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THE USE OF DETAIL AND BACKGROUND IN VISUALS AND ITS EFFECT ON L--ETC(U)
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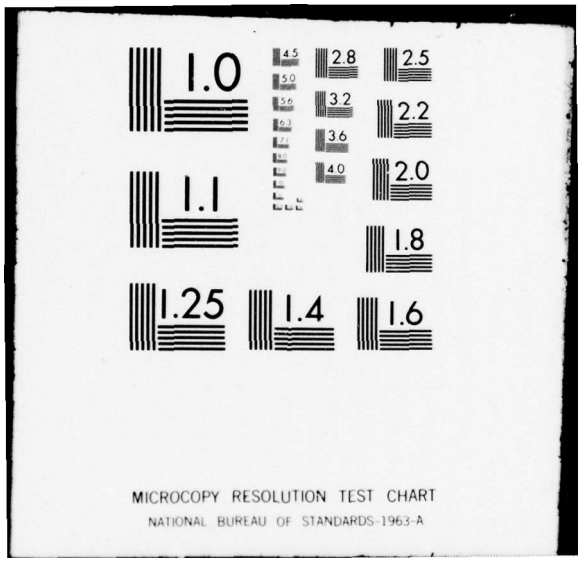
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The Use of Detail and Background in Visuals and Its Effect on Learner Achievement and Attitude

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U.S. Army Training Support Center

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Abstract

The goal of this research was to determine whether subjects completing a simplified version of a TEC lesson would differ in achievement or attitude from comparable subjects who completed a more complex version of the same lesson.

Both lessons were in the conventional audiovisual format used for most TEC lessons. The audio part of the two versions was identical but the visuals on the revised filmstrip were simplified by such changes as removing background, removing uniform details from soldiers, and sketching equipment rather than drawing it to scale.

Eighty soldiers with the appropriate MOS were randomly assigned to simple and complex treatments. A pretest was given to estimate prior knowledge of the lesson content. After treatment, all subjects were administered two post tests dealing with lesson content and an attitude scale. The data were analysed using ANCOVA with GT score and pretest used as covariates and post tests and attitude scores used as dependent variables. None of the differences between the two treatment groups was statistically significant. Chi Square was used to analyse the individual attitude items. Only one item yielded a significant result, which favored subjects who were in the simple lesson treatment.

Although detailed cost comparisons cannot be made, the simple lesson resulted in a saving on art work of about 40% with no loss in either achievement or attitude. It is recommended that simple art be used to the greatest degree possible in future TEC lessons.

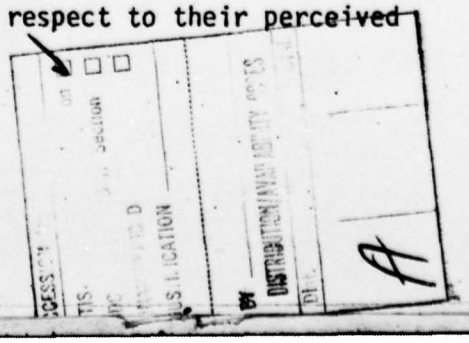
The Problem

This study was designed to determine whether the use of complex visual art which represents equipment to scale and human figures in great detail is more effective than simple visual art in terms of the content mastery and attitudes of individuals who are taught with these visuals. In 1972, the US Army Combat Arms Training Board initiated the development of TEC lessons. The first TEC lesson was ready for field use in 1974. There are currently 395 TEC lessons in the field including 322 that employ the audiovisual format studied in this research. This work is currently being carried on by the US Army Training Support Center at Fort Eustis, Virginia.

The typical TEC lesson includes a filmstrip cassette and an audio cassette that are designed for use in the BESSELER Cue-See projector. In this research a TEC lesson was selected which included a large percentage of complex visuals. These visuals were then examined carefully and a parallel set of simpler visuals was prepared. The main concern of this study was to compare the achievement and attitudes of comparable subjects who were trained using the simple and complex lessons.

The study was designed to test the following null hypotheses:

1. There will be no significant difference in the achievement of subjects who are taught the same concepts using two sets of visuals which differ in detail, complexity, accuracy of scale, and use of background.
2. In comparing subjects who have taken the two lesson variations, there will be no significant differences in their attitudes toward the visual aspects of the specific lessons or with respect to their perceived effectiveness of the TEC lesson format.



Previous Research

The justification for using large amounts of realistic detail in visual illustration is found in the theoretical work of Morris (1946) Carpenter (1953) and Dale (1954). Although differing considerably in detail, these various theoretical orientations can all be classified as realism theories (Dwyer, 1972). The basic assumption underlying all of these theories is that learning will be more complete as the number of cues in the learning situation increases. Therefore, an increase in realism in the visual portion of the TEC lessons would increase the number of cues in the learning situation and consequently should increase the probability that learning will be facilitated.

A review of research in this field, however, indicates that very few studies have been conducted which investigate the relative effectiveness of visual illustrations that employ different amounts of realistic detail and are used to complement oral instruction as is the case in the TEC lesson format. Two important early studies (Carpenter, 1954; Lumsdaine, 1958) employed filmographs to study simple versus complex motion picture film presentations. A filmograph is a simplified version of a motion picture film which is produced by using a motion picture camera to film either a series of still frames taken from the original motion picture or to film the storyboard from which the original motion picture was produced.

Carpenter (1954) prepared two filmographs from a sound motion picture film concerned with riot control for military trainees. One filmograph was based upon frames of the original motion picture while the other was shorter and was based on stock photographs which were substituted for complex mob scenes. Achievement gains and attitudes of subjects seeing the motion picture and the two filmographs were about the same. Carpenter

concluded that simplified visual presentations in the motion picture format were about as effective as more complex ones.

Gorman (1973) employed two black and white slide presentations to study the effects of pictorial detail on concept formation. One set of slides employed simple line drawings while the other sets employed detailed drawings. He developed a standardized set of instructions to employ in the treatments. He selected 150 5th, 9th, and 15th grade students for subjects in his study. There were no significant differences in the final performance of any of his groups.

Spaulding (1956) studied the performance of poorly educated adults in several countries and found that they had difficulty in interpreting complex illustrations. He concluded that pictorial complexity may reduce the "readability" of a picture in much the same way that idea density reduces the readability of printed material.

Wicker's (1970) research on paired-associate learning and the work of Paivio, Rogers, and Smythe (1968) concerned with free recall found that detailed pictures did not significantly improve learning as compared with simple line drawings.

Perhaps the most significant work in this area is a series of studies carried out by Dwyer (1972). In work that is closely relevant to the TEC lesson format, Dwyer developed a 2000 word instructional unit describing the human heart, its parts and the internal processes occurring during the systolic and diastolic phases. He then developed illustrations at different levels of complexity ranging from simple line drawings in black and white to realistic heart photographs in color. The two thousand word instructional unit was analyzed to locate critical information that could be illustrated in a visual treatment. Thirty-nine critical areas were identified and visuals

were designed specifically to illustrate the information in each critical area. The end result was eight complete visual sequences reproduced on 2 x 2 slides. Four of these sequences were in black and white and four were in color. All sequences employed the same 2000 words instructional content recorded on audiotape. Care was taken to be sure that the same format and size relationships that appeared in the original heart photographs were conveyed in the drawings. The same set of printed symbols was used in all experimental treatments and these were positioned in identical locations on each slide. A control treatment employed the audiotape with no visuals.

In order to determine which treatment was most effective in facilitating student achievement of specific educational objectives, four criterion measures were developed. These involved drawing, identification, terminology, and comprehension. Students were permitted to take as much time as was required to complete one criterion measure before proceeding to the next. The measures contained 18 to 20 items each and had reliability coefficients ranging from .76 for the comprehension test to .81 for the drawing test. The total criterion test consisting of the four individual tests contained 78 items and had a reliability coefficient of .91.

Three of Dwyer's studies are directly relevant to our research. In all three studies, subjects were randomly assigned to treatment and results were analysed using analysis of variance or analysis of covariance, depending on initial group differences. Each subject received a pretest, participated in his respective instructional treatment and was administered four individual criterion tests.

In Dwyer's initial study the control treatment, plus three black and white presentations were used. A sample of 108 college freshmen were randomly assigned to four treatment groups. In comparing the performance of the

four groups on the criterion measures it was found that the simple line drawing presentation was most effective for the drawing test, the identification test, and the total criterion score. The oral presentation (no visuals) was most effective for the terminology test and the comprehension test. Dwyer found that the more realistic illustrations i.e., shaded drawings and realistic photographs, were the least effective in complementing the oral instruction. In fact, they were no more effective than the oral instruction alone. Dwyer suggests that an undue amount of emphasis has been placed on the desirability of more realistic illustrations for instructional purposes.

In Dwyer's next study the nine treatments were administered to 1054 students in grades 9, 10, 11, and 12. At each grade level, each of nine classes was assigned at random to one of the treatment groups. A total of 20 comparisons were made to identify the most effective treatment for each criterion measure at each grade level (see Table 1).

Table 1. Presentations Most Effective in Facilitating Immediate Retention on Each Critical Test for the High School Studies*

Critical Measures	Instructional Treatments			
	Ninth Grade	Tenth Grade	Eleventh Grade	Twelfth Grade
Drawing Test	II	II	II	I
Identification Test	II	II	II	V
Terminology Test	IV	III	I	IV
Comprehension Test	I	V	I	IV
Total Criterial Test	II	II	II	IV

Treatment I: Oral presentation
Treatment II: Simple line drawing presentation (b & w)
Treatment III: Simple line drawing presentation (color)
Treatment IV: Detailed, shaded drawing presentation (b & w)
Treatment V: Detailed, shaded drawing presentation (color)

*This table has been reprinted by permission from page 25, Francis M. Dwyer, A Guide for improving visual instruction. State College Penna.: Learning Service, 1972.

Of these 20 comparisons it will be noted that in four cases the simple oral presentation with no visuals was most effective. Treatment 2, the simple line drawing presentation was most effective in nine of the 20 comparisons. Treatment 3, the simple line drawing presentation in color was most effective in one comparison. Treatment 4 was most effective in four comparisons, while treatment 5 was most effective in two comparisons. It will be noted that the four realistic treatments i.e., 6 through 9 were not the most effective in any of the 20 comparisons.

In Dwyer's third study 261 college students were randomly assigned to the nine treatment groups. Students in each treatment group received identical oral treatment that was presented by tape recorder. Each treatment was presented in the same amount of time. Comparison of achievement on the five criterion measures indicated that the simple line drawing treatment in color was most effective for the total criterion test. For the four specific criterion measures the simple line drawing in black and white was most effective for the drawing test, the detailed shaded drawing for the identification test, and the oral presentation with no visuals for the terminology test and comprehensive test.

When we consider the overall results of Dwyer's three studies we find that the simple line drawing presentations emerged as the most effective on the total criterion measure. The four most complex treatments which consisted of black and white and color photographs of heart models and of actual hearts were the least effective.

These results seem to raise serious questions about the value of employing highly detailed, complex illustrations such as those that have been widely used in TEC lessons. However, the content to be learned in

the previous studies that we have discussed has differed considerably from the typical content included in TEC lessons. Also, much of the previous research has been carried out with school children rather than with adults. Therefore, it appeared that a carefully controlled study was needed which would employ an actual TEC lesson and would involve subjects from a typical TEC lesson target audience, in order to provide cost effectiveness data that could be weighed in future TEC lesson development.

Procedures

Sample

The target population for this research was Armor Crewmen (primary MOS 11e). A total of 80 subjects with this primary MOS were randomly assigned to four groups. Two of these groups, one morning and one afternoon, were administered the complex version of the selected TEC lesson while two other groups were administered the simple version.

Measures

The GT score, a composite army aptitude test score, was available on 79 of the 80 subjects. A 36 item pre-test was administered to all subjects prior to treatment. This pre-test dealt with the specific content covered in the selected TEC lesson, and consisted of 30 multiple choice items and 6 short answer items. The Coefficient of Internal Consistency of this measure (corrected with the Spearman-Brown Prophesy formula) was found to be .80.

Three post treatment measures were administered to the subjects. The first was a 36 item post test that closely paralleled the pre-test in terms of item content although the specific items employed in the two forms were different. This measure had a Coefficient of Internal Consistency of .81. The second post measure, called the Visual Achievement Test, consisted of seven items. Learners were given seven photographs of the coax machinegun,

the topic of the TEC lesson, and were asked questions which referred to these photographs, such as: "Using picture 38, write down the letter that points to the safety switch on the machine gun." This measure had a Coefficient of Internal Consistency of .57. This low reliability was probably due to the small number of items included. The third post treatment measure was a 17 item questionnaire. Six of the items on this questionnaire were designed to sample the attitudes and opinions of the subjects with regard to their general evaluation of the lesson. A composite score on these items will be identified as the general attitude score. The questionnaire also contained eight items which were concerned with specific aspects of the visuals employed in the lessons. Three items on the attitude scale could not be incorporated into the two aforementioned composite scores and were analyzed separately.* Sample copies of the measure developed for this study may be found in Appendix I.

The Treatments

The treatments that were employed in this experiment consisted of two forms of TEC lesson 020-171-5352-F entitled, Bore Sighting the Machineguns, M60/M60A1 Tank. The complex version of this lesson was the original lesson which is currently in operational use. It consists of an audio tape cassette plus 113 visuals connected in a filmstrip. These visuals include nine classified as simple artwork, 34 classified as standard artwork and 70 classified as complex artwork. For definitions of simple, standard and complex art used in classifying these visuals, see Appendix II. In order to develop a simpler version of this lesson, the investigators analyzed each frame in the complex lesson and prepared specifications for simplifying most of the frames. This process resulted in 38 simple frames,

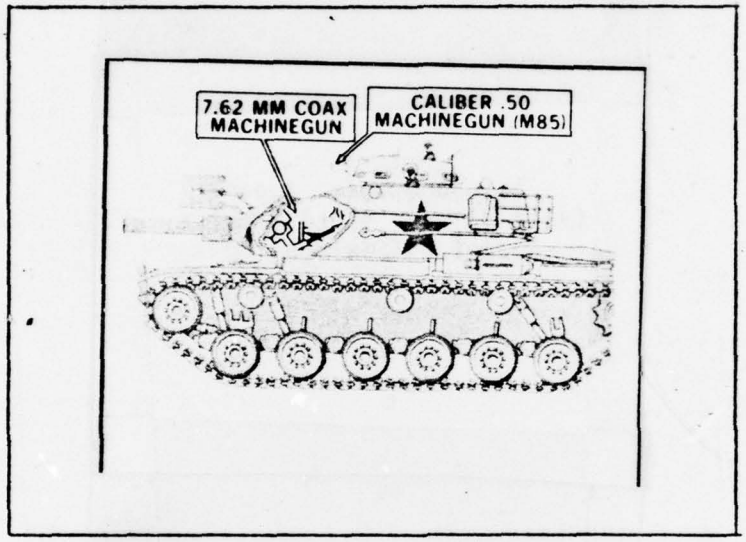
*The attitude and achievement measures for this study were developed, field tested, and revised by Glenda Gower & Richard Biege before their use in this research.

Figure 1

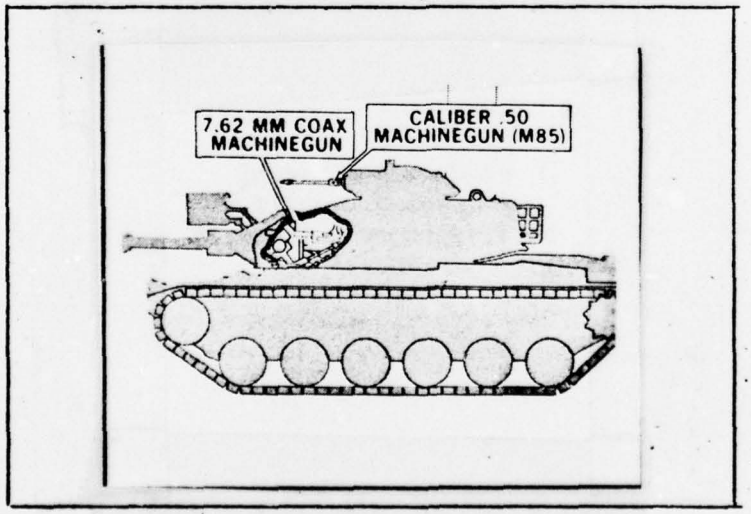
Comparison of Parallel Visuals

taken from the Complex and Simple Lessons

Complex



Simple



59 standard frames and 16 complex frames.

Since the purpose of the study was to compare two lessons that differed only in degree of complexity, the investigators avoided all changes in the slides that would improve the slide rather than merely simplify it. For many of the slides, changes could have been made, that would probably have improved effectiveness. Much of the simplification involved removing superfluous items such as folage in the foreground and mountains, trees, etc. in the background, removing hands from the equipment, removing uniform details from soldiers in the frames and sketching equipment rather than drawing it to scale. Figure 1 shows the simple and complex versions of one of the frames included in this lesson. Although the two versions of the lesson are far less different than the extremes of Dwyer's eight audiovisual treatments, they still represent a significant difference in production costs. The cost of the final artwork for the original lesson was $6,661 as compared to costs of $3,949 for the simplified lesson. This is a savings of $2,712 or about 40 percent on final artwork alone. Since the simple lesson was developed from the complex lesson, comparisons of the total cost of the two lessons cannot be made. However, a careful review of the itemized invoice for the complex lesson reveals several areas where savings would be made in developing a lesson with simpler art work. Both lessons employed the same audiotape and required the same time to complete, about 45 minutes.

Each treatment was carried out with two groups of 20 subjects. One group in each treatment was given the lesson in the morning and the other in the afternoon. This permitted the investigators to check the effects of time-of-day in addition to the effects of the two treatments.

Results

Analysis of covariance was employed to analyze the results of this study. The GT score and pre-test score were employed as covariates while the post test score, visual score, and the two attitude scores were employed as the dependent variables. None of the adjusted F tests for treatment, time of day, or treatment and time interaction were statistically significant (See Table 2). The F ratios were all very small, ranging from .08 to 2.9. An F ratio of 3.97 would have been needed to reach statistical significance at the .05 level. The largest F ratio of 2.9 was found between the morning versus afternoon scores on the visual test. It will be noted in Table 2 that the students in both the simple and complex treatments who took the visual test in the afternoon obtained slightly higher mean scores. For all four of the dependent variables the differences between the adjusted final mean scores for subjects in the simple versus complex treatments were extremely small (Table 2). Correlations between the covariates and dependent variables are given in Appendix III.

In addition to the analyses of covariance on the two attitude scores, a Chi-Square analysis was made for sixteen items on the attitude questionnaire, comparing the response patterns of subjects in the simple and complex treatments.* Only Item 10, "Did you find any mistakes on the pictures or sound?", showed a significantly different pattern of responses for the two treatment groups. Subjects in the simple lesson treatment gave more favorable responses than subjects in the complex lesson treatment. The Chi Square values for an additional five items approached significance, while response patterns for the remaining items were similar for the two treatment (See Table 3).

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*Item 16 was a free response item and could not be analysed using Chi Square.

Table 2

Analysis of Covariance Summary

Source Variation	DF	Post-Score MS	Post-Score F	Visual Score MS	Visual Score F	Gen. Att. Score MS	Gen. Att. Score F	Art Att. Score MS	Art Att. Score F
Total	78	131.60		13.53		12.44		14.02	
Method (Simple vs complex)	1	14.17	.198	.927	.0817	14.688	1.143	20.615	1.488
Time (AM vs. PM)	1	67.25	.941	33.076	2.916	.634	.0493	16.882	1.219
Method * Time	1	50.69	.709	8.560	.755	1.423	.111	5.207	.376
Covariates	2	2512.4	35.146	88.947	7.842	6.397	.498	18.01	1.300
GTS	1	127.72	1.787	18.07	1.593	12.283	.956	.749	.0541
Pre-Score	1	3194.07	44.682	173.18	15.268	5.171	.402	31.937	2.306
Error	73	71.48		11.343		12.847		13.851	

Table of Unadjusted and Adjusted Means		Simple	Complex	Simple	Complex	Simple	Complex	Simple	Complex
		41.250	41.050	10.350	10.900	26.150	25.400	34.200	35.850
Time	AM	41.922	39.453	10.439	10.885	26.138	25.541	34.248	35.794
		41.750	42.420	12.450	11.579	26.650	25.526	35.700	36.211
	PM	42.179	42.942	12.417	11.535	26.591	25.452	35.704	36.215

Table 2 (Cont.)

Table of Covariate

Beta Estimates

B (GTS)	+.09744	-.036652	-.030219	-.0074638
B (Pre-Score)	+.87318	+.20332	+.035133	+.087313

Model: $Yijk = E_1 + M_i + T_j + MT_{ij} + b_1\ (GTS) + b_2\ (Pre\text{-}score) + l_{ijk}$

where $E = \mu - b_1\ (\overline{GST}) - b_2\ (\overline{Pre\text{-}score})$

$\overline{Y}_{ij.(Adj)} = Y_{ij(Unadj)} - b_1\ (\overline{GTS}_{ij.} - \overline{GTS}_{...}) - b_2\ (\overline{Pre\text{-}sc}_{ij.} - \overline{Pre\text{-}sc}_{...})$

Table 3

Differences in Response Patterns on Attitude Items Between Subjects Completing Simple and Complex Lessons

Item	Chi Square	Level of Significance	Notes
1. Do you feel the lesson did a good job in helping you learn?	4.50	NS	Favors simple treatment (5.99 needed for .05 alpha)
2. Did the pictures focus your attention on the guns and materials the lesson was talking about? (Check one)	.20	NS	
3. Were the pictures incomplete or too sketchy. In other words, do you feel the pictures should contain more detail so that you know what is being talked about?	6.76	NS	Favors complex treatment (9.49 needed for .05 alpha)
4. Do you feel the pictures had too much detail?	2.26	NS	
5. How does this lesson compare to a Field Manual?	.54	NS	
6. If there were more lessons like this on other subjects, would you like to take them?	5.56	NS	Favors simple treatment (7.81 needed for .05 alpha)
7. Some pictures draw human figures in great detail, showing insignia, correct colors and physical details such as fingernails, etc. Which one of the following best describes the lesson you have just completed?	1.82	NS	
8. Do you think the amount of details in the pictures had any effect on how much you learned? (Check one)	2.46	NS	
9. The picture showing the unity power window of the commanders periscope in this lesson was not drawn in detail. Do you believe that drawing equipment with more detail would help you learn better? (Check one)	1.19	NS	

Table 3 (cont.)

Item	Chi Square	Level of Significance	Notes
10. Did you find any mistakes on the pictures or sound?	5.0	.05	Favors simple treatment
11. Did you have any problem understanding which parts of the machineguns the pictures were referring to?	4.44	NS	Favors complex treatment (5.99 needed for .05 alpha)
12. How well did the pictures represent parts of the machinegun?	5.03	NS	Favors complex treatment (5.99 needed for .05 alpha)
13. In your opinion, how well did this lesson teach you the lesson objectives?	.17	NS	
14. Have you ever seen an Army training film? If yes, how would you compare this lesson to a typical Army Training film?	.11	NS	
15. What did you like least about this lesson?	.99	NS	
16. How would you improve the lesson you just received?			Free response item.
17. What did you like best about this lesson?	4.41	NS	

*NS indicates "not significant". For Chi Square values that approach significance, alpha level needed to reach .05 level of significance is given.

For all of the attitude items, the responses of both treatment groups were strongly favorable (see Appendix IV). This suggests that the TEC lesson format is perceived very positively by the great majority of subjects in the target group.

Conclusions and Recommendations

The results of this study suggest that the use of a large percentage of complex art in the TEC lesson visuals contributes nothing to either the learning of soldiers in the target audience or to their attitudes concerning TEC lessons in general or the lesson they have just completed in particular. Although the results of this study apply more directly to some TEC lessons than others, when these results are considered along with other research in which a variety of different types of instructional material has been employed, it seems doubtful that the complex lesson format would be superior for any content that is likely to be covered in TEC lessons. In fact, Dwyer's work (1972) would suggest that if the investigators in this study had taken a more extreme approach and produced a greatly simplified set of TEC lesson visuals, the results might actually have favored the very simple version as opposed to the complex version currently in use.

In view of the results of this research, the following recommendations appear to be justified:

1. In the development of future TEC lessons as high a percentage of simple art as possible should be employed. Contractors should be allowed to use standard and complex art only when they can provide a strong justification that is approved by the US Army Training Support Center.
2. Additional research should be carried out in which lessons using very simple artwork are compared with the complex art currently being used in TEC lessons that are in the field. The simple art versions in this research should go as far towards simplification as the US Army Training Support

Center and the cooperating Technical Schools are willing to accept. It would probably be desirable to classify current TEC lessons into several categories depending on the nature of their content and the objectives that the learner is to achieve. If one current TEC lesson were randomly selected from each of the lesson categories and an extremely simple version of the visuals was produced, a series of studies could be conducted that would provide conclusive evidence on the types of lessons in which simple art is equal or superior to complex art. If this proposed program of research yielded results for different types of TEC lessons similar to that which Dwyer obtained in his research, the application of these findings could bring about a very substantial saving in the development of future TEC lessons accompanied by an increase in lesson effectiveness.

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Appendix I

Sample Copies of Measures Used*

(Include 1 copy each of: Form A (pretest), Form B (post test), and To the Soldier (attitude test).

*Photographs used in the Visual Achievement Test are not included.

Appendix II

Contractual Definitions of Simple, Standard and Complex Art

Simple - Original artwork which requires a minimum effort and creativity and that art which is accomplished by utilizing a basic singular approach, shape and/or technique. This would include line drawings which do not require exact detail, complexity or absolute accuracy, also paste-ups of reproductions of existing graphics and/or photographs (with minimum retouching) silhouettes and call-outs. Letters, words, numbers and/or groups of numbers shall be considered simple art. Generally when any combination totaling nine or less appear in a straight-forward manner. Overlays will be evaluated on their own merit using this same criteria.

If an overlay is used as an integral part of the original art to make it complete (not to modify that piece of art, so that it may appear in a different portion of the lesson) then there shall be no seperate charge for the overlay.

If the overlay is used to modify an existing piece of art so that it may be used elsewhere in the same program then the overlay will be classified separately.

Standard - Original art which would reflect a certain degree of effort and creativity in order to achieve a detailed, uncomplicated rendering of a concept or an object.

This would include but not be limited to line schematic drawings, graphs, flow charts, moderately executed cartoons of human figures or equipment. If lettering, words or groups of numbers are presented under this criteria, they shall be classified standard, otherwise ten or more letters, words, numbers and/or groups of numbers presented in a straight

forward manner will constitute standard art.

If an overlay is used as an integral part of the original art to make it complete (not to modify that piece of art, so that it may appear in a different portion of the lesson) then there shall be no seperate charge for the overlay.

If the overlay is used to modify an existing piece of art so that it may be used elsewhere in the same program then the overlay will be classified seperately.

Complex - Original artwork in exact detail which would reflect a great degree of planning, and effort derived from highly detailed, realistic or stylized complex subject matter.

This would include art depicting extremely detailed equipment, complex equipment and components, realistic human figures and highly detailed cartoon formats.

If an overlay is used as an integral part of the original art to make it complete (not to modify that piece of art, so that it may appear in a different portion of the lesson) then there shall be no separate charge for the overlay.

If the overlay is used to modify an existing piece of art so that it may be used elsewhere in the same program then the overlay will be classified seperately.

Appendix III

Correlations between Covariates and Dependent Variables

	1	2	3	4	5	6
GT Score		.47	.40	.04	-.10	.07
Pre Ach. Test			.68	.39	.02	.19
Post Ach. Test				.45	.08	.21
Visual Ach. Test					-.06	-.04
General Attitude Score						.39
Art Attitude Score						

Appendix IV

Responses to Attitude Items by Subjects in Simple and Complex Treatments

1. Do you feel the lesson did a good job in helping you learn? (Check one)

Simple	Complex		
34	25	a.	Yes
6	14	b.	A little
0	0	c.	Can't tell
0	1	d.	Probably not
0	0	e.	No

2. Did the pictures focus your attention on the guns and materials the lesson was talking about? (Check one)

35	35	a.	Yes
5	4	b.	A little
0	0	c.	Can't tell
0	1	d.	Probably not
0	0	e.	No

3. Were the pictures incomplete or too sketchy. In other words, do you feel the pictures should contain more detail so that you know what is being talked about? (Check one)

10	2	a.	Yes
7	10	b.	A little
2	2	c.	Can't tell
6	7	d.	Probably not
14	19	e.	No

4. Do you feel the pictures had too much detail? (Check one)

0	1	a.	Yes
2	1	b.	A little
2	0	c.	Can't tell
1	2	d.	Probably not
35	36	e.	No.

5. How does this lesson compare to a Field Manual? (Check one)

24	22	a.	Much more effective than a Field Manual.
9	11	b.	A little more effective than a Field Manual.
4	3	c.	About equal to a Field Manual.
1	2	d.	A little less effective than a Field Manual.
3	1	e.	Much less effective than a Field Manual.

6. If there were more lessons like this on other subjects, would you like to take them? (Check one)

29	19	a.	Definitely yes
9	13	b.	Probably
1	2	c.	Can't tell
0	3	d.	Probably not
1	2	e.	Definitely no

7. Some pictures draw human figures in great detail, showing insignia, correct colors and physical details such as fingernails, etc. Which one of the following best describes the lesson you have just completed? (Check one)

19	21	a.	Nearly all details were shown.
12	11	b.	Some details were shown.
1	3	c.	Could not tell about details.
7	3	d.	Some details were omitted.
1	2	e.	Most details were omitted.

8. Do you think the amount of details in the pictures had any effect on how much you learned? (Check one)

22	21	a.	Very much effected my learning.
10	12	b.	Some effect on my learning.
2	2	c.	Little effect on my learning.
5	2	d.	Very little effect on my learning.
1	3	e.	No effect on my learning.
0	0	f.	Interferred with my learning because they drew my attention away from what was being said.

9. The pictures showing the unity power window of the commanders periscope in this lesson was (complex version) was not (simple version) drawn in detail. Do you believe that drawing equipment with more details would help you learn better? (Check one)

2	1	a.	Much harder to learn with details because too many details are distracting.
6	8	b.	A little harder to learn with details because too many details are distracting.
3	6	c.	No difference in learning with details.
17	18	d.	Some details help my learning.
11	8	e.	Details greatly help my learning.

10. Did you find any mistakes on the pictures or sound? (Check one)

1/7 Yes 39/33 No

If yes, what mistakes did you find?

_____

_____

11. Did you have any problem understanding which parts of the machineguns the pictures were referring to? (Check one)

31	37	a.	No problem
6	3	b.	A little problem
3	0	c.	Some problems, but I finally figures it out.
0	0	d.	A lot of problems, I did not understand it.
0	0	e.	It was totally hopeless.

12. How well did the pictures represent parts of the machinegun? (Check one)

30	31	a.	Pictures look very much like the actual guns.
5	9	b.	Pictures look a little like the actual guns.
1	0	c.	I have never seen a machinegun.
4	0	d.	Pictures are a little different from the actual guns.
0	0	e.	Pictures are very different from the actual guns.

13. In your opinion, how well did this lesson teach you the lesson objectives? (Check one)

14	12	a.	Extremely well
16	16	b.	Above average
10	11	c.	Average -OK
0	0	d.	Below average
0	0	e.	Very poor

14. Have you ever seen an Army training film? (Check one)

36/39 Yes 4/1 No

If yes, how would you compare this lesson to a typical Army Training film? (Check one)

19	21	a.	Much better than a typical Army training film.
9	12	b.	A little better than a typical Army training film.
3	3	c.	Equal to a typical Army training film.
3	1	d.	A little worse than a typical Army training film.
1	1	e.	Much worse than a typical Army training film.

15. What did you like least about this lesson?

3	1	a.	It was difficult to understand what I was supposed to learn.
5	5	b.	It was difficult to relate the pictures to the actual tank.
8	8	c.	Too much information to remember everything.
7	7	d.	Too easy, no challenge in it.
11	9	e.	Other (explain) _____

_____

16. How would you improve the lesson you just received?

_____

_____

17. What did you like best about this lesson?

20	16	a.	The pictures made it easy to understand what was being taught.
5	4	b.	I didn't have to read the lesson.
4	1	c.	The sound helped me understand the material.
1	0	d.	The machine was simple to operate and enjoyable to use.
7	12	e.	It's easier to learn by using this machine than reading books.
3	0	f.	Other (explain)_____

_____

Pre-Test

FORM A

NAME (PLEASE PRINT) _____

1. When aligning the coax machinegun and main gun on the same target, which of the following statements is correct?

_____ a. The machinegun target aiming point is slightly higher than the main gun aiming point.

_____ b. The machinegun and main gun have the same target aiming point.

_____ c. The machinegun target aiming point is slightly lower than the main gun aiming point.

_____ d. There is no relationship between the machinegun and main gun aiming point.

2. Check those steps which must be done before you can remove the receiver assembly.

_____ a. Pull right disconnector ring to the rear.

_____ b. Unsnap cover shield.

_____ c. Loosen gun mount collar.

_____ d. Remove super elevation from computer.

_____ e. Disconnect electrical lead wire.

_____ f. Remove left disconnector ring.

_____ g. Barrel extension assembly in forward position.

_____ h. Remove barrel assembly.

3. Setscrews can be found in the collar of the gun mount cover shield in:

_____ a. M60 Tank

_____ b. M48

_____ c. M48A1

_____ d. M60A1 Tank

_____ e. All of the above

4. Adjustments must be made to setscrews in the collar of the gun mount cover shield when making adjustments during boresighting. The setscrews should be:

_____ a. Removed completely from the collar until gun is boresighted.

_____ b. Loosened three complete turns prior to boresighting.

_____ c. Loosened one and a half turns prior to boresighting.

_____ d. Loosened after gun is boresighted.

5. What is a second way to align the main gun if you've already removed the boresight cross from the gun tube?

_____ a. Use gunner's periscope and align daylight reticle on aiming point.

_____ b. Adjust slip scales to the reading they were first set on.

_____ c. Adjust using elevation and deflection knobs.

_____ d. Adjust using elevation handle and turning the turret.

_____ e. None of the above.

6. What is the main purpose of using binoculars in boresighting the machinegun?

_____ a. To enlarge targets to find right angle aiming points.

_____ b. As an aid to boresight accurately.

_____ c. To identify long range targets.

_____ d. To insure all sightings are made with the same viewing perspective.

7. Why don't we use a boresight cross on the coax machinegun when aligning on a target?

_____ a. The barrel is too small to construct a boresight cross with accuracy.

_____ b. The bore of the machinegun is so small the boresight cross could cause damage to the machinegun by blocking escaping gases.

_____ c. Machineguns do not have to be accurately aligned on specific targets.

_____ d. You can't see through the bore of the coax machinegun.

8. The bracket assembly mounting screws must be loosened to:

_____ a. Adjust gun horizontally.

_____ b. Adjust gun vertically.

_____ c. Both of the above.

_____ d. None of the above.

9. The infinity sight body is located in which of the following locations:

_____ a. Between the bracket assembly mounting screws.

_____ b. Behind the gunner's periscope.

_____ c. On the right side of the main gun tube.

_____ d. On the right side of the receiver assembly.

10. What is the primary purpose of the unity power window?

_____ a. To check and see that the main gun and machinegun are on the same target.

_____ b. To sight for moving vehicles.

_____ c. To fire at area targets.

_____ d. Align machinegun on right angle targets.

11. How do you align the infinity sight reticle on the target aiming point?

_____ a. By adjusting the slip scales.

_____ b. By adjusting the elevation and deflection knobs.

_____ c. By adjusting the horizontal and vertical setscrews.

_____ d. None of the above.

12. When retightening the support setscrews in the collar of the gun mount after boresighting the tank gun, the setscrews are tightened until they touch the flash suppressor body and then:

_____ a. Backed off one turn.

_____ b. Backed off one-fourth to one-half turn.

_____ c. Left tight against the flash suppressor.

_____ d. Backed off two full turns.

13. What is the primary objective in the procedures for boresighting the M-85 machinegun?

_____

_____

_____

14. Three items must be opened to expose the M85 gun parts to be removed during boresighting. Check the correct items.

_____ a. Machinegun cover assembly.

_____ b. Ammunition belt removed.

_____ c. Cradle doors.

_____ d. Access doors.

_____ e. Bolt assembly.

_____ f. Manual firing trigger extension handle.

_____ g. Bolt buffer group

15. In boresighting in M85 machinegun, which of the following is correct:

_____ a. The safety switch is in the "FIRE" position when moving the bolt assembly to the forward position and in the "SAFE" position during all other boresighting procedures.

_____ b. The safety switch is in the "FIRE" position for all boresighting procedures.

_____ c. The safety switch is never taken out of the "SAFE" position even when moving the bolt assembly forward.

_____ d. The safety switch is in the "SAFE" position when moving the bolt assembly to the forward position and in the "FIRE" position during all other boresighting procedures.

16. Why must the ammunition belt be removed from the M85 machinegun prior to boresighting?

_____ a. To prevent possible misfiring of the gun.

_____ b. To allow access to the bolt assembly.

_____ c. To see through the bore of the gun.

_____ d. To clear the cover assembly.

_____ e. All of the above.

17. List the five main steps which must be taken to move the M85 bolt assembly to the full forward position?

a. _____

b. _____

c. _____

d. _____

e. _____

18. Before you can see through the M85 barrel, four parts from the machinegun must be removed. Number the correct parts in the order they must be removed, 1, 2, 3, 4.

_____ a. Receiver assembly

_____ b. Ammunition belt

_____ c. Bolt assembly

_____ d. Back plate assembly

_____ e. Hand charger assembly

_____ f. Sear assembly

_____ g. Bolt buffer group

_____ h. Solenoid lead connector assembly

19. What must be done to the driving spring guide rod to remove it from the bolt buffer group?

_____ a. Turn guide rod 1/8 turn counterclockwise (left) and pull back.

_____ b. Turn guide rod 1/4 turn clockwise (right) and pull back.

_____ c. Turn guide rod 1/4 turn counterclockwise (left) and push forward.

_____ d. Turn guide rod 1/8 turn clockwise (right) and push forward.

20. Which of the following is true when removing the sear assembly from the M85?

_____ a. Safety switch must be in FIRE position during removal and put in SAFE position after removal.

_____ b. Safety switch must be in FIRE position during entire boresighting procedure.

_____ c. Safety switch must remain in SAFE position during all boresighting procedures.

_____ d. Safety switch must be in SAFE position during removal of the sear assembly and then put in FIRE position after removal.

21. Why must you hold one hand over the back of the receiver group when jerking on the charger handle during boresighting procedures for the M85?

_____ a. To push the bolt assembly forward.

_____ b. To stabilize pulling on the charger handle.

_____ c. To prevent the bolt assembly from flying out.

_____ d. To hold the safety switch in the correct position.

_____ e. None of the above.

22. The feed actuator switch of the M85 prevents looking through the bore of the machinegun. To look through the bore you must:

_____ a. Hold feed actuator lever to right.

_____ b. Remove feed actuator lever.

_____ c. Push feed actuator to rear.

_____ d. Hold feed actuator lever to the left.

23. What is the ideal distance of a target for use in boresighting the M85 machinegun?

_____ a. 300 meters

_____ b. 400 meters

_____ c. 100 meters

_____ d. 500 meters

24. If you sight through the M85 gun bore and see that the bore is low and left of the target aiming point, what adjustments must you make to center the bore on the target?

_____ a. Lower gun with elevating handle and traverse (turn) cupola to the right.

_____ b. Lower gun with elevating handle and traverse (turn) cupola to the left.

_____ c. Raise gun with elevating handle and traverse (turn) cupola to the right.

_____ d. Raise gun with elevating handle and traverse (turn) cupola to the left.

25. In boresighting the commander's periscope after the machinegun is boresighted, which of the following statements is true?

_____ a. The machinegun may be moved but the cupola may not.

_____ b. Neither the machinegun or the cupola can be moved.

_____ c. Both the machinegun and cupola can be moved as necessary without losing your machinegun boresight.

_____ d. The cupola may be moved but the machinegun cannot.

26. In boresighting the commander's periscope, what is your objective?

_____ a. To insure that the boresight cross is aligned on the target aiming point.

_____ b. To insure that the boresight cross is parallel to the target aiming point and slightly to the left.

_____ c. To insure that the boresight cross is parallel to the target aiming point and slightly to the right.

_____ d. There is no direct relationship between the boresight cross and target aiming point.

27. What number must you set the slip scales on when boresighting the commander's periscope?

_____ a. The closest even number.

_____ b. Four

_____ c. Zero

_____ d. The closest odd number.

28. What is the difference in the procedures used to boresight the I-R elbow when it is daylight and at dusk?

_____

_____

_____

29. Why must the solenoid lead wire be disconnected from the receiver assembly during boresighting?

_____ a. To prevent electrical firing of the gun.

_____ b. To allow room to remove the receiver assembly.

_____ c. So that the safety switch can be manipulated.

_____ d. All of the above.

30. Which of the following targets would be best for use in boresighting the coax machinegun?

_____ a. House at a range of 1200 meters.

_____ b. Personnel carrier at range of 700 meters.

_____ c. House at a range of 500 meters.

_____ d. Personnel carrier at range of 100 meters.

31. Before you can see through the coax machinegun, which of the following parts must be removed?

_____ a. Sear assembly

_____ b. Barrel jacket assembly

_____ c. Feed and ejector assembly

_____ d. Accelerator assembly

_____ e. Receiver assembly

32. Which of the following best describes the characteristics of "right angles" in a proposed target?

_____ a. Target should be at right angle to the tank to allow for a direct hit.

_____ b. Target should be constructed with right angles on it for alignment.

_____ c. The cross strings on the main gun should be at right angles to each other before aligning with the target.

_____ d. When attaching cross hairs to the coax, be sure they are at right angles for alignment with target.

33. Suppose horizontal adjustments are necessary in boresighting the coax. All necessary parts have been removed. What are the main steps necessary to adjust the gun to align it on the target horizontally.

_____

_____

_____

34. Your main gun has been boresighted, but is no longer laid on the boresighting target. You are now ready to boresight the coax machinegun. You have removed superelevation from the system, removed the receiver assembly and loosened the setscrews in the collar of the gun mount cover shield. What else must you do before you can make any adjustments of the coax machinegun?

_____ a. Sight through the commander's periscope.

_____ b. Align the main gun on the target aiming point.

_____ c. Put bolt assembly in full forward position.

_____ d. Loosen horizontal and vertical mounting screws and setscrews.

_____ e. None of the above.

35. Assume you have already removed all the necessary parts to boresight the coax. When sighting through the bore you decide that it is necessary to adjust the gun vertically. List the main steps necessary to adjust the gun vertically.

_____

_____

_____

36. At 1300 hours, the ballistic computer has been set at 00, the main gun boresighted and associated periscope and telescope aligned on the target aiming point using both reticles. Power is restored to the computer and tank system. The coax gun is boresighted on the target aiming point. And the infinity sight reticle on the unity power window is adjusted. At 1800 hours, the tank is moved 30 meters forward. At 2300 hours, rounds are fired from both the main gun and the coax but they do not hit in the same neighborhood. Select the answer which best describes why.

_____ a. The coax cannot be used for night firing.

_____ b. Moving the tank forward 30 meters altered the sighting.

_____ c. Coax not boresighted with 00 reading of super-elevation.

_____ d. You must boresight at night for night firing.

FORM B

NAME (Please Print): _____

1. Which of the following statements is correct?

____a. Machineguns and main guns have the same target aiming point.

____b. Machinegun target aiming point is lower than the main gun aiming point.

____c. Machinegun target aiming point is higher than the main gun aiming point.

____d. There is no relationship between the two targets.

2. Identify what must be done before you can remove the receiver assembly by checking the appropriate letters.

____a. Barrel extension assembly in forward position.

____b. Unsnap cover shield.

____c. Remove super elevation from computer.

____d. Loosen gun mount collar.

____e. Remove left disconnector ring.

____f. Remove barrel assembly.

____g. Disconnect electrical lead wire.

____h. Pull right disconnector ring to the rear.

3. The collar of the gun mount cover shield contains set-screws in the:

____a. M60A1 tank

____b. M48 tank

____c. M60 tank

____d. M48A1 tank

____e. All of the above.

4. What must be done to the setscrews in the collar of the gun mount cover shield for boresighting purposes?

____a. Remove from the collar until after gun is boresighted, then replace them.

____b. Loosened after gun is boresighted.

____c. Loosened three complete turns prior to boresighting.

____d. Loosened one and a half turns prior to boresighting.

5. If the boresight cross has already been removed from the main gun tube, what else can be done to aline the main gun?

____a. Adjust using elevation and deflection knobs.

____b. Use gunner's periscope and aline daylight reticle on aiming point.

____c. Adjust slip scales to the reading they were first set on.

____e. None of the above.

6. Binoculars are used in boresighting the machinegun because:

____a. It is necessary to make the targets look bigger to find right angles for aiming.

____b. We need to insure that all sightings have the same perspective.

____c. Long range targets need to be identified.

____d. They allow for more accuracy in boresighting.

7. A boresighting cross is not used on the coax machinegun because:

____a. Machineguns aren't made to be that accurate.

____b. You can't see through the bore.

____c. The barrel is too small to use one accurately.

____d. It could damage the gun by blocking in gases.

8. Why are the bracket assembly mounting screws loosned?

____a. To make vertical adjustments to the gun.

____b. To make horizontal adjustments to the gun.

____c. To make both vertical and horizontal adjustments to the gun.

____d. None of the above.

9. Where is the infinity sight body located?

____a. Right of the main gun tube.

____b. Between bracket assembly mounting screws.

____c. In back of the gunner's periscope.

____d. Right of the receiver assembly.

10. What is the unity power window used for?

____a. To aline machinegun on right angle targets.

____b. To fire at "area targets" like troops.

____c. To sight moving vehicles.

____d. To check and see that main gun and machineguns are on the same target.

11. How is the infinity sight reticle alined?

____a. Using elevation and deflection knobs.

____b. By setting the slip scales.

____c. By adjusting the horizontal and vertical setscrews.

____d. None of the above.

12. After boresighting, what must be done to the setscrews in the collar of the gun mount cover shield?

____a. Tightened until they touch the flash suppressor.

____b. Backed off two full turns from the flash suppressor body.

____c. Backed off one turn from the flash suppressor body.

____d. Backed off 1/4 to 1/2 turn from the flash suppressor body.

13. The primary objective in the process for boresighting the M-85 machinegun is:_____

_____

_____

_____

14. In order to expose the M-85 gun parts which are to be removed during boresighting, three items must be opened. What are the items?

____a. Manual firing trigger extension handle.

____b. Bolt assembly.

____c. Bolt buffer group.

____d. Cradle doors.

____e. Machinegun cover assembly.

____f. Ammunition belt removed.

____g. Access doors.

15. Which of the following statements correctly describes the position of the "Fire/Safety" switch when boresighting the M-85 machinegun?

____a. The switch is in the "Safe" position for all boresighting procedures.

____b. The switch is in the "Fire" position for all boresighting procedures.

____c. The switch is in the "Safe" position when moving the bolt assembly to the forward position and in "Fire" position during other boresighting procedures.

____d. The switch is in "Fire" position to move bolt assembly forward and in "Safe" position for other boresighting procedures.

16. Prior to boresighting the M-85 machinegun, why must the ammunition belt be removed?

____a. To prevent possible misfiring of the gun.

____b. To clear the cover assembly.

____c. To see through the bore of the gun.

____d. To allow access to the bolt assembly.

____e. All of the above.

17. In order to move the M-85 bolt assembly to the full forward position, what five main steps must be taken?

a._____

b._____

c._____

d._____

e._____

18. Number in order of removal the four parts which must be removed before you can see through the barrel of the M-85 machinegun.

____a. Back plate assembly.

____b. Hand charger assembly.

____c. Sear assembly.

____d. Bolt assembly.

____e. Receiver assembly.

____f. Bolt buffer group.

____g. Ammunition belt.

____h. Solenoid lead connector assembly.

19. In order to remove the driving spring guide rod from the bolt buffer group, what must be done?

____a. Turn guide rod 1/4 turn counter-clockwise (left) and push forward.

____b. Turn guide rod 1/8 turn counter-clockwise (left) and pull back.

____c. Turn guide rod 1/8 turn clockwise (right) and push forward.

____d. Turn guide rod 1/4 turn clockwise (right) and pull back

20. What should be the position of the "Fire/Safety" switch when removing the sear assembly from the M-85?

____a. Switch must be in "Safe" position for all boresighting procedures.

____b. Switch must be in "Fire" position for all boresighting procedures.

____c. Switch must be in "Fire" position during removal and "Safe" after removal.

____d. Switch must be in "Safe" position during removal and "Fire" after removal.

21. You should hold one hand over the back of the receiver assembly when jerking on the charger handle during boresighting. Why?

____a. To stabilize pulling on the charger handle.

____b. To prevent the bolt assembly from flying out.

____c. To hold the bolt assembly forward.

____d. To keep the safety switch in the correct position.

____e. None of the above.

22. In order to look through the bore of the M-85, what must you do with the feed actuator switch?

____a. Hold lever to the rear.

____b. Remove the lever.

____c. Hold lever to the left.

____d. Hold lever to the right.

23. Ideally, how far away should the target be when boresighting the M-85?

____a. 1200 meters

____b. 100 meters

____c. 500 meters

____d. 300 meters

____e. 400 meters

24. You look through the bore of the M-85 and see that the bore is low and left of the target. What must you do to center the bore on the target?

____a. Raise gun with elevating handle and traverse (turn) cupola to the left.

____b. Lower gun with elevating handle and traverse (turn) cupola to the left.

____c. Lower gun with elevating handle and traverse (turn) cupola to the right.

____d. Raise gun with elevating handle and traverse (turn) cupola to the right.

25. The machinegun has been boresighted. You are now boresighting the commander's periscope. Which statement is true?

____a. You can't move the machinegun or cupola.

____b. You can move the cupola but not the machinegun.

____c. You can move the machinegun but not the cupola.

____d. Both the machinegun and cupola can be moved.

26. Why do you boresight the commander's periscope?

____a. So that the boresight cross is parallel to the target aiming point and slightly left.

____b. So that the boresight cross is parallel to the target aiming point and slightly right.

____c. So that the boresight cross is on the target aiming point.

____d. There is no reason to boresight the commander's periscope.

27. The slip scales on the commander's periscope should be set on what number?

____a. Zero

____b. Four

____c. Closest even number.

____d. Closest odd number.

28. What must be done to boresight the I-R elbow at dusk? In daylight?_____

_____

_____

_____

29. The solenoid lead wire must be disconnected from the receiver assembly during boresighting. Why?

____a. So that the safety switch can be manipulated.

____b. To prevent electrical firing of the gun.

____c. To allow room to remove the receiver assembly.

____d. All of the above.

30. In order to boresight the coax, which target would you select?

____a. Personnel carrier at 100 meter range.

____b. House at 500 meter range.

____c. Personnel carrier at 700 meter range.

____d. House at 1200 meter range.

31. Which part(s) must be removed from the coax so that you can see through the bore?

____a. Barrel jacket assembly.

____b. Receiver assembly.

____c. Sear assembly.

____d. Accelerator assembly.

____e. Feed and ejector assembly.

32. A characteristic of a good target is "right angles." What does this mean?

____a. When attaching cross hairs to the coax, they should be at right angles for alignment on the target.

____b. Target should be at a right angle to the tank to allow for a direct hit.

____c. Target should be made with right angles on it for alignment.

____d. The cross strings on the main gun should be at right angles to each other before aligning with the target.

33. All necessary parts have been removed from the coax and you see that the gun needs to be adjusted horizontally. What are the main steps to do?_____

_____

_____

_____

_____

34. You are going to boresight the coax machinegun. The main gun has been boresighted, but is no longer centered on the target. You have removed the super elevation from the system, removed the receiver assembly and loosened the set-screws in the collar of the gun mount cover shield. What must be done before you can make any adjustments to the coax?

____a. Put bolt assembly in full forward position.

____b. Aline the main gun on the target aiming point.

____c. Sight through the commander's periscope.

____d. Loosen horizontal and vertical mounting screws and setscrews.

____e. None of the above.

35. All necessary parts have been removed to boresight the coax. You need to adjust the gun vertically. What are the main steps to make a vertical adjustment?_____

_____

_____

36. The ballistic computer was set a 00 at 1300 hours and the main gun boresighted as well as the periscope and telescope, using both reticles. Power was later restored to the tank system and computer. The coax gun is then boresighted on the same target aiming point, The infinity sight reticle on the unit power window is adjusted. The tank is backed up 50 meters at 1800 hours. Later, at 2300 hours, you fire both the coax and the main gun but they don't hit the same target. Why?

____a. Moving the tank back 50 meters altered the sighting.

____b. The coax cannot be used for night firing.

____c. Coax not boresighted with a 00 reading in the computer.

____d. To fire at night, you must boresight in the night or at dusk.

NOTE: The following questions use pictures in the black notebook you have been given.

37. Using picture # 37 , which statement best describes the condition of the gun in that picture?

_____ a. Safety switch in "SAFE" position, bolt forward.

_____ b. Safety switch in "FIRE" position, bolt forward.

_____ c. Safety switch in "SAFE" position, bolt to the rear.

_____ d. Safety switch in "FIRE" position, bolt to the rear.

38. Using picture # 38 , write down the letter which points to the safety switch on the machinegun.

_____ M

_____ N

_____ O

_____ P

39. Using picture # 39/40, check the letters which point to the mounting screws and setscrews used to make horizontal (across) adjustments on the coax machinegun.

_____ R

_____ S

_____ T

_____ U

_____ V

_____ W

_____ X

_____ Y

_____ Z

40. Using the same picture, picture #39/40, check the letters which point to the mounting screws and setscrews used to make <u>vertical</u> (up and down) adjustments on the coax machinegun.

_____ R

_____ S

_____ T

_____ U

_____ V

_____ W

_____ X

_____ Y

_____ Z

41. Using picture #41, check the letter which points to the part used to remove superelevation from the ballistic computer.

_____ D

_____ E

_____ F

_____ G

_____ H

42. Using picture #42, check the letter which points to the unity power windown, if it is shown.

_____ A

_____ B

_____ C

_____ D Not shown

43. Using the seven pictures for #43, match the names of parts with the correct picture.

_____ Backplate assembly

_____ Sear assembly

_____ Bolt assembly

_____ Bolt buffer group

TO THE SOLDIER

You have just taken training using a TEC lessons. Please fill in this questionnaire concerning the lesson you used.

NAME:

SSN:

1. Do you feel the lesson did a good job in helping you learn? (Check one)

_____ a. Yes

_____ b. A little

_____ c. Can't tell

_____ d. Probably not

_____ e. No

2. Did the pictures focus your attention on the guns and materials the lesson was talking about? (Check one)

_____ a. Yes

_____ b. A little

_____ c. Can't tell

_____ d. Probably not

_____ e. No

3. Were the pictures incomplete or too sketchy. In other words, do you feel the pictures should contain more detail so that you know what is being talked about? (Check one)

_____ a. Yes

_____ b. A little

_____ c. Can't tell

_____ d. Probably no

_____ e. No

4. Do you feel the pictures had too much detail? (Check one)

_____ a. Yes

_____ b. A little

_____ c. Can't tell

_____ d. Probably no

_____ e. No

5. How does this lesson compare to a Field Manual? (Check one)

_____ a. Much more effective than a Field Manual.

_____ b. A little more effective than a Field Manual.

_____ c. About equal to a Field Manual.

_____ d. A little less effective than a Field Manual.

_____ e. Much less effective than a Field Manual.

6. If there were more lessons like this on other subjects, would you like to take them? (Check one)

_____ a. Definitely yes

_____ b. Probably

_____ c. Can't tell

_____ d. Probably not

_____ e. Definitely no

7. Some pictures draw human figures in great detail, showing insignia, correct colors and physical details such as fingernails, etc. Which one of the following best describes the lesson you have just completed. (Check one)

_____ a. Nearly all details were shown.

_____ b. Some details were shown.

_____ c. Could not tell about details.

_____ d. Some details were omitted.

_____ e. Most details were omitted.

8. Do you think the amount of details in the pictures had any effect on how much you learned? (Check one)

_____ a. Very much effected my learning.

_____ b. Some effect on my learning.

_____ c. Little effect on my learning.

_____ d. Very little effect on my learning.

_____ e. No effect on my learning.

_____ f. Interferred with my learning because they drew my attention away from what was being said.

9. The picture showing the unity power window of the commanders periscope in this lesson was drawn in detail. Do you believe that drawing equipment with a lot of details would help you learn better? (Check one)

_____ a. Much harder to learn with details because too many details are distracting.

_____ b. A little harder to learn with details because too many details are distracting.

_____ c. No difference in learning with details.

_____ d. Some details help my learning.

_____ e. Details greatly help my learning.

10. Did you find any mistakes on the pictures or sound? (Check one)

_____ Yes _____ No

If yes, what mistakes did you find?

_____

_____

11. Did you have any problem understanding which parts of the machineguns the pictures were referring to? (Check one)

_____ a. No problem

_____ b. A little problem

_____ c. Some problems, but I finally figured it out.

_____ d. A lot of problems, I did not understand it.

_____ e. It was totally hopeless.

12. How well did the pictures represent parts of the machinegun? (Check one)

_____ a. Pictures look very much like the actual guns.

_____ b. Pictures look a little like the actual guns.

_____ c. I have never seen a machinegun.

_____ d. Pictures are a little different from the actual guns.

_____ e. Pictures are very different from the actual guns

13. In your opinion, how well did this lesson teach you the lesson objectives? (Check one)

_____ a. Extremely well

_____ b. Above average

_____ c. Average -OK

_____ d. Below average

_____ e. Very poor

14. Have you ever seen an Army training film? (Check one)

_____ Yes _____ No

If yes, how would you compare this lesson to a typical Army Training film? (Check one)

_____ a. Much better than a typical Army training film.

_____ b. A little better than a typical Army training film.

_____ c. Equal to a typical Army training film.

_____ d. A little worse than a typical Army training film.

_____ e. Much worse than a typical Army training film.

15. What did you like least about this lesson?

_____ a. It was difficult to understand what I was supposed to learn.

_____ b. It was difficult to relate the pictures to the actual tank.

_____ c. Too much information to remember everything.

_____ d. Too easy, no challenge in it.

_____ e. Other (explain)

_____

_____

16. How would you improve the lesson you just received?

_____

_____

17. What did you like best about this lesson?

_____ a. The pictures made it easy to understand what was being taught.

_____ b. I didn't have to read the lesson.

_____ c. The sound helped me understand the material.

_____ d. The machine was simple to operate and enjoyable to use.

_____ e. It's easier to learn by using this machine than reading books.

_____ f. Other (explain)

_____

_____