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A Descriptive Study of the Use of Visual Communication Principles for Media Program Design by Nebraska Health Care Educators

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A DESCRIPTIVE STUDY OF THE USE OF VISUAL COMMUNICATION

PRINCIPLES FOR MEDIA PROGRAM DESIGN BY

NEBRASKA HEALTH CARE EDUCATORS

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CHAPTER I

INTRODUCTION

The information age has made us an increasingly visual society. An avalanche of periodicals, televised programming, video and still cameras for business and home use, and complex computerized graphics demand that we learn from visuals constantly in our daily lives.

Health care educators are facing challenges posed by both the expanded use of automated visuals in education and changes in the health care industry itself. Increased medical technology, automated business information systems and stricter certification requirements are forcing health care professionals in all areas to seek more education and ever expand their competencies, while government regulations and an overall decrease in hospital census have threatened the economic security of most health care industries.

In response to this, knowledge of visual communication principles as they relate to education will continue to be more important to health care educators who are charged with the duty of communicating the vast array of medical information available to other health care profession- als in an effective, cost-efficient manner.

Future Trends in Health Care Education

Futurists see health care educators playing a viable role in this high technological, yet cost-conscious environment. Their role will evolve into that of an instructional innovator and change agent for the organization (Stein and Hull, 1984). Health care educators will act as consultants to all hospital departments, offering advice on a multitude of educational situations and programming techniques. One of these

educational programming methods which will inevitably increase with the budget consciousness of the health care industry involves the use of automated media presentations.

Automated media presentations are a basic way of communicating a variety of educational and training information in this industry. Programs may be developed for use by individual viewers or for group showing, and they may or may not be used in conjunction with printed materials. However, despite the wide use of media programs, most health care educators do not possess formal education in instructional design techniques relating to automated media program design.

Problem Statement

Most current, practicing health care educators seem to be women who come from backgrounds in nursing (Stein and Hull, 1984). Their formal education did not include training in communication, education, or instructional design techniques for automated instructional programming. Yet these are the professional educators charged with designing and implementing educational programming for personnel throughout the health care industry. The instructional development process, according to Berry, (1984) should involve both a scripting and a design process in order to produce effective presentations for adults.

Furthermore, as Schlieve and Young (1983) pointed out, computer graphics are becoming a viable way of providing training, and educators and trainers need to have a clear understanding of the basic principles behind visual communication in order to design state-of-the-art programming for learners. To help plan for these future responsibilities,

there was a great need to determine the current use of instructional design methods relating to visual communication in media programs designed by today's practicing health care educators.

Purpose of the Study

As Winn (1984) stated, most insightful media researchers are concentrating their efforts on exploring instructional methods for communicating information, instead of simply studying different audio-visual mediums, in order to find effective ways to transmit educational messages to an audience. The purpose of this study was to examine the use of visual communication principles in any form of automated instructional media produced by Nebraska health care educators to yield a picture of both the levels of knowledge and equipment sophistication in terms of this particular instructional method.

Specifically, this study focused on the following questions:

1. Do Nebraska health care educators possess knowledge of visual communication principles as applied to media programming?

2. What are the formal educational backgrounds of educators working in the field?

3. What continuing education have these educators received regarding communication and media program design?

4. How do these educators use visual communication principles in the design of media presentations used by their institutions?

5. How effective are the visuals used in these media programs?

Definition of Terms

The following terms are defined as they were used in the course of this study:

1. <u>Media program</u> - Any program which utilizes both a visual message and an externally paced audio message to deliver information to an audience.

2. <u>Health care educator</u> - A person whose job it is to design and implement various educational programs or situations for personnel and patients in a health care setting.

3. <u>Visual communication principle</u> - Any proven method of exchanging information through sight only.

4. <u>Cues</u> - Instructional devices of a graphic nature used to guide viewer attention to important information, (i.e., arrows, underlining, color, word labels, etc.).

5. <u>Realism</u> - Visuals which represent an accurate view of real life without idealization. Photographs possess a greater degree of realism than detailed drawings possess, while simple line drawings are more abstract, and possess less realism, than either photographs or detailed drawings.

Assumptions

The following assumptions underlied this study:

1. Individuals contacted to complete the questionnaire and send a program sample objectively completed the task.

2. The questionnaire and rating scale developed for this study were appropriate for determining the use of visual communication principles in designing mediated programs for health care.

3. Most of the personnel who view media programs designed for hospital staff education are females between the ages of 20 and 40. They hold nursing degrees of some kind, are used to learning from visual demonstrations because of their educational training, and many prefer concrete answers to questions instead of abstract theories if their positions require the need to act quickly during what are often life threatening situations.

4. People who view patient education media programs can not be categorized as to specific ages, learning preferences or educational backgrounds.

Limitations of the Study

1. The study involved only those health care educators who are managers/directors of education or inservice education departments in Nebraska hospitals and related health care facilities.

2. This study was subject to those constraints inherent in a descriptive study, such as use of qualitative data.

3. Given the nature of the study, no exact interrater reliability
   tests were given. However, the three raters were chosen
   because they were professionals working in the field who were
   very familiar with the area of media program design. All
   three raters were familiar with the study and the literature
   surveyed.

The Significance of the Study

Current conditions point to the fact health care educators and
trainers will continue to confront new challenges in designing effective
educational programming for a visually sophisticated population. This
study provided insight into the present level of use of visual communi-
cation principles of health care educators designing mediated educa-
tional programming. It also provided a description of the educational
backgrounds of Nebraska health care educators.

The results of this study yielded information which will serve both
the health care educators and managers of health care education depart-
ments in planning for future professional growth and staffing demands.

CHAPTER II

REVIEW OF LITERATURE

Many studies have been done to determine the most effective use of visual communication in instructional media programs. The relevant literature concerning the visual characteristics of instructional media programs is reviewed under three headings: 1) the significance of realism in visuals, 2) cueing as an instructional device, and 3) amount of visual stimuli to include.

The Significance of Realism in Visuals

The question of whether realistic or abstract visuals used in media programs are more effective has been studied extensively, with many experts concluding that highly realistic visuals, such as color photographs, are not always the most conducive to learning. Travers (1964) labeled the widely accepted notion of realism being superior to abstractness, the "worship of a false god". He concluded that the irrelevant details contained in realistic detailed visuals (as based on the immediate learning objective) actually impeded learning.

Arnheim supported Travers' theory with examples of individual viewers' inabilities to understand a group of visuals (1969, p. 309). Forsdale and Forsdale reported Eskimos and African tribesmen were unable to perceive what was going on in photographs shown to them (cited in Visual Thinking, p. 309).

A similar study by Arnheim (1969) demonstrated school children were unable to grasp the concept that states are not really bound by large black lines as they were shown to be on maps. He also concluded that using scale in photographic representations helps to give proper perspective to objects, which is important to enhance learning.

The most extensive studies of the relationship between level of realism in visuals and learning were conducted by Francis Dwyer. His first study (1963) was conducted to determine the relative effectiveness of two methods of presenting visual instruction--programmed instruction and slide/audiotaped instruction. In the study groups the amount of realistic detail in the visual illustration varied from program to program: Group I received no visual aids but had only audiotape instruction; Group II viewed simple line drawings; Group III viewed line drawings with the added dimension of color; Group IV viewed detailed, shaded drawings in black and white; Group V viewed detailed shaded drawings in color; Group VI viewed photographs in black and white; Group VII viewed photographs in color; Group VIII viewed realistic photographs in black and white; and Group IX viewed realistic photographs in color.

Although this study did not find any significant difference in the effectiveness of the two methods of presentation, it did point out all types of visuals are not equally effective in facilitating achievement of different educational objectives. Dwyer also found the most effective type of visual for facilitating learning of specific objectives is dependent on the method of instruction used, and that color can be an important instructional variable (1963).

Working with black and white visuals only, Dwyer (1967) found realistic photographic representation was less effective in complementing oral instruction when teaching university freshmen about the human heart than abstract representation was. The simple line drawing presentation proved to be the most effective visual communication, while some educational objectives were achieved as well by using only oral communication of the material.

In testing the effects of color using the eight heart visual variables, Dwyer found detailed colored drawings best facilitated identification, while simple colored line drawings facilitated total knowledge comprehension. Oral presentation proved most effective on tests of terminology (1971).

A comparison study by Dwyer using the heart variables in three different forms of media instruction—slide/audiotape presentation, television, and programmed instruction—demonstrated that, for both slide/audiotape presentations and television, simple color line drawings and detailed shaded color drawings were equally more effective than less realistic illustrations. Dwyer conjectured this was a function of the increased time students had to interact with the visuals (1973).

Similarly, Ressegieu (1978) found black and white and color still illustrations to be equally effective in teaching biochemistry via television, although students voted a preference for the color presentation of the lecture.

A study by Berry (1974) utilized Dwyer's heart visuals containing colors that were not congruent with colors found in the actual anatomical organ. He concluded colored materials of a more congruent nature were superior to visuals containing noncongruent colors. In a similar

study, Berry also found realism in visuals did not aid students with lower I.Q. levels. The study also confirmed the use of visuals increases learning of overall content material over oral presentation only (1976).

Popham's study, dealing with cartoons versus no cartoons used in slide/audiotape presentations, found no significant differences indicated in the test results, and there was no indication of students favoring one treatment over another (Popham, 1969, p. 28-35). However, Popham's cartoons did not deal directly with the subject matter, but rather were decorative. Cartoons demonstrating critical points and specific learning objectives may have achieved more favorable results.

In support of this notion, Lumsdaine and Sultzer found various types of animation produced a significant increase in learning when used to cue students to important learning objectives in a film on how to read a micrometer (Ball and Byrnes, 1960, p. 95).

A possible explanation for the typical finding of superiority of simple line drawings over realistic photographs is that there is too much information presented in the realistic visual (Dwyer, 1978, p. 157). Dwyer explained, "in many cases the stimuli (among those provided by a photograph) that the learner selects to interact with do not enable him to acquire the intended message" (1978, p. 157). This may be more or less of a problem depending upon the objectives of the instruction.

Realistic visuals work well to acquaint the learner with general features of an object or situation, but if the learner fails to notice many details of realistic visuals, objectives such as identification of components cannot be achieved (Dwyer, 1978, p. 157). A study by Pendered which found slide/audiotape presentations to be more effective

than field trips to relay general concepts to industrial arts classes supports this theory that realistic visuals are effective in introducing general features of an object or situation to learners (1975).

Likewise, Hosley found students taking part in a field study and those viewing a slide/audiotape presentation scored equally well on an examination testing knowledge of general biology concepts. Another study found slides and photographs were superior to training students on actual electronic equipment in teaching its operation and maintenance (Miller, 1975). USAir found its series of slide/audiotape presentations utilizing both realistic photographs and line artwork to be more effective in terms of cost-effectiveness and learning retention than live lecture for teaching proper maintenance techniques (Training, June 1982).

Hannafin (1982) found slide/audiotape presentations to be more effective in producing recall of both concrete and abstract content than presentations using only audio or visual modes of communication. His population, third and fourth graders, was made up of children categorized as demonstrating high, medium or low dominance of verbal or visual learning strategies, and Hannafin found this factor made no difference in content recall or retention on a delayed post test—all groups viewing the slide/audiotape presentation scored better than those viewing programs using only one mode of communication.

Rigg (1969, p. 33-35) sees the photographer himself controlling much of the realism found in a particular photograph. Through the selection of point of view, lighting, color, tone and scale, a photographer can help direct the viewer to the intended visual communication.

Likewise, cutaway views utilizing a photograph and artwork together in one visual can display principles of objects having internal working parts, and photographic representation of specific situations has been found to allow students to preview what the real world will bring, according to Anderson (1976, p. 56).

In summary, designing effective visuals with respect to the level of realism or abstractness should take into account the program format, content, objectives and intended audience. Highly realistic visuals which contain a lot of detail, such as color photographs, can be effective for teaching general introductory information. Less realistic visuals which present less detailed stimuli, such as abstract line drawings, can be effective when teaching terminology and component information. Realism can also be helpful in establishing proper scale and point of view for using an object.

Cueing As An Instructional Device

As a result of his studies, Dwyer hypothesized one way to increase a realistic visual's effectiveness is to limit the amount of information it contains. He conjectured that by using cues to focus the learner's attention on the relevant information, students' learning performance will increase (1978, p. 158).

Instructional cues may be arrows, lines, underlining, color cueing, a change in pacing, music, labeling, sharp focusing on a certain area of the slide, etc. which serve to emphasize the intended communication so the learner can quickly perceive it among all stimuli in the given moment of presentation (Dwyer, 1978, p. 160).

Explaining the importance of cueing, Arnheim hypothesized when an individual views a visual he cannot process all the information simultaneously with either the eye or the mind. A learner must scan specific sections of a visual and encode details as he encounters them. Cueing techniques draw attention to important aspects of the visual (1954, p. 114).

A theory of why people have the capability to remember large numbers of visuals was termed by Fleming and Sheikhian the "trace modality hypothesis" or the "two-memory modality hypothesis," which proposes separate memories for different symbolic modalities (1972). Additionally, Wallach and Averbach concluded that oral naming of an object or picture while it was being viewed allowed both visual and verbal traces to be encoded separately by the learner. Simply viewing a picture allowed for only a visual trace to be encoded (1955). Fleming and Sheikhian used this study to deduce that information stored in dual form will be better remembered than information stored in only one form (1972).

However, one of Fleming and Sheikhian's own studies involving instructional cueing refuted the additive theory. They found 90% of a group of illustrations without words were recognized as compared to 86.3% of illustrations tested that contained words. A second study using lower level words and objects found no significant difference in the recognition levels of the two groups of illustrations. Neither color nor the amount of pictorial information influenced recognizability (1972).

Gropper found one-word verbal labels presented simultaneously with a visual presentation significantly increased learning over presenta-

tions that were entirely visual or entirely verbal (1966). In addition, the study concluded students viewing the presentation with visual one-word labels scored significantly better than students viewing other presentations because the presentation allowed for the learning of general concepts from the visual stimuli and an understanding of technical language aspects from the verbal stimuli. Gropper also concluded when integrating words and pictures, use of a "single-concept" presentation was superior to a presentation involving several different concepts (1966). This theory is congruent with the findings that simple line drawings are often superior to realistic photographs--they present less information to the viewer.

Another study found realistic visuals using cueing with captions containing declarative or imperative statements were more effective than cueing with questions (Briggs, et.al., 1976, p. 131).

From the studies cited, simple visual instructional cues have been found to significantly help learners focus attention on the relevant stimuli and encode information more successfully.

Amount of Visual Stimuli to Include

As shown by Dwyer and Gropper, it is often detrimental to include too much information in the visual communication. The Travers model of the human information processing system, adapted from Broadbent, utilizes a single-channel data-use system which can pass only one message at a time. Travers claimed a multi-media presentation is ineffective unless it has a sufficiently low density of information and a slow rate of presentation to compensate for the added stimuli (1964).

Stressing this theory, Carpenter emphasized the need for mediated programs to fall within the sensory and comprehensional levels of the audience (1962), while McFee warned that the use of a combination of elements in a visual may compete and disguise relevant information (1969, p. 212).

On the other hand, Arnheim saw a danger in including too little detail in visuals. He cited a study by Jean Piaget where children were unable to understand how a tap works from looking at a line drawing of it which omitted many details (1969, p. 312).

Summary

In summary, the literature indicates educationally effective media programs contain several similar elements related to visual communication design. The first overall similarity relates to the proper degree of realism used in visuals. Specifically, the literature indicates several consistencies in this area, including:

1) The levels of realism contained in visuals (on a continuum from simple black and white drawings to complex color photographs) should take into account the program's content, learning objectives and intended audience.

2) The medium selected (slide/audiotape, videotape, etc.) should complement the program content and learning objectives.

3) Color can aid learning. Although this factor has been shown to be significant, nearly all visuals are designed in color today since the cameras and videotape which record color images are much more prevalent than black and white imaging devices are.

4) Visually comparing unfamiliar objects with familiar objects can aid learning.

5) Using a subjective point of view in visuals (as the viewer would see and use the object) increases learner perception of the way objects appear in the real world.

Another overall similarity found among educationally successful visuals is the use of cueing. Specifically, the literature indicates:

1) Visual cueing with simple, clear graphics directs the learner to the intended communication.

Finally, similarity is found in the amount of visual stimuli contained in educationally successful visuals. These include:

1) Visuals should be relevant to the audio message, but should not exactly duplicate what is being stated.

2) Information presented should be limited to one idea per visual and one main concept per program.

These similarities indicate guidelines to be followed for designing effective visuals in educational media programs.

CHAPTER III

DESIGN OF THE STUDY

Introduction

As discussed in Chapter I, health care educators will face continued demands to provide more intensive education and training activities with limited budgets. Chapter I also pointed out many practicing health care educators do not possess backgrounds in communication, education or instructional technology, where visual communication skills, along with other education methods, should have been learned.

The review of literature identified eight specific guidelines for media program designers to follow in order to enhance the educational experience through visual communication. This study examined seven of these eight guidelines including: 1) accounting for the most appropriate level of visual realism, 2) selecting the proper media format, 3) providing visual comparisons, 4) using a subjective camera angle, 5) providing visual cues, 6) enhancing the audio message with visuals, and 7) limiting the amount of visual information presented. This study omitted the principle that color can aid learning since nearly all of today's cameras and videotape use color as a standard feature.

This study determined the extent to which these seven guidelines are being followed by current health care educators in Nebraska. The study also examined the educational backgrounds and formal training of Nebraska's health care educators.

Type of Study

To accomplish the goals of this study, descriptive data were needed. Information was gathered by requesting that managers/directors of education or inservice education departments in each of Nebraska's hospitals complete questionnaires containing background information and, if applicable, send samples of automated media programs their departments produced to the researcher for use in this study. A rating scale which examined the use of the seven visual guidelines in the sample media programs was developed to assess each program's adherence to the visual communication principles outlined. The instrument was designed using both closed questions and Likert-type scale responses so as to encompass all of the seven guidelines for visual communication dealing with educational media. The intent of this rating form was to assess the present use of visual communication principles by Nebraska health care educators designing media presentations for education and training purposes.

Instrumentation

The rating scale was presented to three people from the instructional design and development field (all of whom were from health care settings) for their input and review. They were asked to examine the form in terms of its measurement of the seven guidelines established in the review of literature. Two of these people were also asked to view each sample program submitted to the researcher and complete a rating form for each program. The researcher also viewed each program and completed rating forms for each program.

Definition of the Population Sample

The population used for this study was the current managers/directors of education and training departments in Nebraska hospitals. These people are usually considered to be leaders in their field. This study did not directly include people working in hospital education departments who are not managers/directors. However, a manager/director may have chosen to send a media program written and designed by one of his/her employees.

Collection of Data

The questionnaire was sent to all current manager/directors of education departments in Nebraska hospitals. There were 108 hospitals in Nebraska. A cover letter of introduction and explanation was also sent at this time. This letter guaranteed anonymity through the use of a numbering system, which allowed only the researcher to identify specific questionnaires in order to determine return rates.

The subjects were asked to fill out the questionnaires and return them within ten days in a postage paid envelope enclosed with the questionnaire. At the end of two weeks, another letter was mailed to those subjects who did not return their questionnaires reminding them to complete the questionnaire. The questionnaire contained a section which asked if media programs are produced in-house and, if so, asked for a sample program to be sent. After the questionnaire was returned, a self-addressed envelope was sent for the program to be mailed to the researcher. The researcher and two other people familiar with the study

watched each program submitted and independently rated each according to the form developed for evaluating the use of visual communication principles.

Analysis of Data

The information collected from the questionnaire was analyzed for any similarities or differences among hospital education departments. The three independent ratings of each program submitted were also analyzed using percentile, mean, and median where appropriate.

CHAPTER IV

PRESENTATION OF DATA

In Chapter I, it was stated that the purpose of this study was to examine the capabilities for audiovisual media production in Nebraska hospitals. This information could be valuable to health care educators throughout the state of Nebraska and throughout the country. This study included two parts: the makeup of existing hospital education and training departments and the use of visual communication principles by Nebraska health care educators when designing audiovisual media productions.

Specifically the first part of this study focused on the following areas:

1. Hospital size - Is the hospital publicly or privately owned and how many beds does it contain?

2. Activities provided - What educational activities are provided by the education and training department and is media program design one of these activities?

3. Design - Who designs the visuals used in a media production?

4. Staff - How many people work in the education and training department and what are their educational backgrounds?

The second part of this study focused on the following areas:

1. Realism - How realistic are the visuals contained in a media production and is this congruent with the program's content?

2. Medium - Does the medium selected complement the program's content and objectives?

3. Comparison – Are unfamiliar objects visually compared with familiar objects?

4. Point of view – Is a subjective point of view utilized so viewers see objects as they would use them?

5. Cueing – Are visual cues included to direct viewers to the intended communications?

6. Visual relevancy – Do visuals complement the audio message without duplicating it?

For the first part of the study, one hundred and eight questionnaires were mailed to the directors of education and training departments in all Nebraska hospitals. Of those, forty-nine were returned within a two week period. A follow-up letter was mailed to the remaining education and training department directors. Within two weeks nine more questionnaires were returned. The total return of fifty-eight questionnaires yielded a response rate of 54%.

The purpose of this chapter is to present the data of this study. Study results are presented in four different sections. The first section presents information concerning the demographics of responding hospital education and training departments. Section two describes the types of educational activities performed. Section three discusses the overall makeup of those hospital education and training departments producing educational media, and section four examines the use of visual communication principles for media program design.

SECTION I

Demographic Data

In this section questions 1A, 1B, 6, 7 and 8 are dealt with. Each of the questions relates directly to demographics of the study population.

Question 1A

Of the fifty-eight respondents in the study group, all fifty-eight responded to question number 1, which contained a part A and part B and identified the type and size of the organization. The majority of the responding hospitals, 34, indicated that they were publicly owned facilities. This represented 58.6% of the hospitals. Twenty-four of the responding hospitals, 41.4%, indicated that they were privately owned. No responses were received in the category of health care facility other than a hospital. (The average number of beds contained in these hospitals was 105.) Table 4.1 summarizes this data.

TABLE 4.1

TYPE OF ORGANIZATION REPRESENTED
BY THE QUESTIONNAIRE RESPONDENT

Type of Organization	Number of Hospitals	Percent of Total
Public Hospital	34	58.6
Private Hospital	24	41.4
Health facility other than Hospital	0	0
	58	100

QUESTION 1B

Fifty-six hospitals responded to part B of question number 1 pertaining to the number of beds in their facilities. The majority of the respondents, 42 or 75%, fell within the range of 0 - 100 beds. Five respondents, or 8.9%, indicated a range of 101 - 200 beds. Four respondents, or 7.1%, indicated a range between 201 - 300 beds, while two responses, or 3.6%, showed a size of 301 - 400 beds. One response, or 1.8%, indicated 401 - 500 beds, one response, or 1.8%, indicated 501 to 600 beds and one response, or 1.8%, indicated 601 - 700 beds. Table 4.2 summarizes this distribution.

TABLE 4.2

DISPLAY OF DISTRIBUTION OF NUMBER OF
BEDS CONTAINED IN EACH HOSPITAL

Number of Beds Total	Number of Hospitals	Percent
0 - 100	42	75.0
101-200	5	8.9
201-300	4	7.1
301-400	2	3.6
401-500	1	1.8
501-600	1	1.8
601-700	1	1.8
	56	100.0

Question 6

Fifty-five participants responded to Question number 6, which attempted to determine the number of staff people working in each education and training department. This question omitted clerical personnel. Forty one or 74.5% of those responding indicated their departments included 1-2 people. Seven hospitals, or 12.7%, indicated their departments contained 3-5 people, while 5 hospitals, or 9.1% said they have 6-10 staff people in their departments. Two respondents, or 3.6%, indicated they employ 11-15 staff people in their departments. There were no respondents who indicated their departments contain over 15 people. Table 4.3 summarizes these distributions.

TABLE 4.3

NUMBER OF PERSONNEL
EMPLOYED BY THE DEPARTMENT

Number of Personnel Employed	Number of Hospitals	Percent of Total
1-2	41	74.5
3-5	7	12.7
6-10	5	9.1
11-15	2	3.6
Over 15	0	0
	55	100

Question 7

Question number 7 contained two parts, part A and part B. This question asked for (A) the highest educational degree held by each staff member and (B) the field of study of each staff member. Because of the variance in department size, there were a total of 133 responses to this question. Of those, 12 respondents or 11.1%, held high school diplomas. Thirty-six individuals or 27.1% held 2 or 3 year college degrees. Of these 36 individuals, three or 12.3% held associate degrees in the arts and sciences. Five people, or 3.8% held LPN degrees, and 28 people, or 21.1% of the respondents, held RN degrees.

Fifty-six individuals or 42.1% of the participants, held bachelors degrees, including 22 respondents, or 16.5%, who held a bachelor of science degree. Eleven individuals, or 8.3% held bachelor of arts degrees, and three people, 2.3%, held a bachelor of fine arts degree. Twenty individuals, or 15.0%, held bachelor of science in nursing degrees.

Twenty-nine individuals, or 21.8% of the participants, held degrees beyond the bachelors degree. Eleven of these individuals, or 8.3%, held a master of arts degree, while seven individuals or 5.3%, held a master of science degree. One individual, or .8% of the respondents, held a master's in library science degree, and one individual, or .8%, of the sample, held a master's in business administration degree.

Five individuals, or 3.8%, held a medical doctorate. Four individuals, or 3.0%, held a doctorate in philosophy degree. Table 4.4 summarizes this data distribution.

TABLE 4.4

EDUCATIONAL DEGREES OF DEPARTMENT
PERSONNEL

Educational Degree	Number of Personnel	Percent of Total
High School	12	11.1
Associate (A & Sci)	3	2.3
LPN	5	3.8
RN	28	21.1
		38.2
BS	22	16.5
BA	11	8.3
BFA	3	2.3
BSN	20	15.0
		42.1
MA	11	8.3
MS	7	5.3
MLS	1	.8
MBA	1	.8
MD	5	3.8
Ph.D.	4	3.0
		21.8
	133	100

Question 7 Part B

Part B of question number 7 asked for the particular fields of
study of the respondents in order to determine the percentage of people
with expertise in nursing, education, arts and sciences or other fields.
One hundred and twenty-one individuals were included in the data, since

those 12 individuals with only high school diplomas did not indicate a field of study. Of those sampled, 56 individuals, or 46.7%, held nursing degrees. Twenty-eight individuals, or 23.3%, held degrees in the arts and sciences. Twenty-two individuals, or 17.5%, held education degrees. Six individuals, or 5.0% , held degrees in medicine, while 5 individuals, or 4.2%, held degrees in health. Four individuals, 3.3%, held business degrees. Table 4.5 summarizes these data.

TABLE 4.5

FIELDS OF STUDY OF DEPARTMENT PERSONNEL

Field of Study	Number of Personnel	Percent of Total
Nursing	56	46.7
Arts & Science	28	23.3
Education	22	17.5
Medicine	6	5.0
Health	5	4.2
Business	4	3.3
	121	100

Question 8

Fifty-four participants responded to question number 8, which indicated attendance at continuing education activities relating to audiovisual program design. Twenty-three participants, or 42.6%, said their staff had never attended a continuing education program on audio-visual production. Eighteen individuals, or 33.3%, indicated they had attended 1-2 sessions, while five individuals, or 9.3%, said they had participated in 3-5 sessions. Two respondents, or 3.7%, said they had attended 6-10 sessions. Six individuals, or 11.1%, indicated they had

participated in over 10 continuing education programs dealing with audio

visual production and design. Table 4.6 illustrates this distribution.

TABLE 4.6

STAFF ATTENDANCE AT AUDIO VISUAL
PRODUCTION CONTINUING EDUCATION SESSIONS

Number of Sessions	Number of Personnel	Percent of Total
0	23	42.6
1-2	18	33.3
3-5	5	9.3
6-10	2	3.7
Over 10	6	11.1
	54	100

SECTION II

Educational Activities

In this section questions 2A, B, 3, 4, 5, 9 and 10 are dealt with. Each of these questions relates directly to education activities, including media production design capabilities, of the study population.

Question 2A

Of the fifty-eight respondents, 57 responded to question number 2A. This question indicated the time rate spend designing audiovisual programs. Forty-seven of these respondents, or 82.5%, indicated they spend from 0-24% of their time designing media programs. Eight departments, or 14.0%, indicated they spend 25-49% of their time designing media programming, while two departments, or 3.5%, indicated 50-74% of their time was spent designing instructional media programs. No departments reported spending either 75-99% of their time or 100% of their time on media program design. Table 4.7 illustrates this distribution.

TABLE 4.7

DEPARTMENT TIME SPENT ON MEDIA
PROGRAM DESIGN

Percentage of Time	Number of Departments	Percent of Total
0-24%	47	82.5
25-49%	8	14.0
50-74%	2	3.5
75-99%	0	0
100%	0	0
	57	100

Question 2B

Of the fifty-eight respondents, fifty-seven indicated the 2-3 most common activities provided by their departments. Fifty-six departments, or 96.6%, indicated they provide inservice education. Twenty of these departments, or 34.5%, provide patient education activities, while nine departments, or 15.5% provide management training. Community education is provided by eight departments, or 13.8%, of the respondents. Eight departments or 13.8%, indicated they also provided orientation activities to new employees. Specific training is provided by six departments, or 10.3%. Media program design is one of the three top functions provided by only four departments, or 6.9%. Four departments, or 6.9% also indicated they provide educational training toward an educational degree, while two departments, or 3.4%, provide library services to their organizations. Table 4.8 shows this distribution.

TABLE 4.8

MOST COMMON TYPES OF EDUCATIONAL
ACTIVITIES PROVIDED

Educational Activity	Number of Departments Conducting this Activity	Percent of Departments Conducting this Activity
Inservice Educ.	56	96.6
Patient Educ.	20	34.5
Management Trng.	9	15.5
Community Educ.	8	13.8
Orientation	8	13.8
Specific Trng.	6	10.3
Media Prog. Design	4	6.9
Educational Trng for Degrees	4	6.9
Library Services	2	3.4

Question 3

Question number 3 dealt with who plans for the visual communication portion of instructional media programs. Of the fifty-eight question-naire respondents, twenty-four answered this question. Many respondents left question number 3 unanswered because they indicated they do not produce audiovisual programs. Five individuals, or 20.8%, indicated the scriptwriter planned for the visual portion of the presentation. Three individuals, or 12.5%, indicated they used an outside specialist to plan for the visuals. Two departments, or 8.3%, indicated that the director of nursing plans for the visuals, while two departments, or 8.3%, said instructors were the ones who plan for the visual portion of their audio visual programming. One individual, or 4.2%, indicated a photographer is the one who plans for visuals. No one responded that an artist or a hospital specialist outside their department is the one responsible for planning visuals.

Several departments indicated they rely on a combination of person-nel to plan for visuals used in audiovisual productions. Of these respondents, five departments, or 20.8%, indicated that a combination of the educational consultant and the media specialist were responsible together for planning for visuals. Three individuals, or 12.5%, respond-ed that it combined its education staff and members of the nursing staff to plan for needed visuals. Two individuals, or 8.3%, indicated both the scriptwriter and the content specialist have a hand in planning for visuals. One respondent, or 4.2%, indicated that the content specialist and the media specialist share the duty of planning for visuals. One respondent, 4.2%, indicated that the content specialist and the media

specialist share the duty of planning for visuals. Table 4.9 illustrates this distribution.

TABLE 4.9

PERSONNEL RESPONSIBLE FOR PLANNING VISUALS
IN MEDIA PROGRAMS

Personnel Member	Number of Departments	Percent of Total
Scriptwriter	5	20.8
Outside specialist	3	12.5
Director of Nursing	2	8.3
Instructor	2	8.3
Photographer	1	4.2
Artist	0	0
Hospital Specialist Outside Dept.	0	0
Combination Educational Consultant & Media Spec.	5	20.8
Combination Education Staff and Nursing Staff	3	12.5
Combination Scriptwriter & Content Specialist	2	8.3
Combination Content Specialist and Media Specialist	1	4.2
	24	100

Question 4

Of the fifty-eight respondents, twenty-three answered question number 4, which determined who designs the art visuals for media programs. Again, most of those who left this question unanswered had indicated they do not produce media programming. Five departments, or

21.7%, indicated they have an outside specialist design their art visuals. Three departments, or 13.0%, indicated they have an artist design the art visuals. One department, or 4.4%, indicated that a scriptwriter designs the art visuals, while one department, or 4.4%, indicated that a photographer is responsible for designing art visuals. One department each, or 4.4%, indicated that they have an instructor or the director of nursing design art visuals.

Several departments indicated this responsibility was shared by two staff members. Five departments, or 21.7%, said that designing art visuals was the shared duty of the education staff and the nursing staff. Three individuals, or 13.0%, responded that the educational consultant and media specialist design art visuals together. Two departments, or 8.7%, indicated that the photographer and the content specialist design art visuals, while one department, or 4.4%, indicated this was the shared responsibility of the scriptwriter and an outside specialist. Table 4.10 summaries these data.

TABLE 4.10

PERSONNEL RESPONSIBLE FOR DESIGNING ART
VISUALS IN MEDIA PROGRAMS

Personnel Member	Number of Departments	Percent of Total
Outside Specialist	5	21.7
Artist	3	13.0
Scriptwriter	1	4.4
Photographer	1	4.4
Director of Nursing	1	4.4
Instructor	1	4.4
Combination of Educational Staff & Nursing Staff	5	21.7
Combination of Educational Consultant & Media Specialist	3	13.0
Combination of photographer & Content Specialist	2	8.7
Combination of scriptwriter & Outside Specialist	1	4.4
	23	100

Question 5

Twenty-three of the fifty-eight participants answered question
number 5, which dealt with who designs the photography visuals used in
media programs. Many respondents left this question unanswered because
they indicated they did not produce media programs.

Eight departments, or 34.8%, indicated that a photographer is
responsible for designing photographic visuals, while six departments,
or 26.1%, said an outside specialist performs this task. One depart-

ment, or 4.4%, indicated that an instructor designs the photographs used in media programs. One department, or 4.4%, indicated that a hospital specialist outside the department performs this duty.

Several departments also indicated that they use a combination of staff to design photographic visuals. Three individuals, or 13.0%, indicated that educational staff and the nursing staff share this responsibility, while two departments, or 8.7%, said both the education-al consultant and media specialist perform this function. One depart-ment, or 4.4%, said it uses a combination of a photographer and the content specialist to design photographic visuals. One department, or 4.4%, indicated that a scriptwriter, artist and content specialist all plan for photographic representation. Table 4.11 illustrates this distribution.

TABLE 4.11

PERSONNEL RESPONSIBLE FOR DESIGNING PHOTOGRAPHY
VISUALS IN MEDIA PROGRAMS

Personnel Member	Number of Departments	Percent of Total
Photographer	8	34.8
Outside Specialist	6	26.1
Instructor	1	4.4
Hospital Specialist Outside Dept.	1	4.4
Combination of Educ. Staff & Nursing Staff	3	13.0
Combination of Educ. Staff & Media Specialist	2	8.7
Combination of Photographer & Content Specialist	1	4.4
Combination of Scriptwriter, Artist and Content Spec.	1	4.4
	23	100

Question 9

All fifty-eight individuals responded to question number 9 which examined the department's ability to produce its own audiovisual programs. Thirty-four departments, or 58.6%, indicated they do not produce media programs. Twenty-four departments, or 41.4%, indicated they do produce media programs. Table 4.12 summarizes these data.

TABLE 4.12

DEPARTMENTAL PRODUCTION OF AUDIOVISUAL
MEDIA PROGRAMS

Produces Media	Number of Departments	Percent of Total
No	34	58.6
Yes	24	41.4
	58	100

Section III

Education Department Staff and Media Programming

This section examines the makeup of eight departments who submitted educational media programs for use in this study. Of twenty-four respondents who indicated their departments do production, eight sent programs (six videotapes and two slide/audiotapes).

Of those sixteen departments who did not submit a program for study, ten, or 63.0%, specifically indicated they did not have extra copies available and had no way to duplicate a videotape. Four of these ten further indicated that they only videotape medical/nursing lectures and inservices so personnel can view these at a later date.

Unlike those departments which indicated they do not produce media programs, those departments which did submit samples included an average of 8.25 staff members working in their departments. Furthermore, the backgrounds of the people working in these departments were varied and encompassed several different fields relevant to the production of educational media programming.

For example, out of a total of sixty-six staff people working in these eight departments, only eight, or 12.1%, had nursing backgrounds. On the other hand, seventeen people, or 25.8%, had backgrounds in education and 22 people, or 33.3%, had arts and sciences backgrounds, thirteen of whom held degrees specifically in journalism, communication, public relations and media production.

Three people, or 4.5%, held medical degrees, while three people, or 4.5%, had backgrounds in the health field. Thirteen people, or 19.7%, had no specialty indicated either because of the respondent's lack of

knowledge of this information or the fact that most of the thirteen people had only high school. Table 4.13 illustrates these data.

TABLE 4.13

FIELDS OF STUDY OF PERSONNEL IN DEPARTMENTS
PRODUCING SAMPLE MEDIA PROGRAMS

Field of Study	Number of People	Percent of Total
Arts and Sciences	22	33.3
Education	17	25.8
Nursing	8	12.1
Health	3	4.5
Medicine	3	4.5
Not applicable	13	19.7
	66	100

Average bed size of these eight hospitals was 346, while total average bed size of the fifty-eight hospitals surveyed was 105. This indicated that larger hospitals are the ones who are able to either buy or rent media production capabilities. Table 4.14 illustrates these data.

TABLE 4.14

AVERAGE BED SIZE OF MEDIA PRODUCING DEPARTMENTS
AND NON-MEDIA PRODUCING DEPARTMENTS

Media Production	Average Bed Size
Yes	346
No	105

Section IV

Visual Communication Principles and Media Program Design

In this section data was gathered by a panel of three persons --
Dr. John Welsh, a manager of a hospital education and training depart-
ment who holds a master's degree in instructional technology and a
doctorate in adult education; Ms. Jean Patterson, a media specialist at
a university medical center who holds a bachelor's degree in broadcast-
ing, and the researcher, who is an educational consultant at a hospital
and holds a degree in English education.

This panel separately viewed the eight educational media produc-
tions submitted for use in this study and rated them on several visual
variables shown to impact the educational effectiveness of audiovisual
programs. These variables included use of the medium selected, level of
realism, comparison, point of view, visual cueing, visual relevancy and
limiting visual information.

Selection of the Medium

Question 1

Question number 1 dealt with the appropriateness of the medium
selected. It asked raters to determine using a Likert-type rating scale
system (including the categories or excellent, good, average, fair and
poor), if a slide/audiotape or videotape presentation was the most
appropriate way to present the information. The question required a
response on a scale of one to five. The number one indicated a poor

level of appropriateness while five indicated an excellent level of appropriateness. Each of the three raters evaluated each of the eight productions – thus, a total of 24 evaluation forms were obtained.

A poor level of appropriateness was indicated on two response forms or 8.3%. One, or 4.2%, received a fair rating, while three, or 12.5%, showed an average level of appropriateness. Ten, or 41.7%, were at the good level, while eight, or 33.3%, were rated at the excellent level for appropriateness. Figure 4.1 presents these data.

FIGURE 4.1

APPROPRIATENESS OF MEDIUM SELECTED
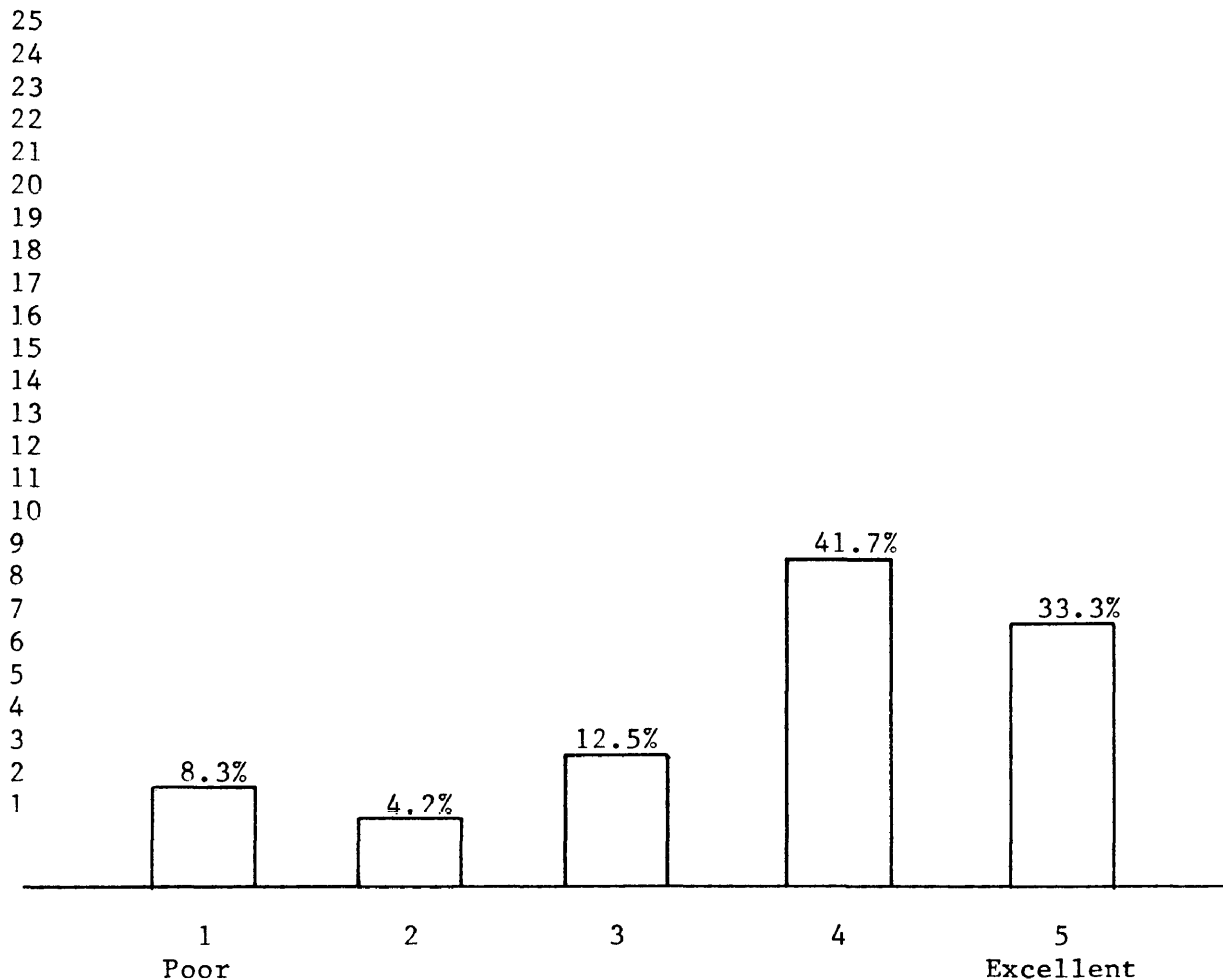
Mean = 3.88

Realism Level

Questions number 2, 3, 4 and 5 examined the appropriateness of the realism level of visuals contained in the sample media programs.

Question number two examined the type of information presented. Of the twenty-four responses, one, or 4.2%, indicated a program was attitude building/motivational in nature. Two, or 8.3%, were given in the category of terminology/component teaching. Nine, or 37.5%, were given in the step-by-step process category, while the majority, twelve, or 50.0% were found to contain general introductory information. Table 4.15 illustrates these data.

TABLE 4.15

TYPE OF INFORMATION PRESENTED
IN SAMPLE MEDIA PROGRAMS

Type of Information	Number of Responses	Percent of Total
General Introductory Information	12	50.0
Step-by-step Process	9	37.5
Terminology/Component Teaching	2	8.3
Attitude Building	1	4.2
	24	100

Question 3

This question asked raters to determine the type of visuals used in the sample programs. Thirteen responses, or 54.2%, indicated use of

either still photographs or moving pictures. Eight, or 33.3%, indicated the programs contained a combination of words and still/moving pictures. Three, or 12.5%, indicated visuals were a combination of detailed shaded drawings and still/moving pictures. No responses were indicated for the categories of simple line drawings, detailed shaded drawings or words only. Table 4.16 shows this distribution.

TABLE 4.16

TYPE OF VISUALS CONTAINED IN
SAMPLE MEDIA PROGRAMS

Type of Visuals	Number of Responses	Percent of Total
Photographs/moving pictures	13	54.2
Combination of words and still/moving pictures	8	33.3
Combination of detailed shaded drawings and still/moving pictures	3	12.5
Simple line drawings	0	0
Detailed shaded drawings	0	0
Words only	0	0
	24	100

Question 4

Question number 4 determined the intended audiences for the media programs sampled. Ten responses, or 41.7%, indicated programs were aimed at health professionals. Eight, or 33.3%, indicated programs were aimed at patients, and six, or 25.0%, found the

general public to be the intended audience. None of the responses indicated that the audience was not evident from the program. Table 4.17 summarizes these data.

TABLE 4.17

INTENDED AUDIENCES OF SAMPLE
MEDIA PROGRAMS

Intended Audience	Number of Responses	Percent of Total
Health Professionals	10	41.7
Patients	8	33.3
General Public	6	25.0
Not evident	0	0
	24	100

Question 5

This question determined the appropriateness of the realism level of visuals as related to the program content, objectives and audience. It used a Likert-type scale with one being a "poor" realism level and five being an "excellent" realism level. One response, or 4.2%, indicated a poor level of visual realism, while one, or 4.2%, also indicated a fair realism level. Four, or 16.7%, indicated an average appropriateness of the realism level. Ten, or 41.7%, indicated a good realism level employed, while eight, or 33.3%, were given at the excellent level for realism appropriateness. Figure 4.2 illustrates these data.

FIGURE 4.2

APPROPRIATENESS OF VISUAL REALISM LEVELS USED
IN SAMPLE MEDIA PROGRAMS


```
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10                                    41.7%
 9                                    ┌────┐
 8                                    │    │   33.3%
 7                                    │    │   ┌────┐
 6                                    │    │   │    │
 5                                    │    │   │    │
 4                   16.7%            │    │   │    │
 3                   ┌────┐           │    │   │    │
 2                   │    │           │    │   │    │
 1   4.2%    4.2%    │    │           │    │   │    │
   ┌────┐  ┌────┐    │    │           │    │   │    │
   │    │  │    │    │    │           │    │   │    │
───┴────┴──┴────┴────┴────┴───────────┴────┴───┴────┴───
     1       2        3         4         5
   Poor                                 Excellent
```
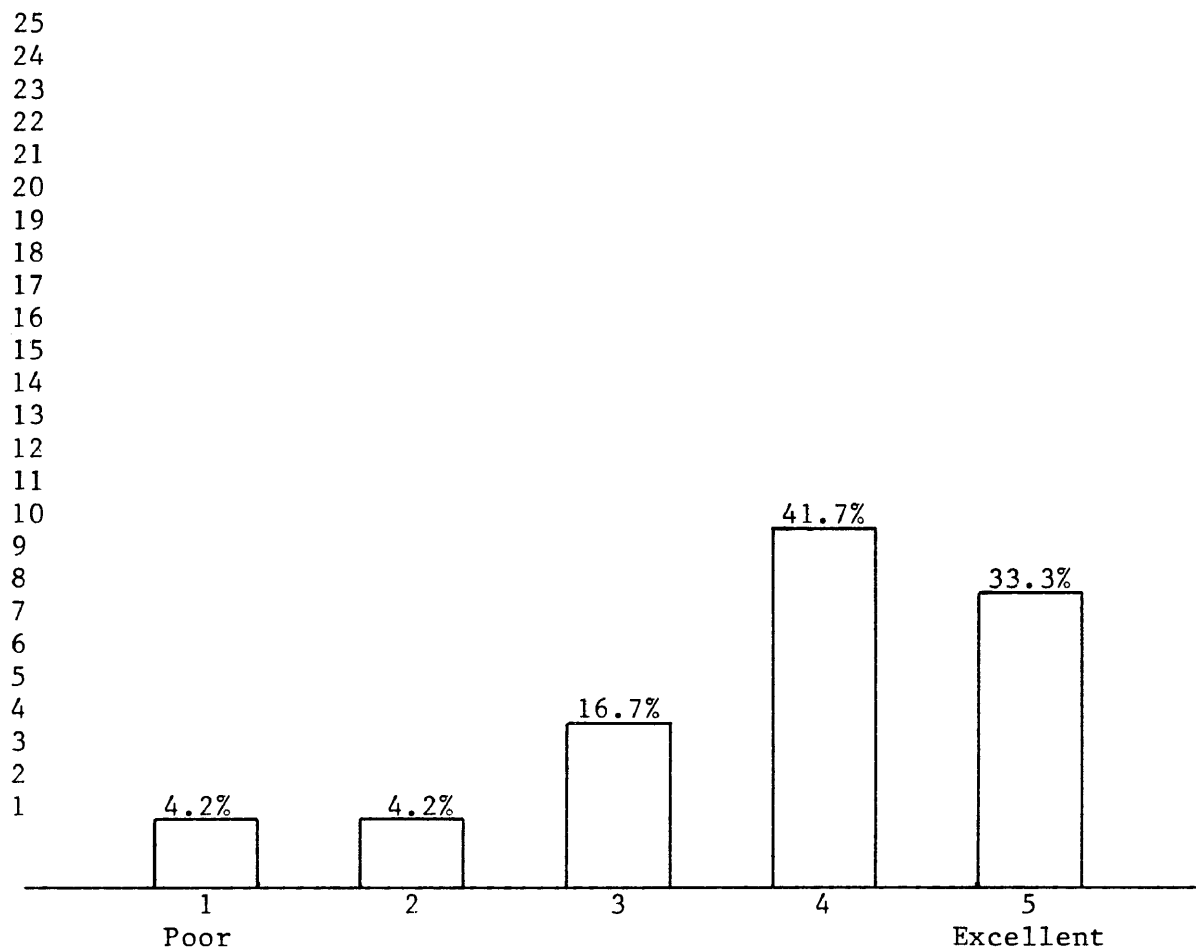
Mean = 3.96

Comparison

Question 8

Question number 8 examined the use of visual comparisons between
unfamiliar and familiar objects. Using a Likert-type scale, the question
measured whether comparisons were used always, almost always,
sometimes, almost never, never and not applicable. Ten responses, or
41.7%, found the use of visual comparisons to be not applicable. Eight,
or 33.3%, indicated visual comparisons were never used, while two,

or 8.3%, found visual comparisons were almost always made. Two, or 8.3%, indicated visual comparisons were almost never made. No responses were given in the category of always using visual comparisons. Table 4.18 shows this distribution.

TABLE 4.18

USE OF VISUAL COMPARISONS IN
SAMPLE MEDIA PROGRAMS

Frequency of Comparison	Number of Responses	Percent of Total
Always	0	0
Almost always	2	8.3
Sometimes	2	8.3
Almost never	2	8.3
Never	8	33.3
Not applicable	10	41.7
	24	100

Point of View

Question 9

Question number nine examined the use of a subjective point of view, (positioning the camera as the viewer would actually see objects as he/she used them), for the visual content presented. Of the twenty-four responses given, seven, or 29.2%, indicated that a subjective viewpoint was never used. Five, or 20.8%, indicated the subjective viewpoint was used sometimes. Four, or 16.7%, found this variable to be not applicable, while five, or 20.8%, indicated a subjective point of view was almost always used. Three, or 12.5%, indicated the subjective point of view was almost never utilized, and no responses found this viewpoint to always be utilized. Table 4.19 illustrates these data.

TABLE 4.19

USE OF THE SUBJECTIVE POINT OF VIEW OF VISUAL
CONTENT IN SAMPLE MEDIA PROGRAMS

Frequency of Comparison	Number of Responses	Percent of Total
Always	0	0
Almost always	5	20.8
Sometimes	5	20.8
Almost never	3	12.5
Never	7	29.2
Not applicable	4	16.7
	24	100

Visual Cueing

Questions 6A, 6B, 7 and 11 dealt with visual cueing techniques in the sample media programs.

Questions 6A

Question 6 contained two parts, 6A and 6B. Question 6A asked if the sample programs contained any graphic visual cueing. Fifteen responses, or 62.5%, indicated that no graphic visual cues were used. Nine responses, or 37.5%, indicated the presence of graphic visual cues. Table 4.20 illustrates this.

TABLE 4.20

USE OF GRAPHIC VISUAL CUES IN
SAMPLE MEDIA PROGRAMS

Contains Graphic Cues	Number of Responses	Percent of Total
Yes	9	37.5
No	15	62.5
	24	100

Question 6B

This question dealt with types of graphic visual cues contained in those media programs using cueing techniques. Instead of a total of twenty-four responses, this question received a total of nine responses, since fifteen forms indicated no graphic visual cues were present in the programs. Thus, three media programs, or 37.5%, of the eight programs sampled contained some type of graphic visual cueing.

All three of the programs using visual cues where found to contain word labels, as indicated by the nine responses given in this category. Five responses indicated that two of the programs contained word statements. However, since a total of six responses were not given here, one rater must not have identified use of this graphic technique in one of these two programs. One program contained color highlighting, as indicated by the three responses, and one program contained use of arrows, also as indicated by the three responses. In the "Other" category, one of the raters found a program to contain use of a symbolic graphic, and one of the raters found an animated character pointing to be utilized in one of the programs. Table 4.21 illustrates these data.

TABLE 4.21

TYPES OF GRAPHIC VISUAL CUES CONTAINED
IN SAMPLE MEDIA PROGRAMS

Type of Graphic Cue	Number of Responses
Word Labeling	9
Word Statements	5
Color Highlighting	3
Arrows	3
Other-Symbolic Graphic	1
Other-Animated Character Pointing	1

Question 7

This question dealt with the effectiveness of graphic visual cues identified in sample programs viewed. A total of nine responses were given to a Likert-type scale with one being "poor" and five being "excellent". Five, or 55.6%, indicated good use of visual cues, while two, or 22.2%, found their effectiveness to be at the fair level. One, or 11.1%, found an excellent use of visual cues, while one, or 11.1%, indicated average use of this technique. No responses indicated a poor use of visual cues in the programs containing them. Figure 4.3 illustrates these data.

FIGURE 4.3

EFFECTIVENESS OF GRAPHIC VISUAL CUES
IN SAMPLE MEDIA PROGRAMS
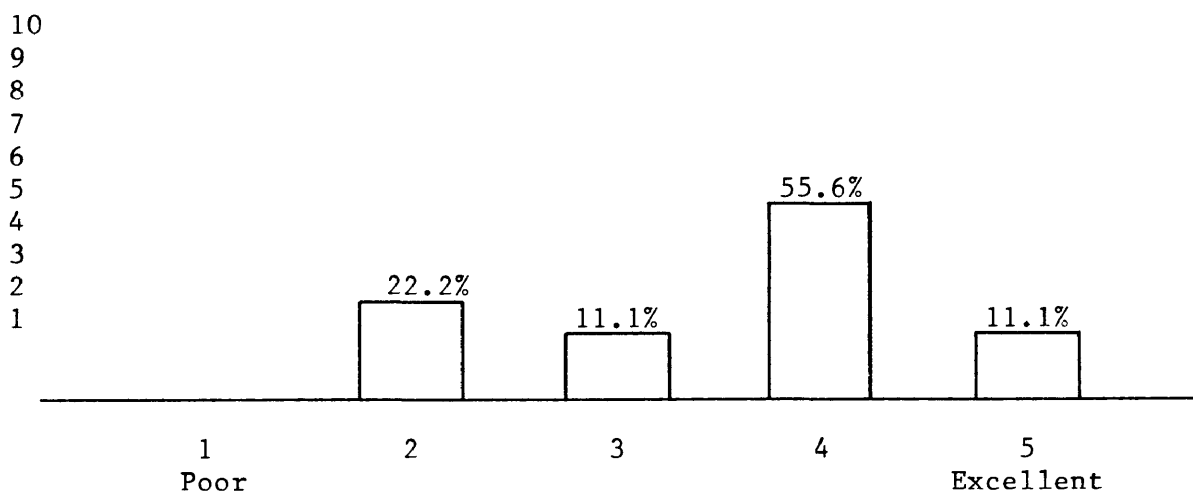
Mean = 3.56

Question 11

This question examined the overall use of photographic elements as visual cues to direct learners to the intended communication through the use of the Likert-type scale. Camera techniques such as the use of

contrast, depth of field, leading lines, zooms and lighting were includ-
ed here.

Nine responses, or 37.5%, rated the use of photographic elements as good. Five, or 20.8%, rated this as average, while five, or 20.8%, indicated poor use of photographic elements for visual cueing. Three, or 12.5%, rated this category as excellent, while two, or 8.3%, indicated it as fair. Figure 4.4 illustrates this distribution.

FIGURE 4.4

PHOTOGRAPHIC ELEMENTS AS VISUAL CUES

```
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
 9                                          37.5%
 8                                          ┌────┐
 7                                          │    │
 6                                          │    │
 5    20.8%              20.8%              │    │
 4    ┌────┐             ┌────┐             │    │        12.5%
 3    │    │             │    │             │    │        ┌────┐
 2    │    │    8.3%     │    │             │    │        │    │
 1    │    │    ┌────┐   │    │             │    │        │    │
      │    │    │    │   │    │             │    │        │    │
──────┴────┴────┴────┴───┴────┴─────────────┴────┴────────┴────┴──────
        1         2         3                 4              5
      Poor                                               Excellent
```

Mean = 3.13
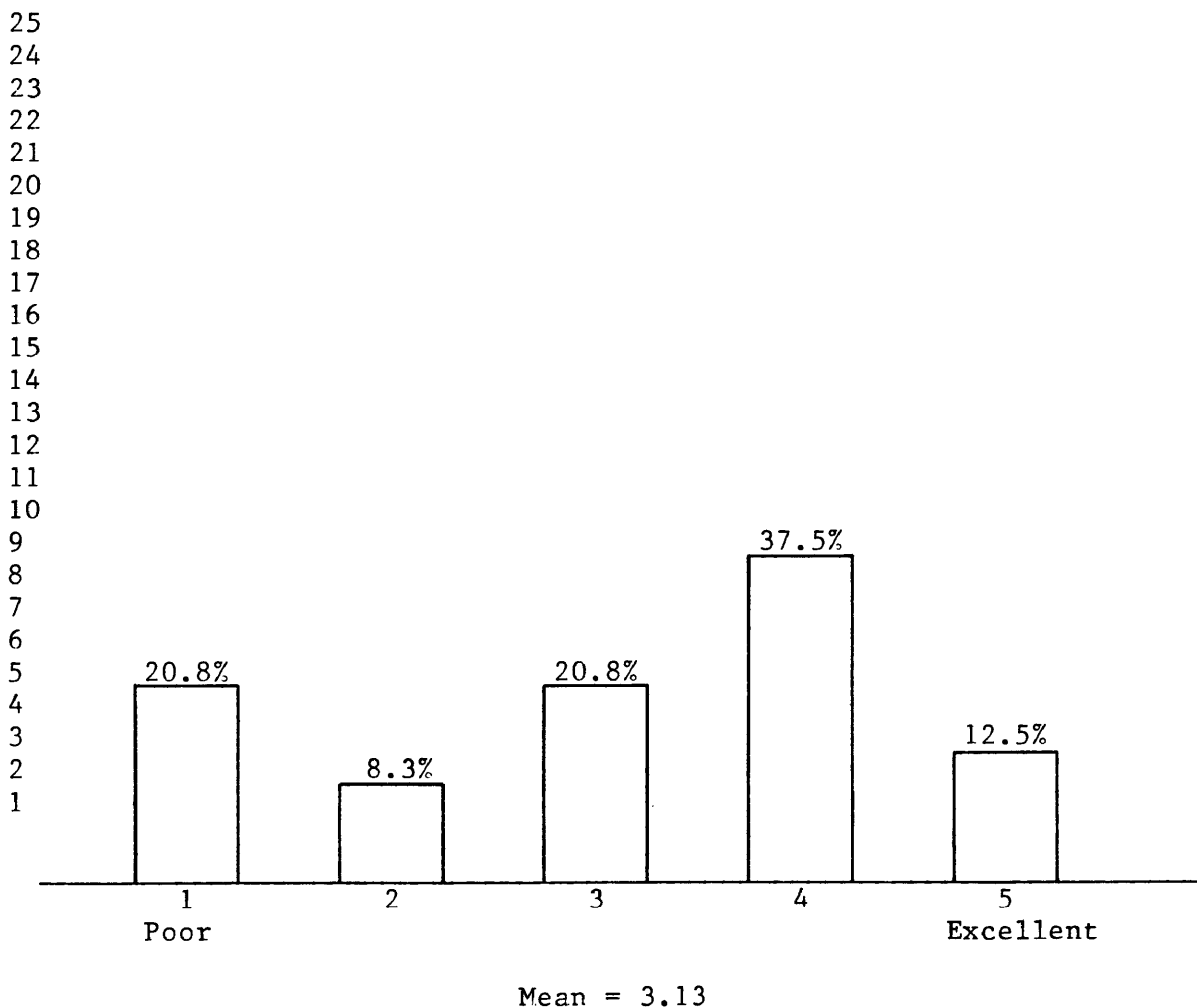
Visual Relevancy

Questions 10, 13 and 14 dealt with the relevancy of the visuals utilized in the sample programs viewed.

Question 10

Question number 10 examined the degree to which the visual communication matched the audio communication. Ten responses, 41.7%, indicated a relationship between the visual and audio messages which was fairly close to emphasize key points. Ten, or 41.7%, found these messages to be the same exactly and in detail. Three, or 12.5%, found the messages to sometimes to be the same, while one, or 4.2%, found that the messages were the same once in a while. The "not at all" response was left unanswered. Table 4.22 summarizes these data.

TABLE 4.22

DEGREE TO WHICH VISUAL COMMUNICATION MATCHES AUDIO
COMMUNICATION IN SAMPLE MEDIA PROGRAMS

Degree of Similarity	Number of Responses	Percent of Total
Exactly and in Detail	10	41.7
Fairly closely to Emphasize Key Points	10	41.7
Sometimes	3	12.5
Once in a While	1	4.2
Not at All	0	0
	24	100

Question 13

Question number 13 examined the continuity among visuals used in the sample programs. This question also used the Likert-type rating scale. Twelve responses, or 50.0%, indicated good continuity, while six, or 25.0%, found an average degree of continuity among visuals. Five, or 20.8%, indicated an excellent level of visual continuity, while one, or 4.2%, found poor use of this technique. No responses were given in the fair category. Figure 4.5 illustrates these data.

FIGURE 4.5

VISUAL CONTINUITY IN SAMPLE MEDIA PROGRAMS

Mean = 3.83
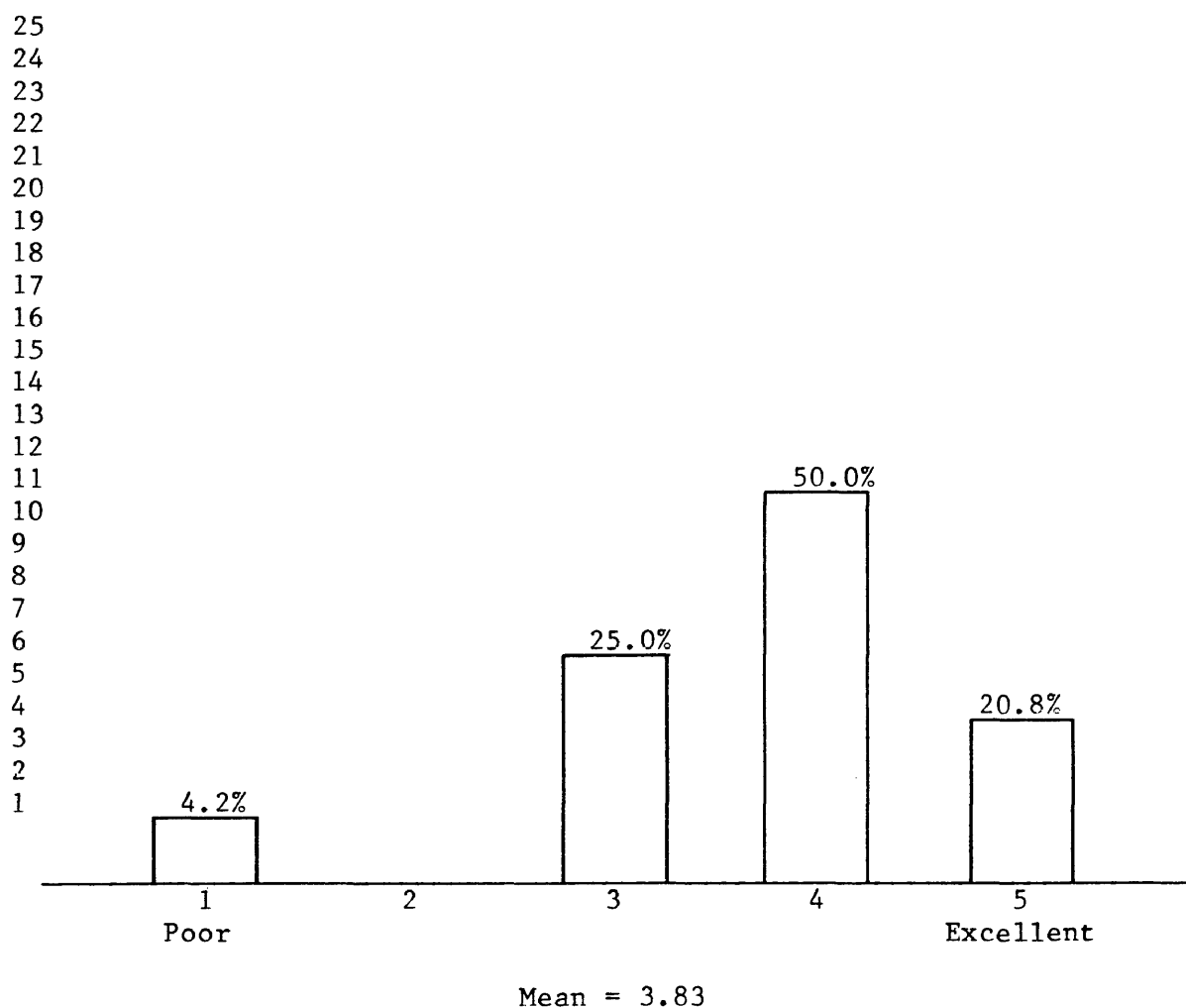
Question 14

Question number 14 determined the overall creativity/originality of visuals used in these programs. The question also utilized the Likert-type rating scale. Twelve responses, or 50.0%, found a good sue of visual creativity, while seven, or 29.2%, indicated an average level of visual creativity/originality. Three, or 12.5%, were given in the fair category, while two, or 8.3%, indicated a poor level of visual creativity. No responses were given in the excellent category. Figure 4.6 illustrates this distribution.

FIGURE 4.6

CREATIVITY/ORIGINALITY OF VISUALS IN
SAMPLE MEDIA PROGRAMS

Mean = 3.21
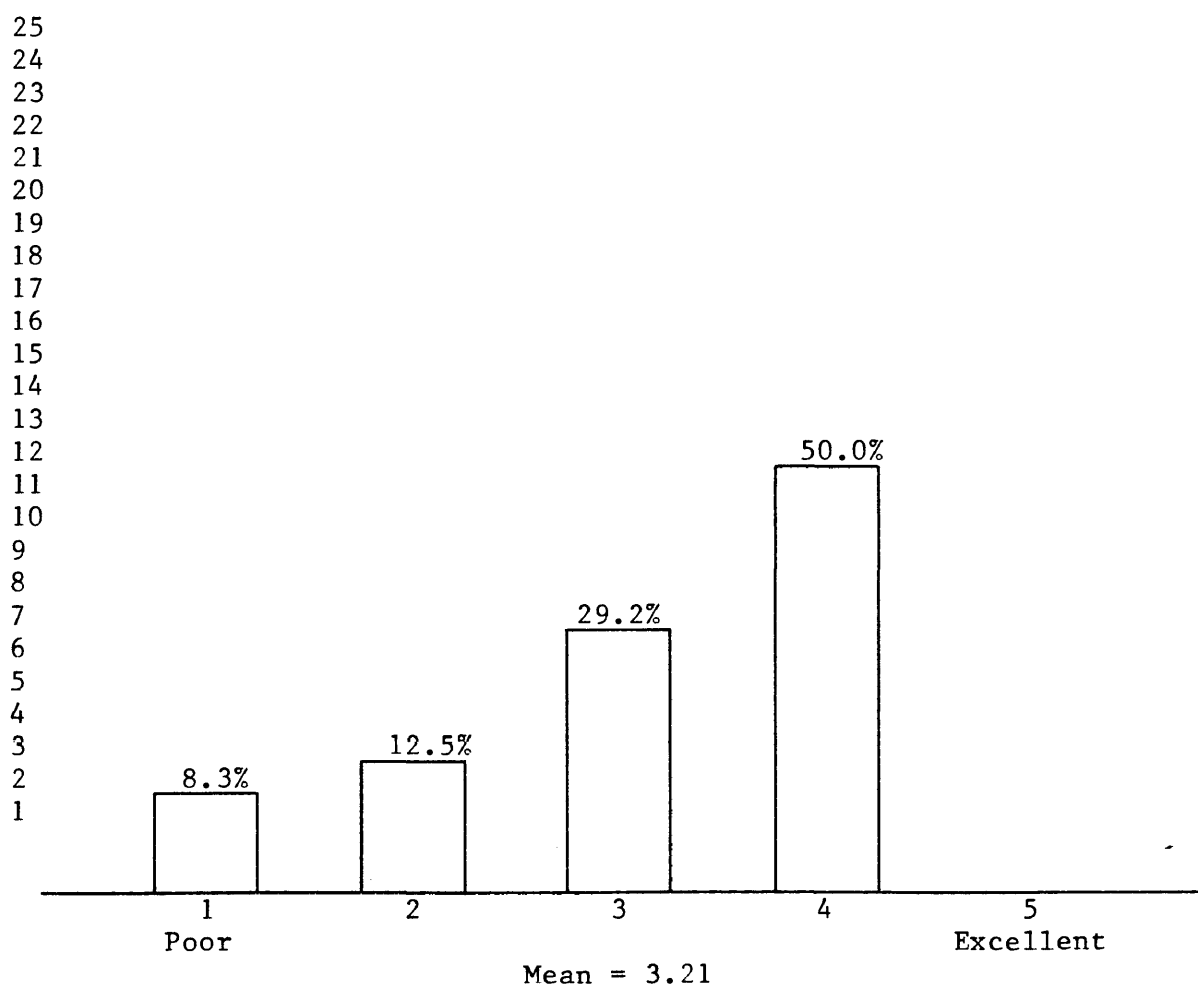
Limiting Information

Questions 12 and 15 examined the extent to which visuals limited the amount of information they contained.

Question 12

This question determined the appropriateness of visual pacing used in the sample media programs. Sixteen responses, or 66.7%, indicated the length of time visuals appeared on the screen was just right. Seven, or 29.2%, indicated they appeared for too long a time. One, or 4.2%, found the visuals appeared on the screen a combination of too long and too short a time, while no responses indicated visuals appeared for too short a time. Table 4.23 illustrates these data.

TABLE 4.23

VISUAL PACING USED IN SAMPLE MEDIA PROGRAMS

Time Appropriateness	Number of Responses	Percent of Total
Just Right	16	66.7
Too Long	7	29.2
Combination Too Short/ Too Long	1	4.2
Too Short	0	0
	24	100

Question 15

Question number 15 asked if sample programs met their learning objectives. This question also used a Likert-type rating scale. Twelve responses, or 50.0%, indicated programs did a good job of meeting their objectives, while seven, or 29.2%, indicated an average level. Four, or 16.7%, found a fair level of meeting the learning objectives, while one, or 4.2%, indicated a poor level. No responses were given in the excellent category. Figure 4.7 shows this distribution.

FIGURE 4.7

LEVEL OF COMPETENCE IN MEETING LEARNING
OBJECTIVES IN SAMPLE MEDIA PROGRAMS

Mean = 3.25
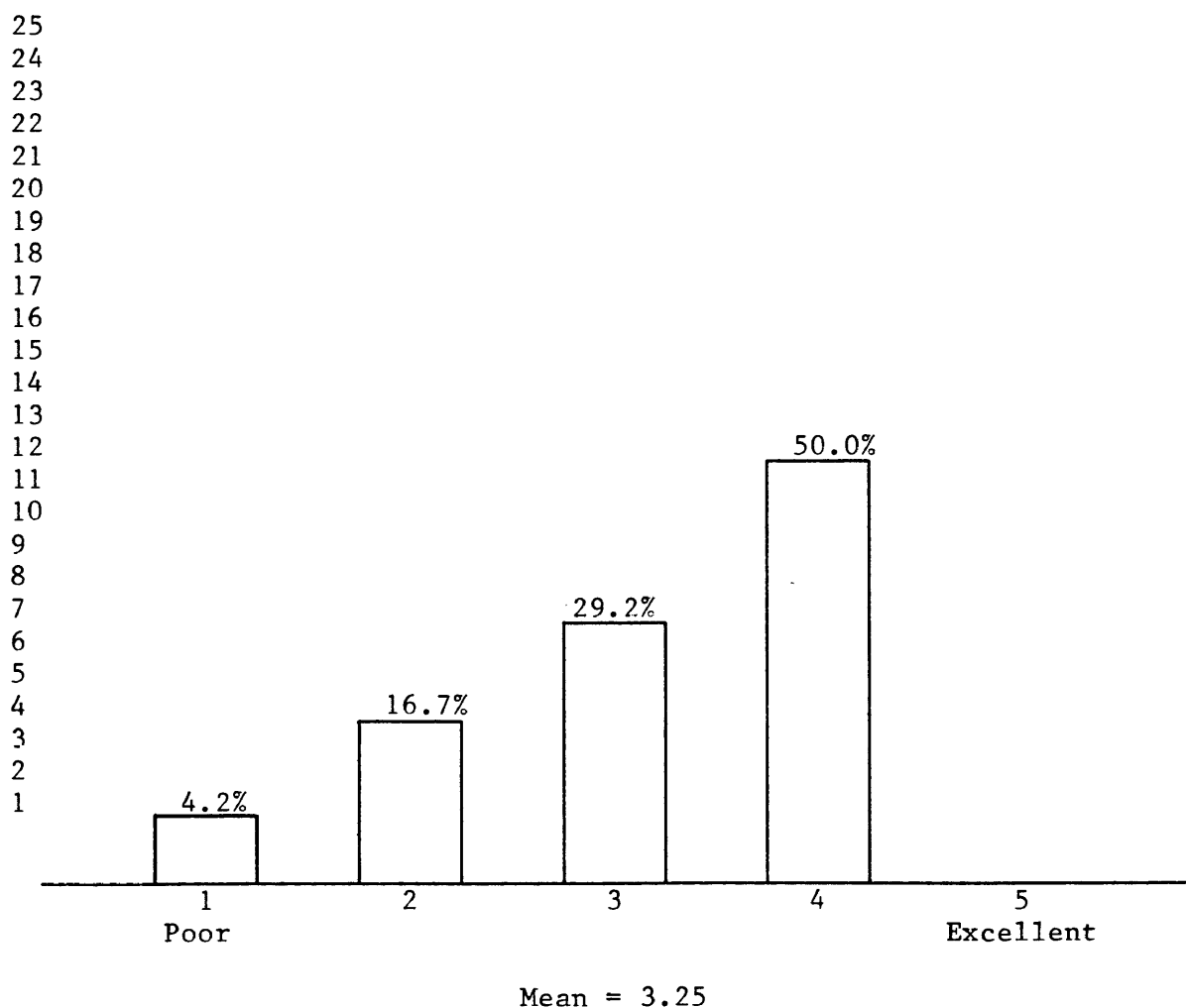
CHAPTER V

SUMMARY AND CONCLUSIONS

Introduction

With the recent changes in government regulations concerning cost reimbursement to hospitals and the growing trend on the part of people not to be admitted to a health care facility, hospitals are faced with the challenge of cutting costs. Education and training departments also must trim their budgets and adopt methods of doing more with less.

Educational media programs are one way of communicating the vast amount of medical information to a group or to individuals at times convenient to them. Furthermore, the information can be presented in a concise manner without risk of omitting key details. For these reasons, it could be a cost effective method of providing educational opportunities. However, even though the use of educational media in hospitals is growing, it is still a relatively new concept, and many of the people who currently work in the area of health care education may not be trained to design and produce the kinds of sophisticated visual media programming today's society is attuned to. Although their medical and written communication skills may be excellent, the ability to produce effective audiovisual programs may be lacking.

There was need to determine the current applications and capabilities of Nebraska's health care educators in the area of media production. This study focused upon examining if educational media programs were produced through Nebraska hospital education and training departments and how well these programs utilized proven principles of visual communication.

This chapter presents an overview of the present study in terms of: 1) Purpose, 2) Methodology, 3) Findings and 4) Implications.

Purpose

The purpose of this study was to examine the ability of education and training departments in Nebraska hospitals to design and produce effective educational media programs. The study included investigation into the ability of departments to produce slide/audiotape or videotape programs, the number of staff members in departments, the educational backgrounds of these staff members and the use of proven visual communication principles in designing and producing media programs.

More specifically, this study focused on the following questions:

1) Do Nebraska health care educators possess knowledge of visual communication principles as applied to media programming?

2) What are the formal educational backgrounds of educators working in the field?

3) What continuing education have these educators received regarding visual communication and media program design?

4) How do these educators use visual communication principles in the design of media presentations used by their institutions?

5) How effective are the visuals used in these media programs?

Research Methodology

To gather the necessary information which was required to accomplish the goals of this study, descriptive data were needed. The information was collected through two means. A questionnaire and a rating form were constructed.

Sample

The population which was used for this study included the directors of education and training departments in all Nebraska hospitals. Research data was gathered from fifty-eight respondents to the mailed questionnaire. Of these fifty-eight, twenty-four indicated the capability to produce media programs. Eight sample programs from this population were used to gather data concerning their use of visual communication principles.

Research Instrument

The two instruments used for the present study consisted of a twelve item questionnaire and a fifteen item rating scale which were constructed for this study. The questionnaire and rating scale were constructed and then presented for feedback to a panel of three people: two of whom held advanced degrees and the third was an experienced media specialist in an educational, medical setting.

Study Limitations

The following are recognized limitations of this research:

1) This study involved only those health care educators who are manager/directors of education or inservice education departments in hospitals located in the state of Nebraska.

2) This study was subject to those constraints inherent in a descriptive study such as use of qualitative data.

Summary of Findings

Each of the respondents in this study managed a hospital education and training department. However, many departments were found to have only one or two staff members. Many did not produce their own audio-visual presentations.

Of the total population of one hundred and eight managers/directors, fifty-eight responded to the questionnaire. Of these fifty-eight, twenty-four indicated the capability to produce media programs. Of these twenty-four, ten voluntarily indicated their production was limited to videotaping lectures or inservices with one camera, and that they did not have the capability to edit or duplicate videotapes.

Demographic Data

The majority of hospitals responding, 58.6%, were publicly owned facilities. The average bed size was 105 beds. Overwhelmingly, the average size education and training department contained one to two staff members (74.5%). 12.7% of the responding departments contained three to five people, 9.1% contained six to ten people, and only 3.6% of the departments contained 11-15 staff members.

The highest educational degrees achieved by staff members included 11.1% with a high school degree; 27.2% with associate degrees, including RN degrees; 42.1% with the bachelor degrees; and 21.8% with advanced degrees.

Nursing degrees, including LPN, RN and BSN degrees, comprised 39.9% of the educational backgrounds of staff members in the fifty-eight departments. Arts and sciences degrees, including journalism, communication or media production majors, included 23.3% of the overall total, while education degrees comprised 17.5% of the total. Medicine, health and business degrees added up to 12.5% of the total.

Finally, data indicated only 11.1% of the staff members of responding departments had attended over ten continuing education sessions geared toward audiovisual production, while 42.6% had attended no sessions on this subject. 33.3% had attended only one to two such sessions, while 9.3% had attended three to five sessions and 3.7% had attended six to ten sessions.

These combined data indicate a general lack of exposure to communication, education or media production principles. It also suggests that department size would, in some cases, make media program design impossible because of the staff time needed for this task.

Educational Activities

Of the responding departments, 82.5% indicated they spend between 0-24% of their time designing media programs, while 14.0% indicated media production at 25-49% and 3.5% of the departments indicated this task took up to 50-74% of their total time. No departments indicated that media production exceeded 74% of their total activity time.

When asked what types of educational activities they most often provided to their organizations, 96.6% said they provided inservice education. Patient education was indicated by 34.5%, while management training included 15.5% of the departments. Community education was indicated by 13.8%, orientation activities by 13.8%, and specific training by request by 10.3% of the departments.

Media program design included 6.9% of the total departments, while educational training for degrees also was indicated by 6.9%. Library services was indicated by 3.4% of the departments surveyed.

Of departments who produce media programs, 20.8% indicated the scriptwriter was responsible for planning visuals used in programs. Other persons responsible included outside specialists (12.5%), directors of nursing (8.3%), instructors (8.3%), photographers (4.2%), or combinations including the educational consultant and media specialist (20.8%), educational staff and nursing staff (8.3%), scriptwriter and content specialist (8.3%), and content specialist and media specialist (4.2%).

Designing art visuals was the responsibility of either an outside specialist (21.7%), artist (13.0%), scriptwriter (4.4%), photographer (4.4%), director of nursing (4.4%), instructor (4.4%), or a combination

of staff people, including the educational staff and the nursing staff (21.7%), the educational consultant and media specialist (13.0%), photographer and content specialist (8.7%), and scriptwriter and outside specialist (4.4%).

Designing photography visuals used in media programs was the responsibility of either a photographer (34.8%), outside specialist (26.1%), instructor (4.4%), hospital specialist outside the department (4.4%), or a combination of staff people, including the educational staff and nursing staff (13.0%), educational staff and media specialist (8.7%), photographer and content specialist (4.4%), or scriptwriter, artist and content specialist (4.4%).

Of the departments that responded, 58.6% indicated they did not have the capability to produce media programming. Of those surveyed, 41.4% indicated they did have this capability.

From these data it can be inferred that media program design is an important activity to a fairly small, select number of departments who have not only the equipment, but also the manpower available to effectively handle this task. However, many of the other major activities listed, such as inservice education and patient education, might be accomplished as easily through media presentations of the material and should be explored as an alternative. Possibly this could be more cost effective in the long run than having to present the same information over many times.

Education Department Staff and Media Programming

Of the twenty-four respondents who indicated their departments do production, eight sent programs for use in the study (six videotapes and two slide/audiotapes). Of those sixteen departments who did not submit a program for study, ten, or 63.0%, indicated they did not have copies available and had no way to duplicate them. Four of these ten, or 25.0%, further indicated they videotape only lectures and inservices for later viewing.

Unlike the departments who do not produce media programs, those that have that capability include an average of 8.25 staff people per department. The educational backgrounds of these people are varied and include many fields relevant to media production, including 25.8% with education backgrounds and 33.3% with arts and sciences backgrounds including degrees in journalism, communication, public relations and media production. Only 12.1% of these people held nursing degrees, while 4.5% held medical degrees, 4.5% had degrees in the health field and 19.7% had no specialty indicated.

Average bed size of these eight hospitals was 346, compared to 105 for all respondent hospitals.

These data indicate that larger hospitals are able to gain access, either through buying or renting, to the equipment necessary for media production. These data also indicate that a larger department containing staff people with more varied backgrounds is necessary for educational media programming to take place in a hospital setting.

Visual Communication Principles and Media Program Design
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In Chapter II several guidelines were presented that research has shown to be beneficial to the design of visuals contained in educational media programs.

1. The level of realism contained in visuals should take into account a program's content, learning objectives and intended audience.

Ten responses, 41.7%, indicated the level of realism used in visuals in the sample media programs was good. Eight responses, or 33.3% rated this as excellent. Four ratings, or 16.7%, indicated an average use of realism, while two responses, or 8.3%, were rated below average.

All of the sample programs contained either photographs/moving pictures (54.2%), a combination of words and photographs/moving pictures (33.3%), or a combination of detailed shaded drawings and still/moving pictures (12.5%). Overwhelmingly, the information was of a general introductory nature (50.0%), although many responses indicated the presence of step-by-step information (37.5%), terminology/component teaching information (8.3%) and attitude building information (4.2%).

There was a fairly even split among intended audiences, including health professionals (41.7%), patients (33.3%), and the general public (25.0%).

These data show a lack of use of nonrealistic visuals for appropri-
ate programs of a step-by-step or terminology/component teaching nature
when aimed at health professionals and patients.

2.   The medium selected should complement the program content and
     learning objectives.

In this category, excellent responses received 33.3% of the rat-
ings, good responses 41.7%, average responses 12.5%, fair responses
4.2%, and poor responses 8.3%.   From this finding it can be assumed that
although the majority of the responses indicated an above average
appropriateness of format selected, the several low responses indicate a
need for health care educators to consider this guideline with each
program designed.

3.   Visually comparing unfamiliar objects with familiar objects
     can aid learning.

From the responses, 41.7% found this guideline to be not applicable
to the sample programs viewed.   However, where it was an applicable
guideline, it was never utilized 33.3% of the time.   Visual comparison
was used almost never 8.3%, sometimes 8.3%, and almost always only 8.3%
of the time.   It was never used where always applicable.   This finding
indicates either a lack of knowledge about this guideline or a refusal
to use this proven visual technique.

4.   Using a subjective point of view in visuals increases learner
     perception of the way objects appear in the real world.

Another visual learning technique that appears to be lacking in most media programs designed and produced by Nebraska health care educators is the use of a subjective point of view for the camera angle.

To support this reasoning, 29.2% of the rating responses found that a subjective viewpoint was never used, while 12.5% found it was almost never used, and 20.8% said it was used only sometimes. 20.8% indicated the subjective point of view was utilized almost always, and 16.7% found this technique not applicable. No responses indicated this technique was utilized in every situation where it could have been employed.

5. Visual cueing with simple, clear graphics directs the learner to the intended communication.

Visual cueing with graphics was not present in five, or 62.5%, of the programs, while it was used in three, or 37.5%, of the programs. The most common utilization of visual cueing included use of word labelling (nine responses) and word statements (five responses). Color highlighting received three responses, and arrows were indicated in three responses. Two other responses indicated the use of a symbolic graphic and use of an animated character pointing.

Use of graphic visual cues, where present, indicated a good use of technique 55.6% of the time, fair use 22.2% of the time and average use of the technique 11.1% of the time. An excellent rating was given 11.1% of the time, while no responses indicated a poor level of usage of this technique.

The use of photographic cueing techniques include a wide range of responses, including 37.5% which indicated a good use of this technique and 20.8% which indicated poor use of this type of cueing. Average use received 20.8% of the scores, while the excellent category received 12.5% of the responses and the fair category received 8.3%.

These data indicate a lack of wide utilization of this technique, both in graphic and photographic cueing. Although some of the sample programs contained above average use of cues, many did not take advantage of this proven technique.

6. Visuals should be relevant to the audio message, but should not exactly duplicate what is being stated.

In support of this guideline, 14.7% of the responses indicated that visuals followed the audio message closely to emphasize key points. 14.7% found the visuals matched exactly and in detail, while 12.5% indicated they only followed the audio sometimes. One response, 4.2%, indicated the visual varied greatly from the audio and matched it only one in a while.

Because visuals were often used to emphasize key points in the audio message, it probably led to the overwhelmingly favorable responses for visual continuity--good 50.0%, excellent 20.8%, and average 25.0%. Only one response, 4.2%, indicated a below average use of this technique.

Likewise, the use of visual creativity rated good 50.0%, average 29.2%, fair 12.5%, and poor 8.3% of the time. No responses indicated an excellent use of visual creativity or originality. Possibly the use of even less visual and audio matching and more use of guidelines such as

graphics and photographic techniques might have brought more of these programs up to excellent ratings in these categories.

7.   Information presented should be limited to one idea per visual and one main concept per program.

The amount of time visuals were left on the screen was indicated to be just right 66.7% of the time, while 29.2% of the responses found visuals appearing for too long a time.   4.2% indicated visuals appeared a combination of too short and too long a time.   By leaving the camera on a visual for too long, many interesting visual details may have been omitted, which could account for why no programs received excellent ratings in how well they met their learning objectives.   However, 50.0% of the responses indicated a good level of meeting objectives, while 29.2% rated as average, 16.7% rated fair and 4.2% rated poorly.

Implications and Conclusions

Instructional media programming has the potential for being a valuable tool for educators in hospitals. Due to the fact hospitals are becoming more cost conscious in a time when educational demands are increasing, media programs could be of immense value to the in-house educator.

However, this study indicates that at this point in time the capability to design and produce media programs for educational purposes is lacking two important components--the necessary equipment and staff knowledge of visual communication principles which contribute to an educationally effective presentation. The fact that only 41.4% of the respondents indicated having the necessary equipment to produce media programs supports this conclusion, as does the further realization that at best only 14 of the 58 hospitals own equipment or have access to equipment for editing or duplicating copies of videotape and slide/audio-tape programs. This number may even be high since specific data were not gathered on this topic.

Hospitals would have to invest in this equipment and the technical people to maintain it, or would have to contract for these services, before real production could take place. Furthermore, the number of one and two person departments could make the time factor for producing media an important consideration.

However, because media programs are not being utilized by most hospital education and training departments in Nebraska, health care educators could be taking a longer time than necessary to effectively teach all of the people who rely on this kind of information. Media

programming might be an effective way to provide information at times convenient to the learner and the educator, while not requiring a lapse of time to pass before a class is offered or requiring that an instructor takes up valuable time in order to impart the knowledge to learners. Furthermore, it might be a more effective way of transmitting information than lecturing would be because people in today's society, and especially in the medical field, are attuned to acquiring information from audiovisual media.

The lack of department personnel trained in education, communication or media production also indicates that many of the proven principles for effective media programming are not understood or known about by many of today's health care educators. Although several programs viewed were rated as good overall, before wide use of media programming is begun, a basic knowledge of scripting and production techniques should be achieved by all health care educators to ensure the highest quality programming. This could be done through college courses, continuing education courses, printed literature or guidelines set by health care educators.

Recommendations for Future Study

The following recommendations for future study emerged as this research project progressed:

1. A study should be made to determine if significant learning is occurring as a result of hospital educational media programming which encompasses the visual communication principles identified.

2. A study could be undertaken to determine what factors need to be present to create a statewide coordinating agency for media programming for health care.

3. A study should be performed to determine the cost effectiveness of media production in a health care setting versus didactic teaching in a health care setting.

Recommendations for Application

The following are recommendations for application of media programming for educational purposes in a hospital setting:

1. Hospitals should determine if sufficient equipment is available for the production of this technology.

2. Hospitals should determine if there is educated staff available to design and produce effective media programming.

3. Hospitals need to consider if there is a sufficient number of staff available to design its own media programs or if a rental or sharing system would be more cost effective.

4. Hospitals should consider if there is sufficient need for the use of this technology: i.e., does the fact that media programming can provide concise information at convenient times outweigh the equipment and staff problems associated with it?

5. Health educators who design and produce educational media should devise ways to utilize artwork and graphics, visual cueing, visual comparisons, subjective camera angles, and creative visuals to enhance the audio messages contained in these programs whenever applicable.

6. Hospitals producing media programs should support college education and continuing education opportunities on this subject for staff members responsible for designing and producing effective educational media.

7. Those health care educators producing effective educational media should consider presenting inservices or publishing and distributing printed guidelines concerning educational media production principles to their peers in an effort to increase and improve this form of communication.

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APPENDIX A

January 2, 1985

Dear Director of Education and Training:

As I'm sure you know, health care educators face many challenges brought on by both the increased technology of the information age and budgetary restrictions due to government regulations.

As both a health care educator at Omaha's Clarkson Hospital and a graduate student in communication at the University of Nebraska at Omaha, I have a keen interest in the work of health care educators throughout the state of Nebraska.

I am currently collecting research data from directors and manager of hospital education and training departments as to their present needs and capabilities for audiovisual program design. In particular, I am looking at the visuals used in audiovisual media presentations produced by Nebraska hospital education departments. This data will be helpful in predicting whether health care educators in our state will need both more equipment and more training in visual communication principles as we see society's visual sophistication increase.

Your participation, assuming you are able to help, includes two items. First, please fill out the enclosed questionnaire and be sure to check whether or not your department produces audiovisuals and if a sample of a typical program (either slide/tape, vidoetape, or filmstrip) produced by your department could be sent for use in this study. Please return the completed questionnaire in the envelope provided within ten days.

If you are able to send a program, I will send a mailing envelope addressed to me for the program. When I receive the program, I will be looking at it in terms several visual criteria. Your program will be returned to you within ten days.

Participants in this study will be kept confidential when the final report of data is made. However, a numbering system will be used to enable me to find questionnaires that have not been returned. After I have received a response, the numbering system will be dropped from the questionnaire and program form, and all data will be treated completely confidentially.

I will be glad to share the results of this study with all participating hospitals who request it.

Thank you for your participation in this study. I encourage you t please take a few minutes right now to complete this important question-naire.

Sincerely,

Susan R. Raftery
UNO Graduate Student &
Educational Consultant,
Clarkson Hospital

Nebraska Hospital Education and Training Departments

Please mark each response that best describes your department.

1. Type of organization you work for:

    _____ Privately owned hospital - Number of beds _____

    _____ Publicly owned hospital - Number of beds _____

    _____ Health care facility other than a hospital
           Number of beds _____

2. Estimated percentage of time your department spends designing and
    producing mediated programs for education or training:

    _____ 0 - 24%

    _____ 25 - 49%

    _____ 50 - 74%

    _____ 75 - 99%

    _____ 100%

    Please list the three main types of educational activities your depart-
    ment provides to your organization: (e.g. inservice education, manage-
    ment training, media program design, etc.)

    1. _____

    2. _____

    3. _____

3. Who plans for the visuals used in your department's mediated programs?

    _____ Educational scriptwriter/designer
    _____ Artist
    _____ Photographer/media specialist
    _____ Content specialist outside the department
    _____ A combination of the _____ and _____
    _____ Outside specialist

4. Who designs the art visuals used in your department's mediated programs?

    _____ Educational scriptwriter/designer
    _____ Artist
    _____ Photographer/media specialist
    _____ Content specialist outside the department
    _____ A combination of the _____ and _____
    _____ Outside specialist

5. Who designs the photography visuals used in your department's mediated programs?

    _____ Educational scriptwriter/designer
    _____ Artist
    _____ Photographer/media specialist
    _____ Content specialist outside the department
    _____ A combination of the _____ and _____
    _____ Outside specialist

6. How many people, including yourself, work in your department? (Please omit clerical staff.)

    _____ 1-2
    _____ 3-5
    _____ 6-10
    _____ 11-15
    _____ 16-20
    _____ 21-25
    _____ Over 25

7. Please list the highest educational degree and major field of study each member of your department holds:

	Degree	Major Field of Study	Don't Know
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

8. As far as you know, how many continuing education activities dealing with media program design have you or a member of your staff attended:

    _____ 0
    _____ 1-2
    _____ 3-5
    _____ 6-10
    _____ Over 10

9. Does your department produce its own mediated programs (videotapes, slide/tapes)?

    YES _____   NO _____

10. If you do produce your own media, would you send a sample of one of your typical media programs if a stamped mailing envelope was sent to you?

    YES _____   NO _____

APPENDIX B

RATING SCALE
USE OF VISUALS IN MEDIATED INSTRUCTIONAL PROGRAMS

Program Title:_____

Please circle the number that best describes the program.

1. The content of the presentation fits the media format chosen:

    _____excellent
    _____good
    _____average
    _____fair
    _____poor

2. Content can best be described as:

    _____general introductory information
    _____step-by-step process (how-to)
    _____terminology/component teaching
    _____attitude building/motivational information
    _____other:_____

3. Visuals used are primarily:

    _____simple line drawings
    _____detailed shaded drawings
    _____photographs
    _____words only
    _____a combination of two of the above (please specify)
    _____

4. Intended audience:

    _____health professionals
    _____patients
    _____general public
    _____not evident
    _____other:_____

5. Realism level of visuals fits presentation content, objectives and
    audience:

    _____excellent
    _____good
    _____average
    _____fair
    _____poor

6. Graphic visual cues are included in the program:

_____ Yes _____ No

If yes, what kind of visual cues?

_____circling the center of interest
_____color highlighting
_____word labeling
_____word statements
_____arrows
_____other (please describe)_____

7. Graphic visual cues used are effective in directing learner attention to intended visual communication?

_____excellent
_____good
_____average
_____fair
_____poor

8. Objects that may be unfamiliar to the audience are visually compared with objects that are probably more familiar to them:

_____always
_____almost always
_____sometimes
_____almost never
_____never
_____not applicable in this situation

9. Visuals use a subjective point of view (as the learner would see the object as he/she used it):

_____always
_____almost always
_____sometimes
_____almost never
_____never
_____not applicable in this situation

10. Visuals match the audio:

_____exactly and in detail
_____fairly closely to emphasize key points
_____sometimes but not always
_____once in a while
_____not at all

11. Photographic elements (such as use of contrast, depth of field, leading lines, and lighting) are used as visual cues to direct learners to the intended centers of interest:

_____excellent
_____good
_____average
_____fair
_____poor

12. Pacing (time length each visual appears is appropriate for the visual content included):

_____just right
_____too short of a time
_____too long of a time
_____a combination of too short/too long of a time

13. Continuity among visuals:

_____excellent
_____good
_____average
_____fair
_____poor

14. Creativity/originality of visuals:

_____excellent
_____good
_____average
_____fair
_____poor

15. Program meets its learning objectives:

_____excellent
_____good
_____average
_____fair
_____poor

APPENDIX C

NEBRASKA HOSPITALS

Ainsworth
    Brown County Hospital

Albion
    Boone County Community Hospital

Alliance
    Box Butte General Hospital

Alma
    Harlan County Hospital

Atkinson
    West Holt Memorial Hospital

Auburn
    Nemaha County Hospital

Aurora
    Memorial Hospital

Bassett
    Rock County Hospital

Beatrice
    Beatrice Community Hospital and Health Center

Benkelman
    Dundy County Hospital

Blair
    Memorial Community Hospital

Bridgeport
    Morrill County Community Hospital

Broken Bow
    Jennie M. Melham Memorial Medical Center

Burwell
    Community Memorial Hospital

Callaway
    Callaway Hospital

Cambridge
    Cambridge Memorial Hospital

Central City
    Litzenberg Memorial County Hospital

Chadron
    Chadron Community Hospital

Columbus
    Columbus Community Hospital

Cozad
    Cozad Community Hospital

Crawford
    Community Memorial Hospital

Creighton
    Lundberg Memorial Hospital

Crete
    Crete Municipal Hospital

David City
    Butler County Hospital

Fairbury
    Jefferson County Memorial Hospital

Falls City
    Community Hospital

Franklin
    Franklin County Memorial Hospital

Fremont
    Memorial Hospital of Dodge County

Friend
    Warren Memorial Hospital

Fullerton
    Fullerton Memorial Hospital

Geneva
    Fillmore County Hospital

Genoa
    Genoa Community Hospital

Gordon
    Gordon Memorial Hospital

Gothenburg
    Gothenburg Memorial Hospital

Grand Island
    Lutheran Memorial Hospital

    Saint Francis Medical Center

    Veterans Administration Medical Center

Grant
      Perkins County Community Hospital

Hastings
      Hastings Regional Center

      Mary Lanning Memorial Hospital

Hebron
      Thayer County Memorial Hospital

Henderson
      Henderson Community Hospital

Holdrege
      Phelps Memorial Health Center

Humboldt
      Community Memorial Hospital

Imperial
      Chase County Community Hospital

Kearney
      Good Samaritan Hospital

Kimball
      Kimball County Hospital

Lexington
      Tri-County Area Hospital

Lincoln
      Bryan Memorial Hospital

      Lincoln General Hospital

      Lincoln Regional Center

      St. Elizabeth Community Health Center

      Veterans Administration Medical Center

Loup City
      Sacred Heart Hospital

Lynch
      Niobrara Valley Hospital

McCook
      Community Hospital

Minden
      Kearney County Community Hospital

Mullen
   Pioneer Memorial Hospital

Nebraska City
   St. Mary's Hospital

Neligh
   Antelope Memorial Hospital

Norfolk
   Lutheran Community Hospital

   Norfolk Regional Center

   Our Lady of Lourdes Hospital

North Platte
   Great Plains Medical Center

O'Neill
   St. Anthony's Hospital

Oakland
   Oakland Memorial Hospital

Offutt Air Force Base
   Ehrling Bergquist U.S. Air Force Regional Hospital

Ogallala
   Ogallala Community Hospital

Omaha
   Archbishop Bergan Mercy Hospital

   Bishop Clarkson Memorial Hospital

   Boys Town Institute for Communication Disorders

   Childrens Memorial Hospital

   Douglas County Hospital

   Ehrling Berquist U.S. Air Force Regional Hospital

   Immanuel Medical Center

   Lutheran Medical Center

   Methodist Hospital

   Nebraska Psychiatric Institute

Saint Joseph Hospital

University Hospital and Clinic University of Nebraska

Veterans Administration Medical Center

Ord
    Valley County Hospital

Osceola
    Annie Jeffrey Memorial County Hospital

Oshkosh
    Garden County Hospital

Osmond
    Osmond General Hospital

Oxford
    Fritzer Memorial Hospital

Papillion
    Midlands Community Hospital

Pawnee City
    Pawnee County Memorial Hospital

Pender
    Pender Community Hospital

Plainview
    Plainview Public Hospital

Red Cloud
    Webster County Community Hospital

Rushville
    Rushville Community Hospital

Sargent
    Sargent District Hospital

Schuyler
    Memorial Hospital

Scottsbluff
    West Nebraska General Hospital

Seward
    Memorial Hospital

Sidney
    Memorial Hospital and Home

St. Paul
      Howard County Community Hospital

Superior
      Brodstone Memorial Nuckolls County Hospital

      Community Memorial Hospital

Tecumseh
      Johnson County Hospital

Tilden
      Tilden Community Hospital

Valentine
      Cherry County Hospital

Wahoo
      Saunders County Community Hospital

Wakefield
      Wakefield Healthcare Center

Wayne
      Providence Medical Center

West Point
      St. Francis Memorial Hospital

Winnebago
      U.S. Public Health Service Indian Hospital

York
      York General Hospital