy of Education, School Management and Administration, Educational Practices as well as Advanced Theories and Practice of Education. As in the conventional colleges, the undergraduate programme in education is designed such that students engage themselves in both theory and practice of education. The majority of the programme graduates join the teaching crew in public secondary schools, teachers colleges and some are called to take senior administrative positions in the education hierarchy.

2.2.3 Language

Kiswahili is the national language of Tanzania and the medium of instruction for primary levels one through seven. It is also the language of instruction in junior conventional teachers' colleges where primary school teachers are trained. English is used as a medium of instruction in most post secondary institutions/

universities. Otherwise English is taught as a subject from primary three through the school system.

English was used for the purposes of this instructional programme and the formative evaluation exercise. It was believed that the sample subjects (as will be analyzed later), had an adequate level of English proficiency to understand the programme. Using English would allow for contributions from English speaking peers and from Subject Matter Experts at the development stage, and would avoid language translation in the final write-up. It was the authors intention, however, to use Kiswahili in the final product.

2.2.4 Instructional Goal

Given a well produced media package demonstrating how to enlarge images, the teachers, upon viewing the programme, should be able to appropriately select and apply one method or technique to enlarge a pictorial image to about five times its original size. For its sub-goals, it was expected that after viewing the video programme the viewers will be able to:

i. Choose an appropriate method of enlarging an image based on the complexity of the image, details required and available resources.

ii. Assemble and operate the required equipment for the chosen method.

iii. Transfer intended images with maximum accuracy, using the demonstrated methods, and

iv. Demonstrate maximum mastery of picture finishing skills, including shading and framing.

2.2.5 Production Procedure

2.2.5.1 *Pre-production stage.*

The pre-production stage involved appraisal of the demonstration designs, materials budget and equipment required. A draft storyboard was sketched and tested with a peer group in the department of Educational Technology at Concordia University. A script draft to be narrated over the demonstrations was developed and a tentative time-frame charted. Bookings for equipment and facilities in the department of ETEC were made accordingly.

2.2.5.2 *Production Stage*

All camera work was done at the department, in a room with basic classroom features (ie. chalkboard and a few wall hangings). The production crew comprised of two people, namely, Scott Mackay, a peer graduate student in the Educational Technology programme who served as the camera expert, and the author as the demonstrator (strictly off camera). Most footage captured the demonstrations from different camera angles and

close-ups to provide a variety of clips for effective editing.

Text screens for notes and summaries were created using "Tilter" (in the Amiga Computer environment) and recorded directly onto a videotape. Editing was done by the author using facilities available in the department. Narration and background music was superimposed after editing.

2.2.5.3 *Post production stage*

Because the video was produced in NTSC, a system used in North America, it had to be converted to PAL, which is the system used in Tanzania. This was accomplished at the video studio of McGill University (the costs for the conversion were borne by the producer). The converted version was then sent to Tanzania and the administrative logistics discussed with Dr. Mahenge (AV instructor at the Faculty of Education at the University of Dar es Salaam), when the author visited home (Tanzania) in August, 1991.

2.2.6 *Production Costs*

Costs incurred in the video production stages, as outlined in Table1 below, were met by the author, but the equipment and technical expertise was provided by the Department of Educational Technology (Concordia University) free of charge.

2.2.7 *Equipment*

Equipment used for the production of the video programme included among other items:

1. VHS Video Camera	1
2. Tripod	1
3. Portable monitor screen	1
4. Lighting kit	1
5. Titling generator (Amiga)	1
6. Editing facilities (set)	1
7. Over head projector	1
7. Pantograph	1

Note: The last two pieces of equipment were demonstration tools.

2.2.5.6 *Materials*

Initial materials required for the video production process were as follows (costs were met by the producer).

The following section surveys the existing literature which supports the rationale for the use of formative evaluation strategies.

2.3 Formative Evaluation: Its Definition and Realities

2.3.1 Towards a definition

The term "Evaluation" is popular in the literature of Education, and is commonly defined as a formal process of assessing the merits of an educational programme (ideally through the learners) to provide information for decision making. But when

paired with the term "Formative" to form "Formative Evaluation", its concept has become blurred amongst many educators. Although

TABLE 1

VIDEO PRODUCTION BUDGET

No.	ITEM	QNT	TOTAL COST
1.	VHS Video tape 120-2 hrs.	1	$ 10.00
2.	VHS Video tape 60-1 hrs.	1	$ 15.00
3.	Audio Cassette - 60 m	1	$ 5.00
4.	Manilla paper -imperial	10	$ 10.00
5.	Markers 3 colours	3	$ 10.00
6.	Transparencies	5	$ 5.00
7.	Water colours. (set)	1	$ 10.00
8.	Conversion charges (est)	1 copy.	$ 50.00
9.	Honorarium (@ $ 20.00)	2 assist.	$ 40.00
.10.	Camera man (@ $ 20.00)	10 hrs.	$ 200.00
11.	Producer (@ $ 20.00)	25 hrs.	$ 500.00
	Total Est. Cost.		$ 855.00

the history of formative evaluation practices trace as far back as the early 1920's (Cambre,1981), the literature dealt with the terms in a very simplistic fashion.

According to Webster, the word "formative" originates from a Latin word 'Formatus', generally described as being capable of (or subject to) alteration by growth and development. While the description seems related to the state of formation, fashioning or moulding, it leaves a lot of questions unanswered.

In its operational terms, formative evaluation is a process used to obtain data about the effectiveness of a product during its development process. Until the late 1960's, evaluation decisions were primarily based on comparisons between the merits of new materials versus old materials. Often newly developed programmes were judged less effective (Dick & Carey, 1978). According to Dick (1980), cited in Palmer (1988), the emphasis of formative evaluation is on data collection which provides feedback that enables the material developers to make appropriate changes or revisions in form and or content to achieve a perfected end-product. That implies a continuum of cyclic features implemented in a systematic manner within the production process. In more operational terms of formative evaluation, all prototype (sub-segments making the whole instructional programme) are repeatedly tested using all possible evaluation variants (including target audience samples) to ascertain material quality and effectiveness of the end-product.

'End-product' of an educational process is knowledge or its representation acquired as a function of the process, but the "End Product" as used here, refers to the final version of an instructional media material (IMM) or software. Such materials include, among others, physical objects (alitalia) or their representative models, pictorial based materials which range from still pictures to electronic moving images, print based, programmed learning and computer assisted instruction (CAI).

As noted in the literature on the role of media in education, all these are vehicles or channels by which interaction between the knowledge source and the learner in the teaching/learning process occurs.

Spencer (1991) groups IMM into media models and methods. He groups all picture based media as "picture models" while computer aided, programmed learning, audio materials and group organizations are considered as methods of instruction. Developing such software capable of delivering messages pertinent to such pre-determined objectives is a complex process that requires constant verification at every level of development, which is the whole function of formative evaluation.

2.3.2 Formative vs. Summative

When Scriven (1967) coined the term 'Formative Evaluation' he drew a clear distinction between Formative and 'Summative evaluation. Adhering to his former distinction Scriven (1980) maintains that formative evaluation is conducted during the development stage for improvement of a programme or a product. In that context, Lewy (1985) confines formative evaluation to the producers' consumption. According to him, although formative evaluation may be done by either internal or external evaluation, or preferably a combination of both (p. 27), it is conducted for "in-house staff" and normally remains "in the house". Summative evaluation, on the other hand, is conducted after the completion

of a programme to ascertain or confirm its instructional effectiveness to the producers, funders and prospective clients.

Scriven differs from Stake (1977) in that he adheres to the view that there are no logical and methodological differences between formative and summative evaluation. In contrast, Stake (1977) provides explanations of the terms to differentiate amongst the two, and contends that the former focuses on relatively molecular analyses, cause seeking, and is more interested in the broader experiences of the programme users, but tends to ignore the local effects of a particular programme.
In turn, Stake claims that the latter focuses on molar analyses providing descriptive information and is more interested in efficiency statements while emphasizing local effects.
Essentially the two terms are intended to examine or investigate the worth of a particular entity at a particular point in time. Features like timing, questions asked, interpretation and application of the findings discriminates the two. Otherwise an evaluation viewed as formative evaluation by one client may seem summative to the other.

2.3.3 Why Formative Evaluation?

When considering why we should formatively evaluate instructional packages during their development process, many questions arise. One may ask, for example: Is formative evaluation worth the cost? Does a designer have authentic evidence to convince the funders that the formative evaluation

exercise is worth the anticipated costs? What benefits does formative evaluation offer the designers?

When addressing 'the power of media' Baggaley (1973), quoted in Palmer (1988), suggests four teaching functions which an instructional media should have. Firstly, it must have the ability to present logically the developmental sequence of information. Secondly, it should be capable of reinforcing information either by repetition or variation of forms. Thirdly, it should have the capacity to establish a kind of relationship with the learner and itself in order to effect meaningful interaction. Finally, it should have the potential of addressing individual questions of the learner. (Baggaley, 1973, p.140).

Assuming that instructional designers pre-set instructional objectives and develop materials relevant to their pre-determined objectives and audience, as stated above, how would they ascertain that their final product meets the objectives? What criterion would they, for example, use to determine the extent to which their audience will accept the medium, let alone its effectiveness in the teaching/learning process?

Baker (1970) confirmed Rosen's (1968) findings that any kind of formative evaluation improves the effectiveness of an instructional material. In his study, Baker compared several instructional materials, each prepared and tried-out with three different target audiences. The materials were then revised on

the basis of these findings. Both the original and the revised materials were then tested in the summative evaluation. The results showed that revised materials were more effective in promoting students' learning than were the original materials. Since then similar findings have increasingly been recorded (see for example, Abedor, 1971; Kandaswamy, Stolovitch & Thiagarajan, 1976 and Wager, 1983).

Not withstanding its value, some administrators still consider formative evaluation to be a waste of time. Yet one only needs to consider the opportunity cost otherwise incurred by avoiding formative evaluation. It is safe to avoid it only when the anticipated effects of the instructional materials are either positive or will have no effect upon learning. But if a negative effect is yet another possibility, then the finished product may be hazardous and culturally unethical if formative evaluation is not incorporated into the design process.

Let us consider, for example, the AIDS campaigns currently carried out in most countries to illustrate the point. If the campaign unwittingly promotes prostitution, as opposed to their intended objectives, or creates fear and other boomerang effects to the high-risk audience, then it may have unfavorable effects to the social order. It may, for example, hamper productive forces due to the anxiety of those at high-risk, and by that way affect the national economy. Control measures, like incorporating a "formative evaluation" component in the design process of the

campaign to single-out and rectify distracting elements before they get to the people, is certainly worth any cost incurred.

Encouragingly enough, since the mid-1950's communication theorists like Rose and Van Horn (1956) (cited in Cambre,1981) acknowledge the importance of pre-production testing in the context of communication theory now practiced by most dynamic designers. Andrew and Goodon, (1980), for example, found out that in the 40 instructional design models that they viewed, only 5% of them had no formative evaluation component while 95% considered it to be invaluable.

2.3.4 Approaches to Formative Evaluation

As already noted above, effective formative evaluation involves a continual process of obtaining feedback data subsequently used for decision making in selecting alternatives in the revision stage. However, as Weston (1986) points out, the approaches to the formative evaluation cycle and the sources of data can vary depending upon the basis of particular situations. According to her, these sources of data may include (i) self-evaluation of the material developer, (ii) expert review whereby a subject matter expert (SME) views the materials and provides feedback for revision, and (iii) developmental testing.

In developmental testing, Weston again lists three phases, namely; one-to-one evaluation, group evaluation and field testing.

Weston, however, expresses the absence of a single algorithm for the formative evaluation and, to use her terms, says:

> 'There is not a single set of heuristics, or guidelines. ..There are several approaches that share certain features in common, but which differ along various dimensions." (Weston 1986, p.7')

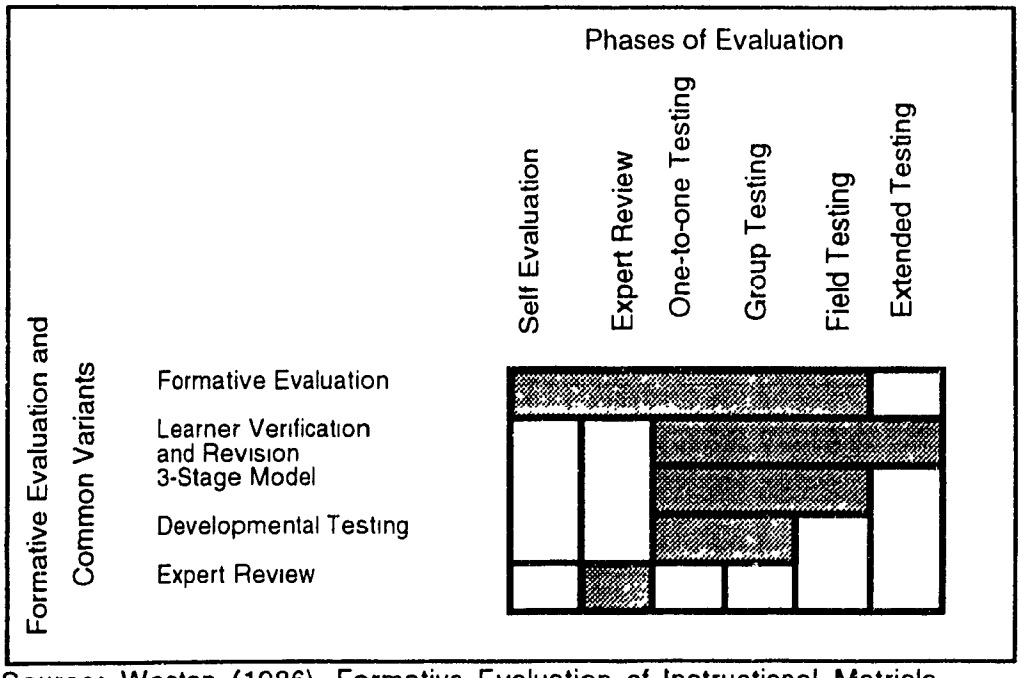
She considers a multiplicity of approaches and, in turn, proposes a six stage model with five variants. In her model, formative evaluation includes self evaluation, expert review, one-to-one testing, group testing, field testing and extended testing. Figure 4 summarizes Weston's model of formative evaluation variants.

The expert review approach (adopted from Montague,1983) proposes one or a series of experts reviewing prototype materials to point out areas for improvement. Its major flaw, however, (to be discussed later), is lacking the inclusion of target audience responses in formative evaluation. Contrary to this omission is the developmental testing approach adopted from Henderson & Hathenson (1976) which requires that target audience should be used as primary sources of feedback data for instructional material revisions. The author adopts the three stage model approach developed by Dick & Carey (1985), which suggests three sequential stages of testing with individuals, groups, and field testing respectively.

Although the learners' verification and revision approach

detailed in Komoski & Woodward (1985) is similar to the three stage model, it is unique amongst others in that it recommends the try-out and revision cycle to continue for as long as the material is in circulation. That answers basic questions like; For how long do valid materials remain valid? or; Could a software previously found effective in a particular setting be equally effective today? As already stated, when the quality of materials is thought to have been affected by the passage of time and a test to determine desired revisions is conducted, then the exercise is still worthy of the name 'formative evaluation'.

Figure 4: *Formative Evaluation Variants*



Source: Weston (1986), Formative Evaluation of Instructional Matrials, CJEC 15 (1) p.9

2.3.5 Selecting an appropriate approach

Selecting an appropriate approach to formative evaluation is dependent upon an unlimited number of variables applicable to different situations and limitations. Authors like Stake (1967), Weston (1986), Jamelka (1981), Baggaley (1986), Dick & Carey (1990) propose distinct models recommended for effective formative evaluation processes, some of which are appropriate for specific media formats (see for example, Baggaley's (1986) model in Figure 5).

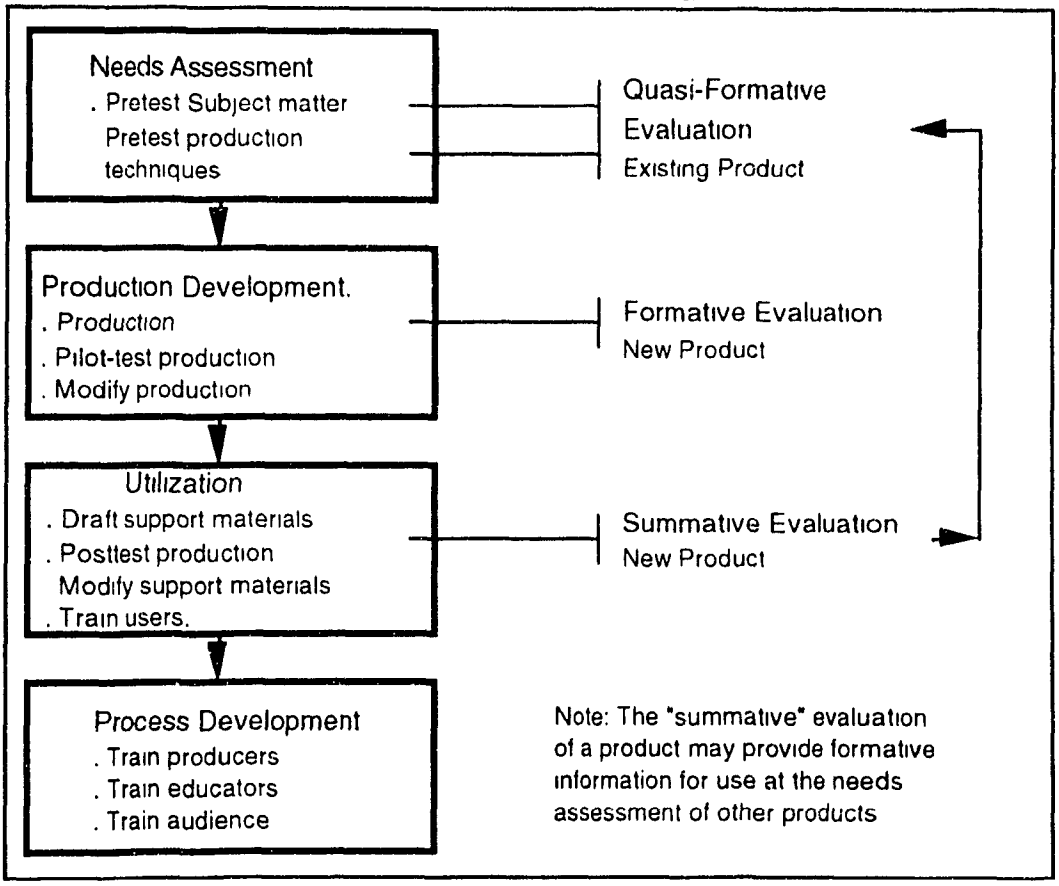
Some of these approaches may be costly in many respects and some require more time than is offered due to deadlines. Others even suffer limited access to valid representatives of the target audience. Yet, as recommended by the authors (listed above), the more the variables, the better the feedback for revision purposes. That triggers an interesting concern which is discussed in Baggaley's (1986) article, *Formative Evaluation of Educational Television.*

To conceptualize the base of his discussion, let us imagine for example a television programme of an event valid for a specific point in time. How will it be formatively evaluated considering its sensitivity and urgency? Solutions to such challenges were not easily arrived at until the discovery of Programme Evaluation Analysis Computer software (PEAC), which Baggaley discusses in his article above. The equipment records, moment by moment, the viewers' responses to images as they appear on the TV screen,

and automatically represents the results in graphic representations on a computer screen. The evaluator then considers the fluctuations in the low and high peaks for his or her revision purposes.

As it stands to-date, nobody doubts about the efficiency of this approach in the formative evaluation process. Examples of case

Figure 5: *Stages in the Development and Formative Evaluation of Media Materials*



Source: Baggaley (1986), Formative Evaluation of Educational Television CJEC 15 (1) p. 41

studies like the US Presidential debates in November 1980, the impact of smoking prevention films in Canada (1981), and the formative development of a skin cancer film in Canada (1983), confirm the effectiveness of the PEAC approach to formative evaluation. (see Baggaley, 1986).

Sander and Cunninghams' formative evaluation model (1973) suggests a four stage process that allows for several sources of data. The first process involves a "pre-developmental activity", where a "needs assessment" is conducted before the product development commences. That is followed by an evaluation of instructional objectives. As soon as material development begins "Formative Interim" evaluation also begins. That entails a variety of activities, like critical appraisal by experts and target audience sample tryouts of a pilot version. The final phase is the "Formative Product Evaluation", which involves a larger-scale tryout of the product under actual field conditions (which sounds more summative).

In his article entitled *Corporate Training and Development*, Ardaway (1983), like Weston, implicitly recommends that evaluation strategies must take into consideration the practical constraints of the context. As Ardaway puts it, the time constraints imposed by corporate deadlines often mean that low priority is often given to the evaluation process. Consequently, Ardaway recommends a time-saving model that combines pilot or small group testing and field testing into a single on-site

activity. In this model, a working (but not necessarily a finished) version of the material is administered to the target group sample (small enough to allow for detailed feedback) under actual field conditions, and the data obtained may be used for deciding alternative improvements on the particular segment or the next to be developed.

Systematic application of such variables as self-critique, peer evaluation, subject experts and learner verification, conducted in the light of available resources and limitations, may very well meet the objectives. Tovar & Barker (1986) demonstrated a simple approach for the formative evaluation of computer software for reading skills, and the results were encouraging. For this reason, the choice of formative evaluation approaches should consider superiority of approaches that favour simplicity over complexity.

Contemporary discussions on formative evaluation include interesting questions of whether or not to include prospective target audiences in the formative evaluation process. This is one of the flaws in Montague's (1983) model noted in Chapter II. Montague suggests expert review as an adequate measure of valid feedback upon which to base revisions of instructional materials. That is quite contrary to other authors who contend that at whatever cost, data collected from target audiences are more superior than data from most other sources. The later does not reflect the realities of how the target audience would react to

the materials. As it may be noticed, instructional media materials are extensions of human senses (sight, taste, smell, touch and hearing) which are basic inlet channels of information to a learner. By nature, human beings are unique in the way they perceive their environment, and for that reason they are difficult to represent in the selection of knowledge vehicles. It is also becoming increasingly obvious that what parents thought would have been appealing to their children has always proven the opposite, and the children, like adults, have their own taste and perception of the world around them.

Learning, as noted by many educationalists, is a personal process which goes on exclusively in the mind of the learner. Educators can only facilitate this process by creating conducive atmosphere for the learner to choose and adopt, but have little or no control over it. How then can we develop such vehicles of knowledge and claim it appropriate without involving members of the target audience? The current author considers inclusion of the target audience in the formative evaluation model as mandatory.

Caufman (1980) briefly raises a very valid point in an essay he titled Formative Evaluation of Formative Evaluation. He suggests a systemic approach to the whole notion of formative evaluation and, to use his own terms, says;

> "Emphasis has been on instructional design and development. However, it seems to me that the concept is far too useful, and far too important to limit it to instructional materials or even instructional matters alone." (Caufman, 1980 p. 2)

He further argues that although instructional media materials are commonly perceived as the major factor that counts for effective learning, there are certainly other variables necessary for learning to take place, and they require equal attention.

Let us consider, for example, the school structure and environment. A school is a socially defined intervention and so are the courses and coursewares, all of which should be evaluated as a whole rather than as separate entities. Good materials in a poor environment may have just as poor an impact as unevaluated material, and vice versa. To be more wholistic, as the statement proposes, formative evaluation should establish (in every respect) the effectiveness of every sub-system within the supra system and suggest modifications of the material as appropriate.

2.3.6 Formative Evaluation Budget

The formative evaluation involved expenditures beyond that of the material production cost summarized in Table I. Table 2 summarizes the costs of formative evaluation work and the production of this report (thesis-equivalent).

In its broadest terms, this thesis-equivalent concerns the application of local resources to develop media materials and at the same time adhere to accepted procedures in material development processes. It attempts to encompass peoples' experiences, as discussed in the review of literature. Its effects

TABLE 2

FORMATIVE EVALUATION BUDGET

NO	ITEM	UNIT/COST	TOTAL COST
1.	Production of instruments 50	@ $0.50	$ 50. 00
2.	Postage to/from Tanzania.	_	$ 50. 00
3.	Data processing costs.	_	$ 50. 00
4.	Report (thesis production/binding.	10 copies.	$ 350. 00
TOTAL EST. COSTS.			$.500. 00

as anticipated, will have both an immediate and a long term impact on the various bodies in the education sector. Its beneficiaries are analyzed in section 2.4 below.

2.4 Project beneficiaries

The programme development and its formative evaluation processes will benefit both individuals and educational bodies responsible for certain roles in the educational sector in Tanzania. Immediate beneficiaries of the programme include;

i. The producer and evaluator, for the designing and the practical formative evaluation experience gained.

ii. The Teachers in Tanzania, whose media production skills will improve as a function of that programme.

iii. Audio/Visual media instructors in teachers colleges as well as teacher trainees, whose media resources will gradually expand.

iv. The Faculty of Education at the University of Dar es salaam in the same manner as no. 3 above.

v. The Institute of Curriculum Development, for the ideas of instructional materials development procedure as demonstrated in this document.

vi. The entire nation, whose economy will benefit from savings in foreign exchange, and , in turn, ignite future hope for self-sufficiency for school materials.

vii. Parents, whose children will benefit from good quality education.

The above literature review was a primary guide to the present project procedures, but both time and space constraints against desired situations had, to a large extent, an impact in the selection of appropriate evaluation procedures. We now turn to the methods applied in the formative evaluation process for this thesis-equivalent project.

CHAPTER III

METHODOLOGY

3.1 Evaluation Design

The Formative evaluation design used in this study combines aspects of models developed by authors in the field of Formative Evaluation, such as Sanders and Cunningham (1973), Weston (1986), Ardaway (1983), and Baggaley (1986) (as discussed in the review of literature in Chapter Two). In these models, a "needs assessment" was pointed out as the initial component in the material development cycle. Its role is to assess the extent to which the proposed material is required by the target audience.

This thesis equivalent followed those lines. The idea of this project originated from the results of a pilot study conducted in a sample of five (5) schools in Morogoro (Tanzania) to elicit teachers' needs in the area of instructional media in a Tanzanian context. The objectives of the study were three-fold. Firstly, it investigated the situation of instructional media materials in schools at that time, and the teachers' reactions to the prevailing situation. Secondly, it elicited teachers opinions on the role that the schools' authorities play regarding instructional media, in order to compare the optimum with the actual. Thirdly, it investigated the situation of material/information dissemination as well as gathering ideas as to how this situation may be

improved. This constituted what Sanders and Cunningham described as "pre-developmental activities".

As Ardaway noted, "the time constraints imposed by corporate deadlines often means that low priority is given to the evaluation process" (Ardaway, 1983 p. 33). In turn, he suggested a time-saving model for formative evaluation that combines pilot or small group testing and field-testing into a single, on-site activity. In his model, a working draft of material is administered to the target group sample under actual field conditions. On the same grounds, relevant to situation and time variables, a simple one-shot posttest-design was used for this study.

Other scientific designs with better controls for internal and external validity might have provided more "scientific" results than the above, but it was deemed inappropriate for this particular study for two basic reasons. On the one hand, the objectives of the material evaluated, as stated, were to develop some hand-on skills of which only a part (if any) could be measured by referenced test items as knowledge gained. An ideal test could have been a practical demonstration by the learner that would, in turn, be assessed by the evaluator. On the other hand, the topic and the media used were new to most (if not all) subjects, so that testing their background knowledge by a pre-test would have been unrealistic and misleading.

The evaluation procedure consisted of three phases. The First phase involved a review by the Subject Matter Experts (SMEs). Three SMEs (explained in the "Instrument" section) viewed the draft-edited video programme and provided their opinions, based on the open ended questions guide (see Appendix I). The programme was finally field-tested with a sample target audience in Tanzania.

Time-frame and distance variables could not be overlooked. First, as already stated in the review of literature, materials developed for a particular group can only be tested for their effectiveness using that particular target group or its representative, but not otherwise. This video programme was developed for teachers in Tanzania and therefore, although developed in Canada, it was field-tested in Tanzania. Secondly, this is a partial fulfillment of a time-limited programme which would not have allowed for a second field-testing (summative feedback), which would be the ideal after the final revision. The same constraints ruled out such possibilities as repeated measures tests, and the ability for the evaluator to record observations of the subjects' practical applications of the video's theoretical demonstrations. Instead, the emphasis was placed on assessing subjects' attitudes regarding the quality and effect of the programme approach, rather than measuring cognitive effects. On that background, a simple, inexpensive study design (described above) was thought appropriate.

3.1.1 Developmental stage

Both the storyboard and the footage were informally evaluated by peer and experts (SME1) and the drafts revised as appropriate. The data for that component of the evaluation was only reported, but not included in this document. What was reported, however, was the formal evaluation done after "draft editing". Draft editing here means that the material was by no means complete at the time of formative evaluation, but only a proposed format to be tried-out with the target audience for approval. Thus, this study did not include summative evaluation, which focuses more on the cognitive effects of a finished product, but rather, it queried peoples' likes and/or dislikes of the media material format and approach.

3.1.2 Sample & Sampling procedure

The target audience for this programme, as stated, comprised of teachers serving in the field of education in Tanzania. The audience also included teacher trainees in teachers' colleges who, upon graduation, would join the teaching force of 98,392 and 3,366 teachers in both elementary and secondary schools respectively (1990 statistics). Given the time limit, reaching all the teachers in the entire country was unthinkable. In turn, a representative sample was thought ideal for the study.

Considering time constraints against accessibility, "mature age entry" students attending undergraduate studies (BA with Education) at the University of Dar es Salaam were used as

subjects. These students were considered to be a true representative sample of the target audience on the following grounds:

i. Firstly, mature age (education) students are experienced teachers who have worked in the field of education and are at a point where they have decided to enroll in undergraduate studies in hopes of attaining a university degree.

ii. Secondly, they constitute a fair representation of both groups of teachers from Elementary and Secondary schools from almost all the Regional (Provincial) schools.

iii. Thirdly, they have both experienced the shortage in question and hopefully have contemplated alternatives.

iv. Fourthly, as university students they were expected to be more open to opinions and more critical of situations, especially those pertaining to their careers.

Fifty (50) out of 78 teachers (from different school levels), pursuing undergraduate studies under mature age entry, (1st. year at the time of the study) at the University of Dar es Salaam were assigned to a single study group. Participation was voluntary (a

random sampling procedure was unnecessary for this particular study).

3.2 Instrumentation

3.2.1 Questionnaire

The formal data collection was based on a questionnaire which employed an "Agreement Scale" adopted from Henerson, M.E.; Morris, L.L. & Fitz-Gibbon (1987). The questionnaire comprised of 3 parts. Part One requested demographic information. Part Two, which addressed the video production variables, contained two sub-sets of a series of attitude statements to elicit respondents' opinions about the video programme. In the first sub-set, respondents were asked to rate their feelings by placing an X on one of the five line-segments provided between each pair of adjectives. Statements were semantic differentials with five opinion levels. Random polarity was provided to avoid response bias-negative and positive statements were alternated, but negatives were reversed at the analysis and reporting stage. (It may be noted here that, in a pilot test, random polarity of scales was not built into the questionnaire design. However, the statistical analysis showed no significant difference between the use and non-use of random polarity scales). At the data analysis stage, statements were re-coded from 1 - 5 ('1' for negative and '5' for positive), as illustrated in the example below.

Example:

Place an X on one of the five line-segments between the descriptive pairs which best describes your feelings about the video you have just viewed.

	1	2	3	4	5	
Video: Interesting	___	___	___	___	___	boring
Narration: inaudible	___	___	___	___	___	audible

The second sub-set constituted 15 extreme statements, either clearly favourable or clearly unfavourable, as in the following example:

Check in the box which best corresponds to your own judgement of the video which you have just viewed.

I had problems with following the narration.

SA	A	U	D	SD
strongly agree	agree	undecided	disagree	strongly disagree
☐	☐	☐	☐	☐

Part Three contained a self-evaluation 10 point scale to assess the rate of subjects' understanding of the three methods demonstrated in the video. Self-evaluation as a technique was selected with the understanding that the subjects are experienced teachers expected to have conducted self-evaluation at some point in their careers. Subjects were required to rate (on the ten point scale) the extent to which they felt they understood each demonstration. (Methods 1, 2, & 3). A copy of the

questionnaire (completed with summary data of frequency counts) is attached in Appendix II.

Dr. Mahenge, the Instructor for Instructional Media Education studies at the University of Dar es salaam, became quite willing to administer the evaluation on behalf of the author. (He was approached by the author for assistance in August,1991).

3.2.2 Subject Matter Experts.

The literature review of formative evaluation has shown that the "Subject Matter Experts' (SME) variable has continually been a major source of data to determine modification of instructional media materials. (See, for example, Dick & Carey, 1985; Gagne & Briggs, 1979). SMEs are known for their precise ability to point out technical errors which cannot otherwise be detected by less qualified personnel. For the purposes of this thesis-equivalent and to ascertain a balanced assessment of the technical, pedagogical as well as aesthetic qualities, three SMEs, carefully chosen on their own merits, viewed the programme and provided feedback (as reported in the results).

3.2.2.1 *SME1*

The first SME. was Mr. D. Wells of the Department of Educational Technology, Concordia University . As an instructor in the planning and producing of Audio Visual programmes, Wells has demonstrated expertise in the production of state-of-the-art video programmes. His role was to evaluate and provide feedback

on the technical accuracy of the programme (a role which exceeded the ability of the target audience).

As a Canadian, however, the first SME lacks familiarity with the target audience and the school curriculum for which the programme was intended. Entrusting him with the assessment of the level of complexity and relevance of the programme in the Tanzanian context would have been inappropriate. Thus, that aspect was entrusted to a second subject matter expert, Professor E. Jengo.

3.2.2.2 *SME2*

Professor E. Jengo is an experienced instructional media educator within the Tanzanian context and for over twenty years he has offered Audio Visual courses at the University of Dar es salaam, as well as to serving teachers in Tanzania. His major concern over the years has been the utilization of local resources to meet budgetary constraints. In turn, he was chosen as SME2 to tap into that experience by way of his reactions and recommendations about the current video programme. Professor Jengo viewed the video in Tanzania and mailed his feedback along with the questionnaire to the author in Canada.

3.2.2.3 *SME3*

Last, but not least, is Dr. S. Mahenge, who willingly accepted to administer the study to the sample subjects on behalf of the author. When the one-on-one evaluation component was proposed

the SME3 expressed his doubts based on his time constraints, but instead opted for a group discussion after administering the questionnaire. He coordinated the group discussion, which elicited further information and feelings which he then recorded and reported as a third subject matter expert (SME3).

3.3 Testing Procedure

3.3.1 Scenario

50 undergraduate students (experienced teachers) in the Education programme viewed a 28 minute video programme entitled 'ENLARGING IMAGES' on a 21" Toshiba TV screen. The screening was preceded by a verbal introduction in which participants of the programme were encouraged to take an active role by critically assessing all aspects of the video tape and providing their feedback regarding possible revisions. After viewing the video, there was a debriefing session regarding the questionnaire. Subjects then responded to the questionnaire which elicited their opinions (attitudes) about the quality and relevance of the programme in the Tanzanian context. A section on self-rating for comprehension was also included.

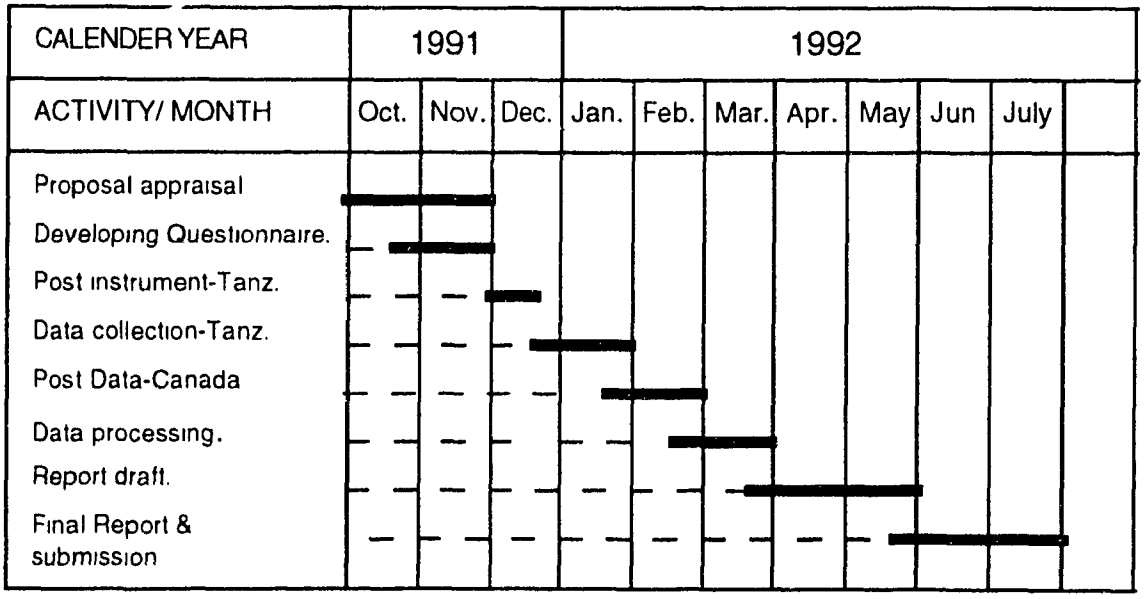
After the questionnaires were collected, there was a group discussion coordinated by the administrator. In the discussion participants expressed more of their views on the programme and gave further recommendations on how to improve the programme. The Administrator took notes, which were reported under the

SME3. In summary, the material development and evaluation cycle was graphically summarized in Figure 6 .

3.3.2 Time-Frame

The time-frame within which the author was to conduct the formative evaluation is summarized in Figure 7. The times alloted for mail to and from Africa (like many other time

Figure 7: *Formative Evaluation Time-Line*



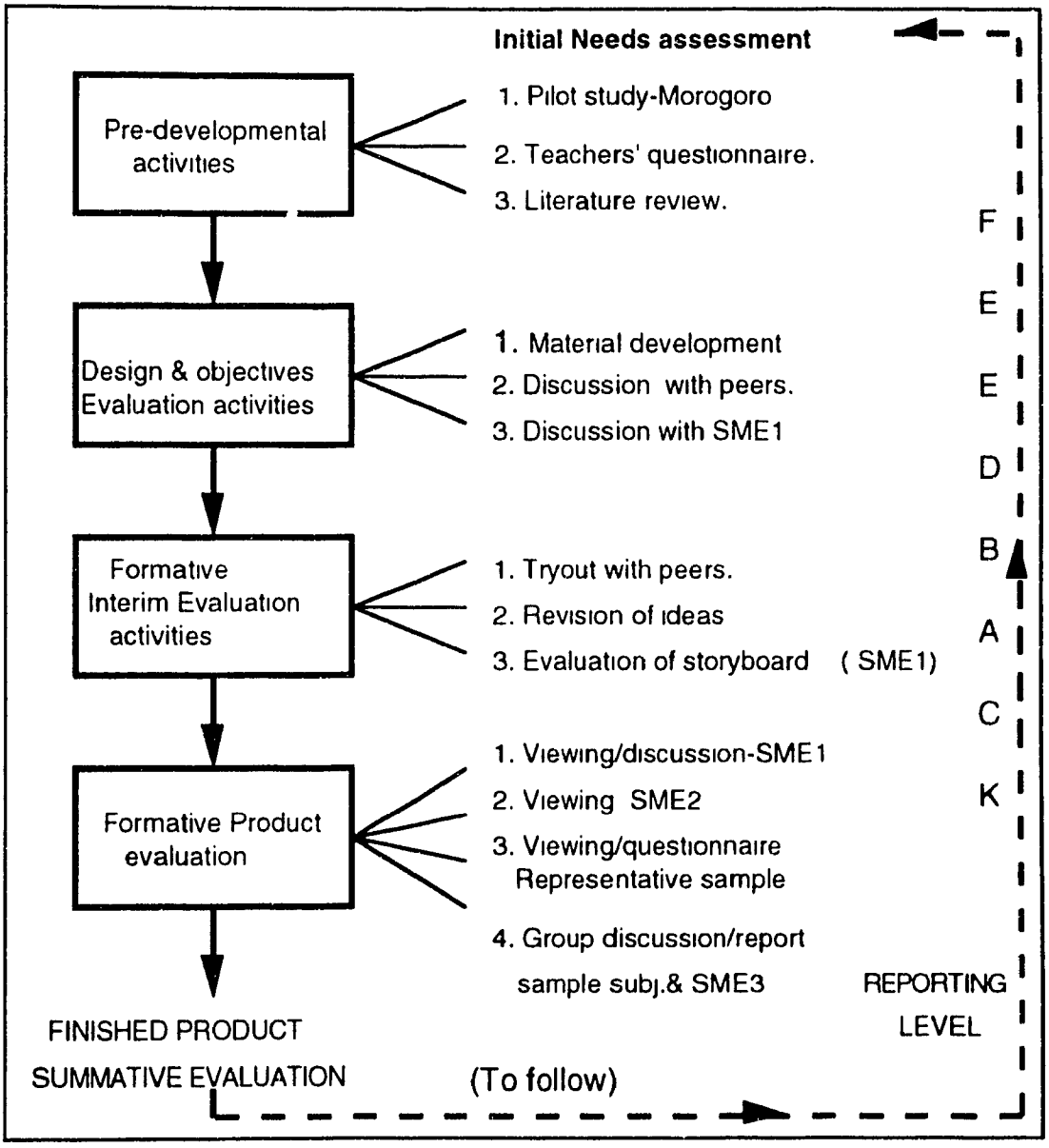
allotments), were estimated. Fortunately, the administration of the study in Dar es salaam was done in time and the completed questionnaires arrived in Canada earlier than scheduled.

3.3.3 Data Analysis

A preliminary descriptive data analysis was performed to assess

the findings, as well as to determine further statistical analysis where necessary. Frequencies, means and standard deviations, where appropriate, were summarized on fresh questionnaires

Figure 6: *Evaluation Design*



attached as Appendices II. Observed findings in the analysis are reported in the RESULTS section of this work.

The frequency distribution for section three (self-rating) split the group into two distinct groups of "high" and "low" categories of subjects' understanding of the three methods of enlarging images (demonstrated in the video). That called for further statistical analysis, and a nonparametric test (the Mann Whitney U Test) was performed to find out whether the two categories (high and low) differed in any of the test items. This helped to identify specific problems, particularly on the narration/language aspects, as reported in the Results chapter which follows.

CHAPTER IV

RESULTS

This chapter summarizes key results of the study through the use of tables, graphs and charts accompanied by written descriptions. For convenience, the reporting is done in two sections. Section One provides the feedback of the "Subject Matter Experts"(SME), while Section Two provides target audience responses.

4.1 Subject Matter Experts' Report

Three Subject Matter Experts (SMEs) viewed the video programme and provided feedback. Modalities for their selection were discussed earlier in Chapter Two: (methodology). For convenience, in the reporting, they will be referred to as SME1, SME2 & SME3.

4.1.1 SME1

After viewing the video programme (with the producer), SME1 made valuable responses regarding its overall quality. Emphasis was placed on format, picture composition, lighting and editing. SME1's responses can be summarized as follows;

4.1.1.1 *Lighting*

Despite the additional lighting in the demonstration room, images in the introductory part of the video were poorly lit and thus

lacked facial details. SME1 noted that, while we tend to compensate for details on dark objects even when our eyes do not see them, the camera lacks such features, thus providing only outlines of contrasting objects against bright backgrounds. He diagnosed the problem as a function of that contrast: in this case, two black students against a white wall background. According to him, contrast reduction and compensation was beyond the ability of the camera features and could only be achieved by either fading the dominant background or further illuminating the objects. The latter was not possible without casting shadows on the background, and so the former will be adopted in the modification stage.

4.1.1.2 *Picture composition*

This is a process of arranging or organizing objects within a framed background to form an appealing image. Its appeal is dependent upon, among other factors, careful selection and arrangement of objects to be included, picture ratio within the frame and the colour of both the objects and the background against which those objects are displayed. The SME1 also pointed out some aspects of the picture composition and framing that could be improved. He noted, for example, crooked edges and camera jacks in a few frames, which could have been avoided.

4.1.1.3 *Editing*

The programme editing allowed some noticeable jump-cuts and a blank frame. A jump-cut may be explained as an effect resulting

from having similar subjects in two adjacent shots without proper alignment at the editing stage. Blank frames, on the other hand, are technical editing flaws whereby two clips are separated by a blank space on the video tape. Thus, the sudden transformation from the first frame to the next disturbs the viewers' eyes in the play back stage. Such effects, it is noted, disturb visual and mental concentration, consequently hampering the learning process.

4.1.1.4 *Format*

The SME1 commended the use of video to impart the skills in question, but also outlined areas within the video itself which needed improvement. For the introduction he recommended that a long shot to establish the topic, followed by zooming in to a particular picture and panning across the rest of the picture display, would have made the introduction more appealing. Where the teacher identifies a picture and draws the attention of her peer, the audience should be made to join the teachers and admire the picture by a closer shot or zoom-in to the identified picture. A similar effect would improve the scene where the teacher attempts to enlarge the picture.

A full close-up to the knots on the rubber band would help the viewers to understand the process more fully. The absence of such details by camera effects, he conjectured, makes comprehension of the first two methods of enlarging images problematic to moderate viewers.

The SME1 liked the demonstration procedure, but felt that too much time was devoted to the demonstration of shading techniques. Rather than detail the entire shading process, the SME1 suggested that a brief introduction, followed by a finished clip to show the finished product, would have been more effective. In addition, this change would also reduce the video to about half of its running time.

Voice was another aspect well commented on by the SME1. He had no problem with the background music (other than copyright considerations), but he noted a general voice-over volume fluctuation (intended or otherwise), and a disturbing gap of silence between the introductory dialogue and the voice-over. The video summary which reviewed the sub-topics covered in the programme impressed the SME1, but he again recommended the inclusion of the advantages versus disadvantages of each method (if any) which, according to him, would help to give clues regarding selection criteria.

4.1.2 SME.2

The second subject matter expert viewed the video and provided his feedback on content accuracy, degree of complexity, and the extent to which the programme addresses the Tanzanian situation. Regarding the accuracy of the content, the SME commends the approach employed and approves of the organization and presentation procedure of the content.

In contrast to the content, however, the SME wasn't very impressed by the picture quality of the introductory part. Like the first SME, SME2 noted inferior lighting, making it difficult to obtain details of characters' images. In turn, according to him, this situation deprives the viewers of an established rationale for the demonstrations. Main lights, he noted, could have made these images clearer and recognizable. He went on to suggest that sharper close-ups would help to clarify some small, but important details, like the knots shown when joining the three rubber bands.

The question of relevance involved examining several variables, such as access to video equipment, language issues, and immediate practice after the show. While the SME supports the relevance of the programme, especially in teachers' colleges, he seemed to have reservations about easy access to video facilities in Tanzanian schools at this time. He commented, too, that although the language used in the narration is simple and straight forward, the use of Kiswahili and an immediate opportunity to practice would help the viewers better internalize the demonstrated skills. The SME2 concludes his remarks by recommending that the programme should not have been directed to teachers only, since it would also benefit graphic artists and other individuals who are involved in the production and application of visual arts.

4.1.3 SME.3

The third SME was the administrator of the formative evaluation study at the host university on behalf of the author. After viewing and completing the questionnaire, the administrator was to initiate a summary discussion which would provide further reactions and recommendations from the audience.

The discussion raised very important observations, some of which were similar to those observed by the first SME. The first observation involved the background music. According to the observers, at certain points the background music competed with the voice of the narrator, thus becoming more of a distraction than a special effect. Similar comments were raised by the first SME and a few sample subjects, but did not strike the second SME. The session also observed an obvious gap between the introduction of the video and the actual presentation which, in turn, breaks the linkage between the two sections and subsequently distracts consistency. It was also noted that the volume of the narrator's voice was inconsistent, thus disrupting the flow of information in some segments. This situation, they conjectured, might affect comprehension.

On the positive side, however, in his concluding remarks, the SME3 commends the programme's approach and, in fact, included it in his course programme with immediate effect. He went on to recommend that more programmes featuring media production and

application should be produced and made available as supplementary resources to needy audiences.

4.2 Data Analysis

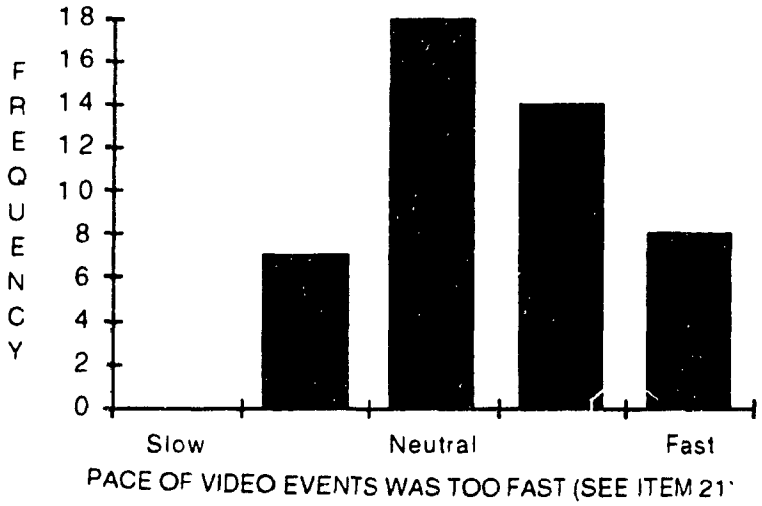
A descriptive data analysis was performed, and the frequency counts were summarized on a blank questionnaire, attached as Appendix II. Fifty experienced elementary and secondary school teachers, currently pursuing undergraduate studies in education (first year) at the University of Dar es Salaam (Tanzania), participated in the evaluation. Female teachers constituted 24% (12) while male teachers constituted the remaining three-quarters (38/76%). Their ages groups ranged between 20 to 40 years. Only three participants were above 40 years. The rest were: eight (8) teachers between 20-25 years;19 were between 26-30; 12 were between 31-35 and eight (8) were between 36-40. The majority (33 or 66%) have had above five years of teaching experience while 17 (44%) were in their first five (5) years of teaching. Apparently, only 14 participants indicated that they had attended an Audio-Visual course in their pre-service training, and only 2 had done Fine Art, as a subject, at their secondary school level.

4.3 Results

The first twenty questions elicited respondents' opinions about the form and content of the video programme. A summary of responses is provided in Table 3. Generally, the video was judged as both interesting and motivational, with means of 4.54 and

4.57, respectively .on a 5 point scale. Although the average picture quality and sequence was rated high with a mean of 4.04, the speed of events was rated comparatively low at a mean of 3.38. Only 18 (36%) of the total sample considered the speed of events as moderate, against 44% who judged it as too fast (Figure 8), while the remaining 20% perceived it as too slow.

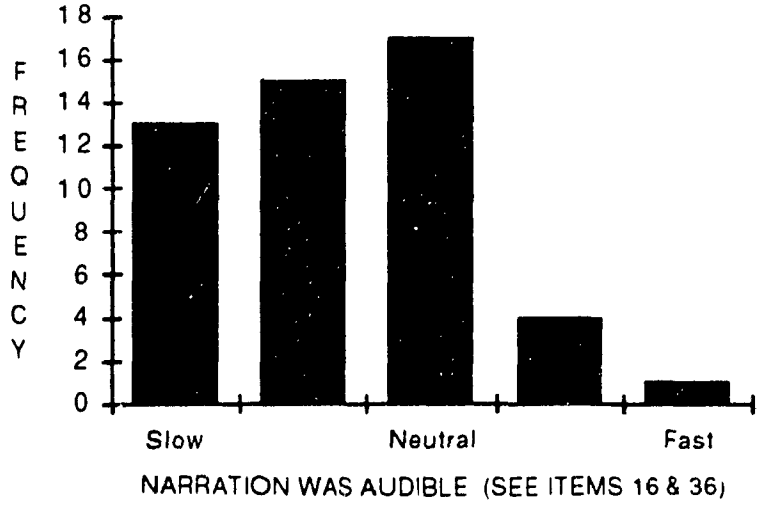
Figure 8: *Pace of the Video Events*



The video package was considered to offer a comprehensive treatment of the methods outlined (mean: 3.85), but it revealed a substantial degree of variability regarding narration and audio components. 34% (17 subjects) of the total respondents were neutral, while 56% (28 subjects) said that the speed of narration was slow. Only 5 subjects constituting 10% of the total subjects considered the narration as being very fast (Figure 9).

This, however, contradicts with their rating of the "instructional clarity" item, at a mean score as high as 4.1 in 5 point scale. Further observations revealing significant differences in language proficiency between ages and teaching experience are discussed later in the section. A similar contradiction is featured in judging the amount of information contained in the video. A summary of findings (Table 3) shows that, although the majority (56%) of the respondents found the information content just right, 8 (16%) of the sample found it to be too much, and as many as 12 (24%) remained neutral. There was an almost unanimous support in the response that the programme tried to do too much. Individual subjects recommended separate treatment of each method, as we shall see later.

Figure 9: *Speed and Volume of Narration*



The embedded assignments were disapproved of by 11 (22%) respondents against 33 (66%) who considered them as a

professionally enriching feature attempting to incorporate viewers into the programme actively The assignments required the viewers to manipulate the equipment and try other approaches that would lead to similar results as those demonstrated in the video.

TABLE 3

SEMANTIC DIFFERENTIAL STATEMENT RESPONSES

SEMANTIC DIFF. NO.	STATEMENT	FREQUENCY 1	2	3	4	5	MEAN	SD
7.*	Interesting	0	0	1	21	28	4.540	.54?
8.	Motivational	0	2	0	15	32	4.571	.707
9.	Entertaining	0	1	2	24	23	4.429	.577
10.	Too fast	2	7	18	14	8	3.388	1.057
11.	Attention	4	2	5	14	23	4.042	1.237
12.	Useful	0	0	4	13	33	4.580	.642
13.	Informative	0	3	1	17	26	4.404	.825
14.	Professional	0	2	3	19	25	4.367	.782
15.	Relevant	1	1	3	11	33	4.510	.869
16.	Audible	2	2	5	22	18	4.061	1.008
17	Clear inst.	3	3	5	22	17	3.940	1.114
18.	Right amount	5	3	12	13	15	3.625	1.282
19.	Understandable	3	2	7	23	15	3.900	1.074
20.	Clear pictures	3	2	4	22	19	4.040	1.087
21.	Pacing fast	2	3	17	20	7	3.551	.959
22.	Dialogue aud.	2	5	7	20	16	3.860	1.102
23.	Narration	1	4	17	15	13	3.700	1.015
24.	Accurate info.	1	3	6	20	20	4.100	.974
25.	Comprehensive.	4	2	5	22	14	3.851	1.161
26.	Demo. prof	2	0	2	17	29	4.420	.906

* 1- 6 are demographic information items

The second part of the questionnaire searched for further information about the video content and individual opinions about its applicability in a teaching context within a Tanzanian environment. Responses for this section are summarized in

content. An average of 80% (79.6) admitted that the video had given them a first hand insight into the demonstrated skills at a mean of 3.98 in a 5 point scale.

TABLE 4

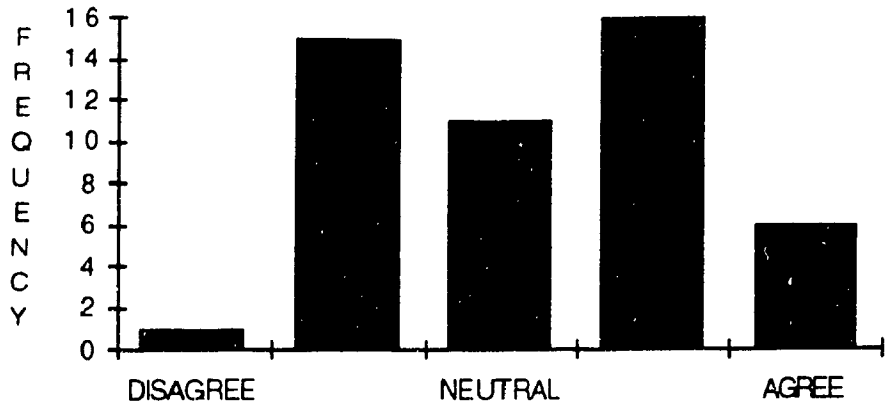
EXTREME STATEMENT RESPONSES

NO.	EXTREME STATEMENTS	HIGHLY(disagr)	SLIGHTLY	NEITHER	SLIGHTLY	HIGHLY (agree)	MEAN	SD
27.	Insights	2	4	0	22	20	3.98	1.270
28.	Segments	1	15	11	10	6	3.16	1.167
29	Introduction	2	4	4	24	16	3.95	1.049
30.	Redundant	12	14	9	8	7	2.68	1.377
31.	Methods-comp.	2	2	2	31	13	4.02	.915
32.	Separate	3	3	4	12	28	4.18	1.190
33.	New ideas	1	1	0	17	31	4.52	.789
34.	Indepth treat.	1	2	4	12	31	4.40	.948
35.	Confirmation	19	8	3	11	7	2.46	1.606
36.	Prob.-Narration	12	12	8	13	5	2.74	1.352
37.	Appl.-Tanzania	9	12	2	18	9	3.02	1.479
38.	Dragged out	16	9	13	5	5	2.36	1.396
39.	Assignments	5	6	6	17	16	3.66	1.319
40.	over-doing	7	10	4	20	9	3.28	1.356
41.	Summary	5	10	3	19	13	3.50	1.344

The lengths of individual segments were further assessed, and the results indicated a persistence of diversity, as noted earlier. 32% of the total respondents regarded the segments of the video as fairly lengthy, while 22 respondents (44%) regarded them as being too short (Figure 10). The rest (22%) were neutral and one case was missing.

them as being too short (Figure 10). The rest (22%) were neutral and one case was missing.

Figure 10: *Length of the Video Segments*



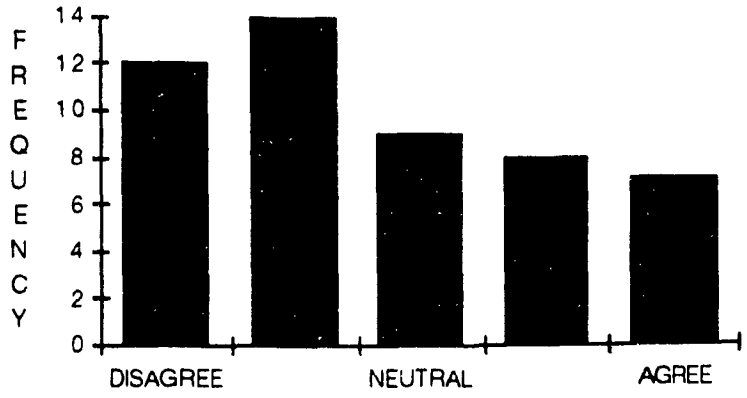
VIDEO SEGMENTS WERE TOO SHORT (SEE ITEM 28)

The findings revealed a significant redundancy of information (Figure 11), which tallies with the first SME's comments reported above. Regarding its applicability, observations indicated some doubts expressed by respondents who considered the programme inapplicable in Tanzania. Some of their doubts could be associated with the limited access to video facilities pointed out in Chapter I, and discussed in detail in Chapter IV.

Part three of the questionnaire required the respondents to judge their personal understanding of the demonstrations using a 10 point scale. A summary of responses (self-ratings) for that section is provided in Table 5. While results show a clear understanding of method 3 (using an overhead projector for enlarging images), mean of 8.51 on a 10 point scale, there were

relatively low means in the other two methods at means of 5.32 and 4.92 respectively.

Figure 11: *Information redundancy*



SOME INFORMATION WAS REDUNDANT (SEE ITEM 30)

That relationship of results called for further statistical analysis, to be discussed later in this chapter.

Table 6 provides a summary of an overall assessment of the video programme. Test items related to either of the seven variables described in the table were grouped together, and a mean and standard deviation calculated to find an overall judgement regarding the production variable of the video programme. On the whole, the assessment was positive. The picture quality aspect was rated the highest, which could have contributed to problems discussed in Chapter V. Although some respondents indicated doubts about its applicability in the Tanzanian context (hopefully

when considering the budgetary constraints), on the contrary the rating for that test item was relatively high (4.03).

TABLE 5

SELF-ASSESSMENT OF UNDERSTANDING

No.	ITEM	1 (-)	2	3	4	5	6	7	8	9	10 (+)	MEAN	SD
42	Method 1	7	2	4	5	9	4	7	5	5	2	5.32	2.664
43	Method 2	6	3	3	8	9	7	5	3	3	2	4.92	2.552
44	Method 3	1	0	0	2	2	2	2	7	14	19	8.51	1.970
45	Relevance	8	6	6	9	7	4	2	1	1	3	4.32	2.559

The comparison of the three methods in chart 5 shows that there is a very wide distribution of respondents' self-judgements regarding understanding of the first two methods. This distribution revealed two distinct groups of "high" and "low"

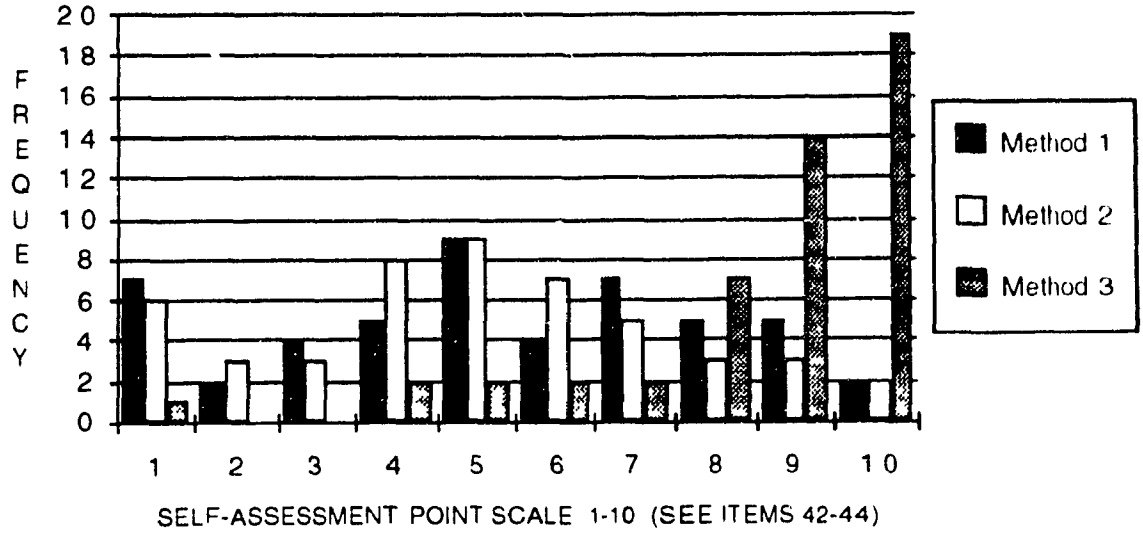
TABLE 6

OVERALL ASSESSMENT OF THE VIDEO PROGRAMME

NO.	DESCRIPTION	OVERALL MEAN	SD
1.	Picture quality & motivation	4.324	0.830
2.	Sequence & Pacing	3.474	1.119
3.	Narration & Audibility	3.761	1.107
4.	Information Accuracy	4.152	1.032
5.	Knowledge/Comprehension	3.790	1.140
6.	Professionalism	3.931	1.090
7.	Applicability (in Tanzania)	4.033	0.996

levels of understanding, while the last method's distribution produced a positive skewed effect. This prompted further analysis, and a nonparametric test (Mann Whitney U-test) was performed to find out if there were differences between the two levels in relation to their general responses to each evaluation item. Ratings between 1-5 were corded as 'low' and 6-10 as 'high'.

Figure 12: *Comparison of Understanding the three Demonstrated Methods*



Cross-tabulation for method one, 'enlarging images using a rubber band', against the two levels of low and high in the new variable revealed that, twelve times in a hundred, the two groups were statistically different at $p<.05$.

It is again interesting to note that items which were statistically different essentially addressed the narration/audio

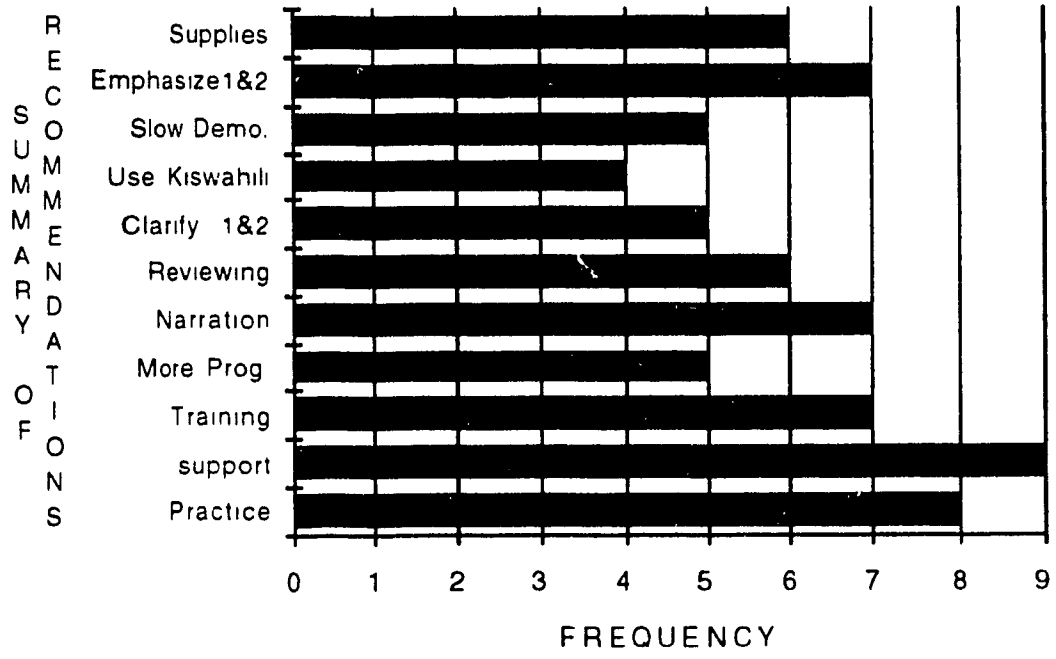
feature of the video. Further tabulation, using age, field experience and sex variables showed no significant differences, but "initial training in Audio Visual courses" revealed that teachers who had attended such courses understood the video better than those who had not ($p < .05$.).

At the end of the questionnaire, a space was provided for respondents to make general comments about anything that was not fully covered in the questionnaire. 39 (78%) respondents made invaluable comments and recommendations. The frequency of recommended ideas is represented in Figure 13 (items being randomly arranged). The variable axis in the figure provides a summary of the comments and recommendations made by the subjects. Only the first item in the list was negative, where subjects questioned the situation of supplies of video equipment and software as a learning tool in schools. The rest were positive statements of recommending how to improve the programme. Nine (9) people commended the programme, and in fact recommended further production of similar video programmes to help teachers in the area of audio-visual education. Recommendations for in-service teacher training in producing and applying media materials was re-emphasized.

In the evaluation the programme was criticized for not providing re-viewing and immediate practice of the demonstrated skills. If the programme was to achieve its maximum objectives, the respondents noted, there should have been time and facilities to

enable for immediate practice that would, in turn, give participants first hand experience of the demonstrated skills. The question of narration seemed to have been a burning issue, supported by a suggestion that the use of Kiswahili language

Figure 13: *Frequency of Comments/Recommendations*



should be considered if the programme is to benefit elementary school teachers. Undoubtedly, as the results indicate, the last method was the easiest, but interestingly enough, the first two methods were considered superior, perhaps because of their feasibility almost everywhere in the country (even where electricity is still lacking). Thus, it was repeatedly recommended that the first two methods be emphasized more than the latter.

CHAPTER V

DISCUSSION

In the following pages, implications of the results reported in Chapter IV are examined. Financial constraints are considered to be the main cause of the current shortage of instructional materials, and a search for an alternative strategy (which was the theme of this thesis-equivalent) is advocated. The scope and limitations of the study design, and subsequent threats to both internal and external validity, are examined prior to the recommendations offered for revisions of the video programme. Finally, summative evaluation after the revision stage is recommended.

5.1. The video format

The high rating of the video quality from the respondents and the subsequent responses from the subject matter experts (as reported in the Results section) may be satisfying, but not necessarily exciting. Perhaps the respondents, upon viewing the video, rated it highly because of its being the only alternative against the boring lecture methods at the university. The aspect of "interest and motivation" in the programme, for example, were rated as high as 4.5 on a 5 point scale. This may not be very surprising, considering the fact that respondents (as defined) have had limited exposure to the moving images medium being used as an instructional tool (Notice that plans for a TV facilities

in Tanzania mainland are only underway, and not likely to operate until the second half of 1993 or early 1994. In Zanzibar, however, there are TV programmes, but they run for only a few hours in the evening.)

It could also be argued that the high rating of the technical aspect of the video (the highest in Table 6) may have been over-amplified by the fact that the subjects had no expertise in video production and therefore were unable to critically assess the technical aspect of the programme. Assessing a technical aspect of a product can only be effective if the assessors have a technical "know-how" of the production theory and practice of the material being evaluated. For example, 18 respondents showed that they would not care if the programme events were presented faster or slower than was the case (Table 3) and 70% of the same people were neutral in judging the video's pacing "too fast". The same people constituted about half of those who indicated difficulties in the "comprehension" test item. That was enough evidence that the subjects lacked knowledge of what aspects to consider when assessing the technical quality of an instructional package.

When Chu and Schramm (1967) were addressing the issue of educational TV research they noted similar weaknesses when they said "...perhaps the only consistent findings in the body of research on instructional television is that television can teach". Certainly there are other variables that need to be examined

when addressing such complex processes. The "form" of the instructional material, which naturally constitutes the technical aspect of the product and certainly the "vehicle" of the message, has to be explored (as advocated by Chu and Schramm) when a formative evaluation of a product is made, because of the fact that it is on the basis upon which the material can be modified.

Motivation was also rated high (mean: 4.6). Similar reasons detailed above could have attributed to such a high rating. Thus, the ratings for an instructional media format used in instructions for the first time may have a "ceiling-effect", and may not be generalizable. It should be re-emphasized here that learners are the best judges of their own programmes. What the designers may consider "good" for the learners may, to the designers' surprise, be disliked, and vise-versa. Thus "quality" is a relative term dependent of the learners' tastes. When they, as judges, rate it high, they have judged right, and is certainly what is useful for them.

To some respondents, however, the programme seemed to have been a useful tool, not because of a new experience, but because they felt that it provided what they wanted-skills to counter their daily problems in the area of media production and applications for effective teaching. This was illustrated by their rating regarding how useful the programme would be in the Tanzanian context (mean: 4.58). A similar rating of a mean of 4.4

was recorded in relation to the "informative" aspect of the programme.

The feedback from the subject matter experts was very instrumental in the this exercise. Unlike the sample subjects, SMEs had more media production skills, which facilitated a more critical overview of the technical variables of the programme. While the sample subjects' responses were undoubtedly very useful in determining revision alternatives regarding its contents, the feedback from SMEs was more directed towards the revision of both content and form of the material The sample subjects responses, however, have had a significant role in the approval of the programmes' suitability to the target audience and the objectives for which it was designed. In addition, it is more likely that their responses in the final field-tryout will certainly be superior to those of the SMEs.

5.2 Generalizability

This formative evaluation exercise encountered a number of constraints which may limit its generalizability, but its advantages, based on its simplicity cannot be ignored. According to Campbell & Stanley (1966), results of an experiment can only be generalizable if they answer to questions of external validity. The authors contend that "internal validity is the basic minimum without which, any experiment is not interpretable" (p.5). It addresses to questions like: Did the experiment's treatment really make a difference in this specific experimental instance?

It also questions the selection of designs, samples and experimental procedures Based on the nature and objectives of the evaluation, some of these constraints have been justified as follows:

5. 2.1 The design

Boring (1954) and Stouffer (1949), cited in Campbell & Stanley (1963), have pointed out that the "one shot posttest design has a total absence of control, and bears the least scientific value because it lacks a control group. However, the current author argues that, based on the the nature and objectives of this study, a control group might not have been of relevance to its formative evaluation needs, especially when the study only attempted to gather subjects' opinions regarding a draft material rather than its content effects. In that respect, the author did not consider it appropriate to have a control group, nor did he consider it proper to use random sampling procedures in selecting sample subjects.

The factors that led to non-use of a pre-test were examined in the Design section. In addition to those factors , "students taking a test for a second time, or taking an alternative form of the test, usually do better than those taking the test for the first time" (Campbell & Stanley 1966 p.9). Probably the testing effect in an instance where the content of the treatment is beyond the subjects' experience (as was the case in this instance) requires a separate study, but was again inapplicable in this context.

5.2.2 Retention

The posttest measure in the evaluation was used only once- immediately after the treatment. Results of such testing cannot be generalized over a long time memory. As recommended in the conclusion, the revised version of the programme would be field re-tested with an immediate demonstration of skills gained as a result of the treatment. A repeated testing to record retention or loss of those skills would be very appropriate. For this particular instance, however, respondents were only required to note alternative ways of performing certain tasks as well as giving their opinion regarding its utility and motivational values.

Although the evaluation in question has suffered these constraints beyond the evaluator's control, the results have been very encouraging and, in turn, have provided appropriate feedback data which the author has used to determine areas of revision, as recommended in the final chapter.

CHAPTER VI

RECOMMENDATIONS FOR REVISION

In the following section, the formative evaluation feedback data obtained from both the Subject Matter Experts and the sample's subjects, are used as a basis for the recommendations of revisions to improve the formatively evaluated programme. For convenience, technical and cognitive variables are used to draw up some deliberations. Essentially, the technical aspect occupies the most part due to the fact that the evaluation concentrated more on the media format while the content aspect is left for the recommended field-testing after the revisions.

6.1 The Introduction.

The first pictures in the introduction stage of the video were noted by the SMEs to have lacked proper lighting, and for subsequently lacking "facial details". According to SME1, two major reasons might have caused the problem. The first (the SME conjectures), could have been the shiny background (walls). A video camera tends to fail striking the balance of objects against a very bright background, and as a result, the objects appear to be very dark. As discussed in the Results section, trying to better illuminate the objects with direct "main" light would have created shadows onto the background.

The author recommends "re-shooting" the introductory pictures

(a 4 minute clip) for two reasons namely. format and narration (both of which will be discussed fully in the respective sections of the revision recommendations stage). When re-shooting, the author recommends one of the following alternatives;

(a) The first alternative is to use a different room with less reflective walls, preferably of mid-blue, green or mid-grey hues. A strong light bounced on the ceiling should illuminate the objects enough for the video camera to be able to record the image details.

(b) The second alternative (an application which might be difficult to set) is applying wall hangings of the desired colour tone. Should that be opted, the picture display could either be mounted on portable display boards or arranged on long tables placed against the walls.

(c) A video studio is certainly an excellent alternative.

6.2 Involving the viewers

The introduction of the video tended to ignored the viewers. It should have zoomed-in the picture identified by one of the teachers. Due to that omission the viewers seem not to have been involved in the dialogue-deciding to enlarge the picture. In this proposed re-shooting, it is recommended that when the teacher identifies the picture and draws the attention of her peer, a sharp close-up of the identified picture should be used to incorporate

the viewers in order to facilitate their mental participation in the dialogue. A direct cut to a full close-up would be acceptable.

The opening shot could capture more of the viewers' attention and more appealing, if it established the theme (picture display) by a long shot, followed by zooming-in to a particular picture at one end and panning across the display before the first teacher appears. As in the previous version, all the characters should have appeared on camera before attention was drawn to them by their colleague. An addition of a third character would also improve the introduction, especially when considering the realities of a school staff lounge. In this re-shooting, the crooked picture frames reported by the SME1 should be corrected.

5.3 Language and narration.

Narration as a production variable had some flaws as noted by many respondents. Although many subjects claimed that the narration was audible enough, when the question was phrased differently (Q.16 & 36), 18 out of 50 respondents agreed that they had problems following the narration. That could be attributed to two possibilities, both of which are stated in the Sample Section. Responding differently to a question which demands the same information may imply that the respondent did not understand what precisely is required from her/him.

The second, more realistic explanation could be that of limited language proficiency. Although the cross-tabulation did not

reveal any statistical difference between the "more experienced" teachers and the recent graduates of conventional teachers' colleges, a low English language proficiency for elementary school teachers whose medium of instruction is "Kiswahili" (as stated) is likely. This may have hindered their comprehension and understanding of the question statements. It is even a more likely explanation when technical jargons are used. Thus, although terms like "narration" may be familiar to regular English speakers, they may be rare for speakers of English as a second/third language

In his feedback, SME2 strongly recommended the use of "Kiswahili" for the narration of the video programme. This was certainly the author's language choice for the long term plan (see Chapter III), but English was selected for the purposes of this thesis- equivalent because of reasons detailed in the Methodology section. Based on the feedback received from the subject matter experts, and the interest shown by respondents regarding the use of 'Kiswahili", the author recommends that the narration in the revised version be done in "Kiswahili". The implication of this recommendation includes re-filming the introductory part to include the direct dialogue between characters. Dubbing a new narration track onto the revised version of the video tape was in any case necessary, when considering the changes (additions and running time reductions) already recommended above or suggested in the editing section that follows.

6.4 Editing

The above recommendations for the revision of the video programme involve many areas of the whole programme. The recommended additions of picture clips and other revisions on the video tape suggest revisional editing which could best be done from the beginning. The proposed editing would then allow for inclusions of new clips, new introductory pictures, shortening the lengthy clips etc. Designing a new storyboard incorporating the desired changes would be an advantage. It is proposed that the revised version of the video be of at most 20 minutes running time.

6.5 Background music

The background music was supposed to hold viewers' attention throughout the video programme, but without making them lose track of the narration. According to the findings and the subject matter experts' feedback, the background music indicated to have disrupted the mental concentration of the viewers because of its volume. Subsequently, it is recommended that, in the revised version of the video, the volume of the background music should be turned low. It should be mentioned too, that the volume level of the background music should alternate with that of the narration. In other words, whenever the narration voice comes up, the background music should fade away and vice-versa. This would allow for the concentration of the viewers to either of the two audio channels at a time. At the end of each scene, the

background music should also fade away to create an ending effect.

6.6 Splitting the programme

In the data analysis, 40 people from the sample recommended that the three methods should should be treated in separate video tapes (Item 32 of Table 4). After careful considerations of this suggestion, however, the author contends that the present format of the video is still the best. Amongst the considerations were cost factors. The tape running time for a single method would be at most, be ten minutes. Accepting the above proposal of splitting the methods into separate tapes implies having three separate video tapes. Considering the fact that the shortest video tape available is 30 minutes running time, accepting the proposal would mean wasting 60 minutes (20 mins. of each tape) for a single topic of Enlarging Images. It could probably be tolerated for the experimental version, but when re-produced in large quantities for dissemination in schools it would certainly be wasteful. On the other hand, using the available features of video technology, the desire to practice one method at a time can still be accomplished even though all the three methods are recorded on the same tape. The revised version of the programme, therefore, will still bear similar features to the original tape in that respect.

6.7 Revision component

The revision component of the programme, which featured a summary of the main points covered in the video, was found to be very useful by both the SMEs and the sample subjects. But when examining the comments at the end of the questionnaire, they suggest that respondents could benefit more if advantages and disadvantages of each method were also summarized at the end of the programme. The author, therefore, recommends the inclusion of a brief discussion of that contrast. Hopefully, this discussion may serve as a spring board from which the choice of most appropriate method applicable to a particular situations can be made. The summary of the advantages and disadvantages in point form should appear on the screen as they are voiced by the narrator.

6.8 Artistic background

In the statistical analysis, cross-tabulation using "Art Education" as a variable revealed a significant statistical difference between teachers with artistic backgrounds and teachers who had no artistic backgrounds. Although they had almost similar teaching experiences, the latter had more difficulties in following the demonstration than the former. It could, therefore, be recommended that Fine Art and Audio Visual education be included as compulsory subjects in teacher education programmes.

CONCLUSION

The formative evaluation for this package has been very useful. In general, the technical aspect of the programme was adequately examined and the producer has found the feedback from both the sample subjects and the subject matter experts invaluable for revision purposes. As stated earlier, the video programme (as tested in the field) was still at its draft stage, subject to the target audiences' approval. It was a new format to them and making a finished work before seeking their opinion regarding its acceptability, based on situations in a real environment, would have been unrealistic.

The question of distance was discussed in the "testing procedure" stage, which expressed the limitations against the producer's desire to conduct two field-try outs with the target audience. In that respect, the author (also the producer of the programme) has not regarded this formative (interim) evaluation as final. As noted, the study has tested very little of the cognitive aspect, even though it was argued that an attempt to test that component in this particular package was inappropriate. Levels of skills acquired by the learners, as a function of viewing a programme (in this case a video programme), could certainly have been measured by providing opportunities for every sample subject (or representative) to demonstrate the skills while the evaluator observes and assesses the accuracy at which the skills are demonstrated . Not withstanding these limitations, the producer

regards the effects demonstrated by this formative (interim) evaluation an invaluable endeavor, which will certainly be translated into revision of the video programme.

A final field-test of the revised version of the programme is highly recommended. In this test, the subjects should have the opportunity to practice the skills demonstrated in the video, thus allowing the author the opportunity to measure its cognitive effects. In turn, its potential, as a learning tool in Tanzania, should further be explored.

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Appendix I

EVALUATION GUIDELINE
FOR SUBJECT MATTER EXPERTS

The following is a suggestion among many styles that you may use when providing feedback regarding the video programme for teachers in Tanzania. Otherwise, feel free to articulate as much of your opinion beyond the suggested guide-line. Your participation is highly appreciated.

1. Please, comment on the quality of the following:

   - factual correctness of the visuals (pictures & graphics) focus, lighting, camera angles and close-ups.
   - accuracy of the content and procedures.
   - Narration and dialogue - audibility, pace and fluency
   - Pace (speed) at which events are treated and their relatedness.
   - Approach - the way the subject is approached, the introduction, the demonstrations and summary.

2. Please, comment on the level of complexity of the content:

   - Would it be too difficult/easy for the teachers ?
   - Are the demonstrated skills practicable in the P.S. teachers' environment ?
   - Would the P.S. teachers have difficulty in the language ?
   - Would you recommend such programmes be produced in Kiswahili ?

3. Please, comment on the relevance of the programme in the teachers' environment in Tanzania

   - was the programme lacking ?

   - would the teachers benefit out of it ?

   - is video an appropriate medium for the topic ?

4. Please, comment on the practicability of the embedded assignments suggested at the end of each segment.

Thank you for you invaluable responses.

Appendix II

FORMATIVE EVALUATION

QUESTIONNAIRE

TO PARTICIPANTS.

The purpose of this questionnaire is to gain preliminary feedback about a video programme which is being developed for teachers already serving in Tanzanian schools, as well as for students in conventional teachers' colleges. The feedback will certainly help the designer to modify the programme to the optimum standard before it reaches the intended audience. Your participation in this valuable endeavor is highly appreciated, and all the information will be kept highly confidential. In fact, in this particular questionnaire, you need not write your name.

PART I

DEMOGRAPHIC INFORMATION.

Please, provide the following demographic information by checking (√) in the box as appropriate.

1. SEX. Male (38) Female (12)

2. AGE IN YEARS.
   20-25 yrs. (8)
   26-30 yrs. (19)
   31-35 yrs. (12)
   36-40 yrs. (8)
   41+ yrs. (3)

3. LEVEL OF SCHOOLING REACHED.
   Elementary (Standards 1 - 7 (1)
   Secondary (Forms 1 - IV (5)
   High School (Forms V - VI (44)

4. YEARS OF TEACHING EXPERIENCE.

1- 5 yrs. (17) 6 -10 yrs. (21)
11-15 yrs. (12)

GENERAL INFORMATION.

5. Did you have any training in Fine Art ? yes (2) no (48)

6. Have you ever attended any Audio Visual course ? yes (14) no (36)

PART II.

EVALUATION OF THE VIDEO PROGRAMME

Put an **X** in one of the 5 spaces provided between the descriptive words, which best describe your feelings about the video you have just viewed.

		highly	slightly	neither	slightly	highly	
Example:	Relevant	__	_X_	__	__	__	irrelevant

In the example, the evaluator thinks that the programme is slightly relevant. An X placed in the space far right would mean that the programme is irrelevant.

		highly	slightly	neither	slightly	highly	
7.	interesting	28	21	01	00	00	boring
8.	unmotivational	00	02	00	15	32	motivational
9.	entertaining	23	24	02	15	32	dull.
10.	events too slow	00	07	18	14	08	too fast
11.	unable to hold attention	04	02	05	14	23	able to hold .

12.	programme, useful	33	13	04	00	00	useless
13.	none formative	00	03	01	17	26	informative .
14.	professional quality	25	19	03	01	01	unprofessional
15.	irrelevant information	01	01	03	11	33	relevant info.
16.	Narration, audible	16	22	05	02	02	narration, inaudible.
17.	instructions, clear	17	22	05	03	03	ambiguous.
18.	too much information	05	03	12	13	15	info.just right.
19.	easy to understand	15	23	07	02	03	difficult
20.	pictures, clear	19	22	04	22	33	blurred.
21.	pacing too fast	07	20	17	03	02	slow.
22.	dialogue, audible	16	20	17	05	02	inaudible.
23.	narration, too fast	13	15	17	04	01	too slow.
24.	information, accurate	20	20	06	03	01	inaccurate.
25.	comprehensive package	14	22	05	02	04	sketchy
26.	professional demonstrations	29	17	02	00	02	unprofessional

Circle the number that best corresponds with your opinion of the video you have just viewed.

	disagree	slightly	neutral	slightly	agree
27. The programme gave me new insights about the topic.	(02)	(04)	(00)	(22)	(20)
28. The individual segments were too short.	(01)	(15)	(11)	(16)	(06)
29. The introduction gave me a good idea of what was coming up.	(02)	(04)	(04)	(24)	(16)
30. After a while, the information seemed redundant.	(12)	(14)	(09)	(08)	(07)
31. The three methods demonstrated were a comprehensive treatment	(02)	(02)	(02)	(31)	(13)

of the topic.

32. I would have preferred each of the three methods to be treated separately.	(03)	(03)	(04)	(12)	(28)
33. I obtained new ideas on how to enlarge images.	(01)	(01)	(00)	(17)	(31)
34. I would have preferred a more indepth treatment of the topic.	(01)	(02)	(04)	(12)	(31)
35. It largely confirmed what I already knew about enlarging images.	(19)	(08)	(03)	(11)	(07)
36. I had problems in following the narration.	(12)	(12)	(08)	(13)	(05)
37. The programme is applicable in Tanzanian situation.	(09)	(12)	(02)	(18)	(09)
38. The programme was slow and dragged out.	(16)	(09)	(13)	(05)	(05)
39. The imbedded assignments are relevant and reinforcing.	(05)	(06)	(06)	(17)	(16)
40. The programme tried to do too much..	(07)	(10)	(04)	(20)	(09)
41. The programme ended with an adequate summary.	(05)	(10)	(03)	(19)	(13)

PART III

SELF- EVALUATION

Rate the extent to which you understood the demonstrated skills in the three methods of enlarging images by circling any of the given numbers from 1 to 10. No 1 is for "did not understand" and 10 is for "clearly understood".

least understood - neutral - well understood

1 2 3 4 5 6 7 8 9 10

42. Method 1. Using a Rubber-Band. 07 02 04 05 09 04 07 05 05 02

43. Method 2. Using a Pantograph. 06 03 03 08 09 07 05 03 03 02

44. Method 3. Using an Overhead Projector. 01 00 00 02 02 02 02 07 14 19

Circle any of the following numbers 1 to 10 which best corresponds to your opinion on the extent to which this programme may be useful to teachers in Tanzania.

	least useful				fairly useful			very useful		
45.	1	2	3	4	5	6	7	8	9	10
	(08)	(06)	(06)	(09)	(07)	(04)	(02)	(01)	(01)	(03)

Use the space below to write any of your feelings which were not covered in the statements above. You may wish to suggest areas to be improved.

Thank you for your participation

Note. Figures in brackets or underlined represent a summary of responses