A GUIDE FOR DETERMINING TRAINING AID AND DEVICE REQUIREMENTS

Human Engineering Report SDC 383-04-1

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Too often the determination of requirements for training devices are the result of "instructor-inventions", or guesses that a training device is needed. This report outlines a simple and effective method for determining training aid and device requirements at a military installation.

By using the method described in this report the device requirements indicated by the specific problems in a training program can be determined. This technique will also increase the effectiveness of the required devices since they will be "tailor made".[1]

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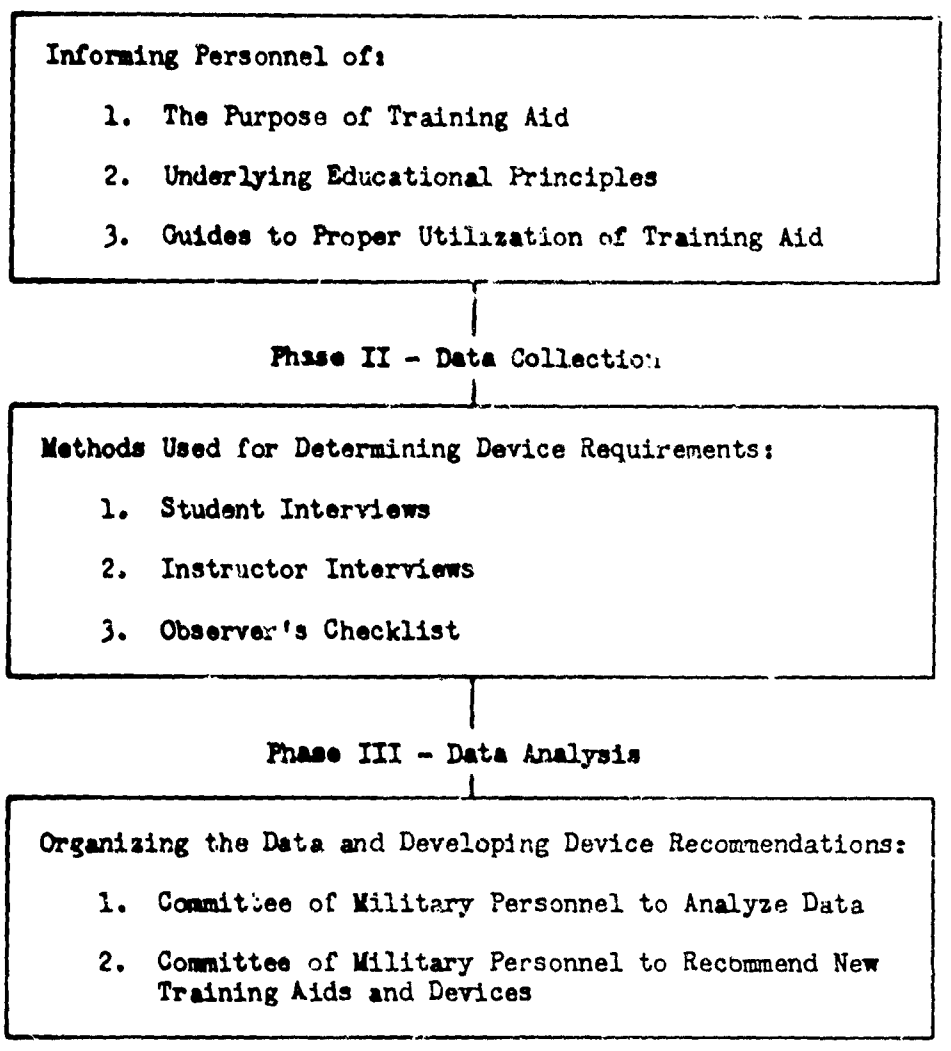
[1] A supplement to this report contains fifty-six recommendations for new devices at Camp Lejeune, North Carolina, "Specific Recommendations For New Training Aids and Devices Developed at the Marine Supply Schools, Camp Lejeune, North Carolina". Supplement to Technical Report SDC 383-0h-1.

SUMMARY

This guide describes a method whereby a military activity can determine its requirements for training aids and devices. The procedure was developed by a research team working in cooperation with the military personnel of the Marine Supply Schools, Camp Lejeune, North Carolina. The method consists of three phases which are illustrated graphically in the following flow chart:



At Camp Lejeune, this procedure was effective in indicating the various aids and devices which should be incorporated into the curriculum. A supplement to this report contains findings of the Lejeune study in the form of fifty-six recommendations for new devices.

INTRODUCTION

The purpose of this guide is to outline a method for ascertaining the training aid and device requirements of a training program. Most training installations could benefit from the inclusion of additional aids and devices. Too often this need is satisfied by "instructor-invention," that is, the instructor has an idea and so writes up the requirements for the aid. There are, however, more systematic and desirable methods of attacking the problem. The instructor's idea may be a good one, it may be based on long experience with training problems and it may be a real help to explain a difficult concept. However, the instructor because of his particular teaching technique, and his inability to keep abreast of development in engineering and educational psychology, often suggests an aid which may not be best for all instructors and does not effectively meet the requirements of the particular training situation. In fact an instructor's close association with a training program may tend to make him so familiar with it that he loses sight of the parts which cause the student difficulty. This does not mean that instructors' opinions are not to be sought in the development of devices but rather that instructors' opinions must be collected systematically and related to information from other sources.

This guide is concerned with a method of determining the device requirements of a training program. This method can be used by military personnel in developing their own requirements for training equipment. As indicated in the flow chart, Phase I outlines the initial orientation of instructors, Phase II, the forms to be used during the data-gathering process and, in Phase III, the final writing of device requirements are discussed.

Setting

The methods described in this report were developed and field tested at the Marine Supply Schools, Camp Lejeune, North Carolina. This training installation consists of three separate schools, which principally train enlisted personnel as follows:

(1) Supply School of Administration: training in Supply administration.

(2) Motor Transport School: training in vehicle operation and maintenance.

(3) Food Service School: training of cooks, bakers, stewards and mess management personnel.

The Director of the Supply School made available personnel at all levels who worked jointly with the Contractor during the course of the project. This staff cooperated, constructively criticized and were of inestimable value in helping to develop the procedure described in this report. The research team gratefully acknowledges their assistance which contributed in a very real sense to a successful completion of the project.

PHASE I - ORIENTATION OF PERSONNEL

STUDY

Why Do We Need an Orientation Course?

As indicated in the flow chart, step one in any requirements study should consist of an orientation course for the participating personnel which will describe the purpose of and reasons for using training aids and devices. Once this course is completed the military personnel will be better able to decide which problems can be solved through the introduction of training aids and devices and which problems can only be solved through other methods such as changes in course syllabi, administrative action or more extensive instructor training.

All instructors involved in training activities will find this orientation useful, since one of the limiting factors in the effectiveness of any new device is the manner in which it will eventually be utilized. However, it is not always possible or even feasible to prepare every instructor for a device requirement study.

More specifically then, the following classes of personnel should probably be selected to receive full training: (1) military personnel who will undertake the requirements study and personnel who will be responsible for scheduling the device in the course syllabi; (2) instructors who are just beginning or are in the early stages of their tour of duty and who will eventually use the training aids; (3) heads and assistant heads of schools who are responsible for the overall coordination of the activities of the training program, and finally; (4) civilian educational consultants if they are available.

A Summary of the Orientation Course Describing the Purpose of Training Aids and Devices

The following orientation course consists of an outline of the purposes of training aids and devices, reasons for using them, and finally, effective methods for their utilization. An outline of this orientation course is now presented, as a suggested model for a training activity. It should be pointed out that this outline can be modified to fit the particular needs of the installation where the course will be taught.

COURSE CONTENT

A. General Introduction to Orientation Course

The principles of learning and their application to the development and utilisation of training aids and devices will be discussed in this orientation course.

All studies stress the point that training aids and devices cannot be isolated from the educational program, but rather must be regarded as an integral part of it. It is also important to note that a training program cannot be built around the use of training aids. In a realistic situation, course outlines are already prepared and then these are examined to ascertain at what points training aids and devices can best be utilized.

It must always be remembered that training aids are a means of reaching the goals of the training program and hence cannot be considered ends in themselves.

1. Reasons for Using Training Aids and Devices

Too often the instructor fails, when using just the straight lecture methods, to "put across" the desired knowledge. The student gets lost in a maze of words and fails to grasp the essential points of the instructor's lecture. Training aids and devices are employed as an aid in overcoming this "breakdown of communication." Through use of these aids, the student can see how difficult ideas or concepts are demonstrated in concrete and practical terms.

Briefly, the value of training aids lies in:

a. Their ability to demonstrate on a practical level difficult ideas which the instructor is trying to explain.

b. Their appeal to more than one of the student's senses (e.g. seeing as well as hearing.)

c. The fact that a reproduction by a device of a process is superior to a simple word description.

d. Their ability to attract and hold attention.

e. Their ability to focus the attention of all students on one item at a time.

2. How to Incorporate a Training Aid or Device into the Curriculum

A training aid is best utilised when it is properly integrated into the curriculum. The following steps are suggested when incorporating the training aid or device into the curriculum:

a. Consult the course outline.

Does it indicate that the device or aid will fit in at this point or is it far too complex for the level of the student information. Too complex an aid or device will only serve to confuse the students.

Consider whether the device or aid will actually aid in the presentation of the required material or will the subject matter of the course have to be changed in order to use it? Only those aids that contribute directly to the subject matter as outlined in the course outline should be considered.

b. Review the device or aid with the instructor.

What are their opinions of it? Do they think they will be able to use it properly? The instructor needs to know and understand the purposes for which the aid is being used as well as how to use it.

c. Survey the classrooms in which the device or aid is to be used.

Is the size of the device appropriate? Will the students be able to see it?

Failure to consider these points when deciding whether or not to incorporate a device or aid into the training program may lead to its failure when in actual use.

3. How to Incorporate a Training Aid or Device into the Specific Course

a. Preview the use of the training aid or device.

Such a preview allows the instructor to gain experience in its purposes, manner of utilization and shortcomings. Loss of instructional time and general disorganization results from insufficient knowledge of the device and how it is to be used.

Critically examine the aid to discover where instructional emphasis should be placed. If emphasis is put on the wrong portion of the work, essential points may be overlooked, and the training aid will serve only a small fraction of its potential worth.

b. Don't over-use or under-use the device or aid.

Students can become annoyed and disinterested when they have spent too much time with a simple demonstration of well understood principles. On the other hand, students can become confused and arrive at wrong conclusions when too little time has been given to difficult concepts.

c. And finally, the instructor should keep in view the objectives towards which he is working. He must realize that the aid is used to clarify a concept, not to teach it. It should help to integrate the material and should serve as a source of motivation for the student.

How to Make a Decision About Whether to Use a Demonstration or a Laboratory Exercise?

When to Use a Demonstrator

Demonstrations are instructional shortcuts. Rather than trying to "put across" difficult ideas through straight lecturing,* the instructor, by using demonstrations, can graphically illustrate what he is trying to explain. A study of the course outline will indicate many places where some new idea or principle is being introduced. It is at these points that demonstrations should, if possible, be included.

Which One to Use?

What type of training aids and devices best lend themselves for demonstration purposes? The answer to this question lies in the type of material being taught and its level of difficulty. Simple charts, diagrams and scale models may be sufficient. On the other hand, to illustrate some complex principles may call for cutaway models with moveable parts or some actual equipment which lends itself to demonstration purposes. The final standard to be considered in choosing the equipment to use, is whether the aid or device in an economical manner will help the student better understand the material that the instructor is trying to teach.

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* Recent experimental evidence has indicated that some skills can also be taught through demonstrations. See SDC Technical Report 269-7-11 and 269-7-17.

When to Use Laboratory Exercise

If the student must have direct experience in doing something, e.g., learning a skill, then a laboratory situation is appropriate. More specifically, a laboratory set-up should be used when the course outlines require:

1. Practice in manual skills.
2. Practice in construction or repair of equipment.
3. A basis for the understanding of principles, laws, and their practical application
4. Actual experiences with the operation and maintenance of real gear.
5. The development of favorable student attitudes towards the importance of doing careful and accurate work.

Which One to Use?

The following factors should be taken into consideration when deciding which training aid or device to employ:

1. The goals of the training program. Will the device teach what is needed?
2. The available laboratory space.
3. The number of instructors.
4. The level of ability of the students.
5. The structural qualities of the device.

B. How is a Demonstration Properly Conducted?

1. Preparation:

Before the demonstration, the instructor should prepare an outline of what he will say, when he will say it, and the materials he will use. If possible he should rehearse his demonstration before an audience of at least two persons. All the equipment necessary for the demonstration should be checked beforehand. One risks the loss of the interest and attention of the audience when he interrupts a demonstration to look for, or repair, a piece of equipment. Before the demonstration, written material introducing and summarizing the concepts to be covered, should be distributed to the students. These information sheets can be retained by the student and used as a review of the demonstration.

2. Presentation:

The procedure for conducting properly a demonstration may be summarized as follows:

a. The demonstration should be kept simple. The instructor shouldn't confuse the student with detailed and often unnecessary refinements. As an aid to simplification he might put the key points on a blackboard or a chart to guide the student.

b. The device or aid should be placed where every student can see the demonstration. If necessary, the instructor should have the class gather around it.

c. The instructor should not digress from the main points of the lecture, but should follow his prepared outline. If a student asks a question which is not pertinent at that particular time, it should be postponed with an explanation that it will be answered at a more appropriate moment.

d. The pace of the lecture should be at the level of the student's ability to comprehend and benefit from the demonstration. The instructor should continually check for signs of inattention, lack of understanding, disagreement or confusion.

e. Constant summarizing of the various points will also serve to clarify and give the student time to note the important points. At the end of the demonstration, the major points should be restated. This will result in useful discussions and help to organize the demonstration into a meaningful whole.

f. Following the demonstration, an informal examination of an objective nature, i.e., true-false, completion, multiple choice, or matching may be given. The results will help identify the points that failed to get across, so they may be reviewed.

C. How the Instructor May Evaluate His Demonstration

In order to ascertain the effectiveness of his demonstration, the instructor may ask himself, or the students, the following questions:

1. Was the purpose of the demonstration clear to the students?

2. Were the materials and equipment carefully selected, prepared, and arranged for presentation?

3. Were the generalisations and principles emphasised?

4. Was the speed of presentation too fast or too slow?

5. Were new technical terms introduced with a definition and written on the blackboard?

6. Was the audience's reaction observed to get cues as to the progress of learning?

7. Were questions permitted and answered to clarify understanding?

8. Was the demonstration tied into previous learning and pointed towards future work?

In the event that the answer to one or more of these questions is unfavorable the instructor should take action to remedy any deficiencies for the next presentation.

D. How is a Laboratory Exercise Properly Conducted?

1. Preparation:

The following points should be covered by the instructor when preparing for a laboratory session:

a. Check the physical condition of the equipment and prepare it for use.

b. Organise the material needed by the students.

c. Prepare the student by means of prior reading assignments and explanations. The assignments should not only include the plan for the exercise, but also adequate instructions to make certain that the student understands the objectives of the unit.

2. Presentation:

The principles and procedures for supervising and assisting laboratory learning are not essentially different from classroom demonstrations. Some of the factors to keep in mind are:

a. Keep in close contact with each student's progress in order to catch errors and prevent poor work habits before they really get established.

b. Let the student do it — just guide him. Student must make some of his own errors and react to them as errors, before he can really learn.

c. It is helpful to encourage the student when it appears that he is confused. Give him some guidance or try to find out where and why he's having difficulties. In fact, some of the questions one of the students asks may also be bothering the other students and it might be desirable to pause and answer some of the problems for the whole class.

d. Permit cooperative work or discussions among the students when they are reviewing the subject matter so long as it still permits the student to develop his own skills.

e. Keep everyone working, supervision is required to insure that the students do not waste their time through inactivity and "horseplay."

f. Establish good working habits by requiring students to neatly and safely store their work and materials.

g. At the completion of each unit during the laboratory work and at the completion of an entire segment of a course, the instructor should summarize and review the work accomplished. The student should be allowed to question extensively at this time and further the instructor should probe with his own questions to ascertain the degree of learning.

h. Give tests or examinations (performance, written, or both) covering the principles involved. Supplementary assignments should be given to cover the weak points as revealed by the examinations.

B. Evaluating the Laboratory Session

Better student performance in the future should be implemented on the basis of the results obtained by the instructor in the laboratory questioning during the summary and from the tests. Essentially the same critical self-evaluation questions outlined on page eight (8) may be applied by the instructor to determine the effectiveness of the laboratory sessions.

SUMMARY OF PHASE I

As can be seen from this course outline, the effectiveness of a training aid or device depends on (1) the care with which it is originally selected, and, (2) the manner in which it is utilized in the classroom. Thus, it is important that the personnel responsible for the development of recommendations for new aids and devices, consider both of these factors. They must decide whether the device or aid will really meet the needs for which it is being selected and, further, whether it can be properly utilized once it has been incorporated into the curriculum.

PHASE II - DATA COLLECTION

Specific Techniques

Once the instructional personnel have been oriented in the use of training aids and devices, as outlined in Phase I, they can then proceed to the next phase of the device requirements study.

The goals of Phase II are to obtain information on the specific problem areas in the training program which can be solved through the introduction of training aids and devices.

Three methods are used in uncovering these problem areas:[1]

1. Student interview
2. Instructor interview
3. The Observer Check List

The procedures were designed to obtain systematic information about the problem areas through different sets of eyes: from the student's viewpoint, from the viewpoint of the instructor who is attempting to put across a difficult point in the subject, and finally to the individual who observes the classroom demonstration. The integration of what is seen from these different points of view gives a more complete picture of the existing strengths and weaknesses of the training program and consequently would assist in developing recommendations for appropriate and effective training equipment.

A. Student Interviews

1. Introduction

The purpose of these interviews is to isolate student difficulties with the subject matter of specific courses. Questions in this form cover six areas of student training. These are: General problems, Instruction Training Aids, Notebooks and Handout Material, Examinations, and Specific Problems.

2. Choice of Sample for Student Interviews

In any large military establishment, a representative sample of trainees who are exposed to the particular problem being investigated should be selected.[2]

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[1] Specific forms are included in the Appendix.

[2] Three methods of obtaining representative samples are suggested: 1) If, for example, you want 30 students out of 150 (whole group), then take every fifth name from the rosters of class rolls; 2) Names of all in the large group may be written on slips of paper, placed in a hat or box, shaken up, and the needed number drawn; 3) Select by means of a Table of Random numbers, e.g., as shown in the appendix of Edwards, A. L., Experimental Design in Psychology, Rinehart and Company, Inc., 1950.

A recommended procedure for choosing these individuals can be summarized as follows:

a. Obtain the class lists or rolls and choose, at random, a sample of at least 10 students.

b. Send to the heads of the schools, at least a week in advance, the list of students who will be interviewed so that schedules can be modified to avoid any disruption in class routine.

3. Conducting Interview

In all interviews it is recommended that direct questioning be kept at a minimum and the interviewee encouraged to talk about any aspects of the training situation that he considers important. Guidance should be given by the interviewer only when it is felt that certain important areas are not adequately covered.

The actual interviewing should be conducted under conditions that insure quiet and privacy. The first step in the situation is the establishment of a friendly relationship between the interviewer and interviewee. This can be accomplished by explainirg the purpose of the interview and giving assurance that the interviewee's name will not be recorded. It may also be pointed out that the interviewee's responses will be combined with other interviews, so that there will be no possibility of identifying the respondent through his answers.

The first few questions on the Student Interview Form are fairly neutral in nature, so that any initial nervousness on the part of the interviewee can be dispelled. Student interviews may be expected to last approximately 50 minutes.

4. Organising the Data:

A blank copy of the student interview forms may be used as a master sheet for the tabulation of responses. The questions in Part I of the form, used primarily in establishing rapport, need not be tabulated. The tallying of the other answers should be done at the end of each interview day. When general trends become apparent, i.e., when a large number of students give the same answer, usually at the end of about 15-20 interviews, interviewing may be stopped. In tallying the answers, simply count up the manner in which students answer each question. For instance, Part IV, question 3 of the Student Interview Form would be tallied as follows:

Number of Students Answering Yes	Number of Students Answering No
15	3

These sample tallies could then be readily computed into percentages.

B. Instructor Interview Form [1]

1. Introduction

Instructor Interview Blanks are used to discover training problems and to isolate units of study which are especially difficult to teach. This is always done, of course, with the point of view that training aids can help solve some of these training problems.

Two forms are used in interviews with instructors. Form 206-2B is a two page blank covering general information about the school. Form 206-2BB covers instructional problems on the specific subjects taught.

2. Choice of Sample for Instructor Interview

In most training installation it will be possible to interview all the instructors teaching particular courses. However, if this is not feasible, sampling procedures can be employed as previously discussed in the section on student interviews.

3. Administration of Interview

As in the case of the students' interviews, an atmosphere of friendliness must be established. The instructor is told that his name will not be recorded, nor will his statements and opinions be identified. The introductory questions are matter-of-fact and do not involve controversial material. The goals of the project should be clearly outlined since an understanding of these goals by the instructor will help him give the necessary information during the interview. When interviewing Form 206-2B is used first, follow with Form 206-2BB.

The conditions under which the interview should be administered are the same as those for students. About an hour and one half is needed for each instructor interview.

4. Organization of the Data

Forms 206-2B and 206-2BB are analyzed similarly to the student interviews. Instructor's responses to each question, with the exception of those in Part I, are tallied on a blank interview form.

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[1] Cf: Appendix

C. The Observer's Check List.

1. Introduction

The purpose of this instrument is to assist a classroom observer in an appraisal of the student-instructor relationship.

The instrument contains a total of one hundred and eleven specific items describing classroom behavior and eight general or summary items. Each item is stated in positive terms and utilizes a three point rating scale.

2. Choice of Classrooms to be Observed

An attempt should be made to observe sections of all the classes in session during the study. If it is impossible to observe all the classes, then classes should be chosen which are representative of various stages in the training sequence (i.e., elementary, intermediate, and advanced phases.)

3. Administration of the Observer's Check List

The observer should arrive before the beginning of the class, introduce himself to the instructors, stating the purpose of his visit. He should be as unobtrusive as possible. Allowances should be made for the tension which the instructor will feel for the first few minutes of the session. Therefore, actual rating, if possible, should not begin until about the middle of the class period when the instructor is operating at more nearly his usual level of proficiency.

In using the checklist, each item on the list should be considered as separate and distinct from every other. The observer should rate each item according to the degree of adequacy of the observed behavior. For instance, item 7 on the checklist calls for the observer to rate the degree of adequacy with which the instructor "gives directions" to his class. The observer may rate this behavior as "somewhat lacking," "adequate," or as "exceptional."

4. Organising the Data

For each part of the Observer's Check List, it will be possible to secure an average score. The procedure for computing this average is simple and can be, for example, illustrated by using Part II of the check list.

Instructor Somewhat Lacking	Instructor Adequate	Instructor Exceptional	
			1. He presents a favorable appearance.
			7. He produces an effective lecture....
			8. He uses well the proper teaching techniques....
0	1	2	Scoring Weights
3	4	1	6
Number of Items Marked - 8			

In this sample case, the instructor was rated on 3 items as "somewhat lacking," on 4 items as "adequate" and on one item as "exceptional."

If an item is rated "somewhat lacking," it is scored .0. If an item is rated "adequate," it is scored 1.00. If an item is rated "exceptional," it is scored 2.00.

To compute the average rating for Part II, the number of times a rating was given of "somewhat lacking," or "adequate," or "exceptional" is multiplied by the weight given to these alternatives. These subscores are then added together and divided by the total amount of items rated. In the above illustration, an average score would be:

$$\frac{(3 \times 0) + (4 \times 1) + (1 \times 2)}{8} = \frac{6}{8} = .75$$

This average score of .75 could then be compared with a scale that runs from 0.0 to 2.0. A score of 1.0 is considered average, less than 1.0, below average, and greater than 1.0, above average. In this case the score of .75 is slightly below average and is indicative of possible problem areas.

PHASE III - DATA ANALYSIS

Committees for Analyzing Data and Developing Recommendations

A. Introduction

Once the data have been collected, it must be integrated and recommendations developed. Two basic questions to be answered are: "What are the problem areas in the training program?" and "Which problems may be solved through the introduction of training aids?"

This phase of the requirements study can be handled most efficiently through the organization of committees. These committees should consist of individuals who participated in the orientation course (Phase I); each committee being responsible for one particular area in the development of final recommendations.

The following committees should be formed: (1) Committee on Integration of Data and (2) Committee on Device and Aid Recommendations.

1. Committee on Integration of Data:

   This committee should be responsible for the analysis and integration of the data obtained from the interviews and observer's check lists. They should also prepare a list of problems found in each course. This list should then be forwarded to the second committee.

2. Committee on Device Recommendations:

   This committee should be responsible for the development of recommendations for new training aids and devices. These recommendations should be based on an analysis of the problems forwarded to them by the Committee on the Integration of Data. Further, this committee should also consider whether the devices can be constructed locally, or whether the recommendations should be sent to the Special Devices Center for consideration.

   Through the utilization of these two committees, the requirements study, as a whole, will be shortened, since this division of labor prevents duplication of effort and allows each group to concentrate on specific goals.

B. Responsibilities of Committees

1. Committee on Integration of Data:

   It is recommended that the size of this committee be limited to about six or seven members. It may be found that this group will have to be

trained in methods of analyzing the interviews and classroom observation data. If this is found necessary, practice should be given in tallying and computing simple averages and percentages.[1]

The committee should work from the point of view of isolating specific training problems. One can recognize these problems by an examination of the results obtained from the interviews and the classroom observations. When a majority of students or instructors report deficiencies in the training program or when an area in the observer's checklist receives a low rating, then the committee should consider these findings to indicate a problem area. Following are sample reports which can be used as a guide when reporting results:

Sample Form

Course: Auto Mechanics Course
To: Committee on Device Requirements
Problem: Teaching starting motors, distributors, generators, and carburetors: Twelve out of fourteen students interviewed reported that they had the most trouble with these units. The units are often taught by displaying the assembled unit itself. This is of very little value as the working parts of importance, in each instance, cannot be seen or their function understood. All instructors concerned with teaching these units recommended cut-aways or glass models.

2. Committee on Device Recommendations:

The task of this group is to analyze the training problems that are presented to them by the Committee on Integration and develop recommendations for new training aids. In order to successfully carry out this purpose, it is recommended that the committee avail itself of the services of the Academic Aids section.[2] Working in close conjunction with this group of specialists will facilitate the development of device requirements. Further, the Academic Aids section can advise the committee as to which aids and devices can be constructed locally and which ones should be requested from the Special Devices Center at Sands Point, Port Washington, N. Y. In many instances when Special Devices Center studies these requirements they will be able to provide the activity with alternate and possibly improved equipment.

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[1] It is suggested that Smith's Simplified Guide to Statistics (Rhinehart-1948) be used as a source-book for these methods.

[2] This group may have a different name at various installations. However, they are usually concerned with the construction and maintenance of training equipment.

When setting up requirements for new devices, the committee should keep in mind the following questions:

a. Will the training aid or device make the student more critical?

b. Will the training aid or device give an accurate picture of the concepts which it should represent?

c. Will the aid or device contribute meaningful content to the topic under study?

d. Will the aid be suitable to the level of abilities and experience of the learner?

e. Will the aid be worth the time and effort involved?

f. Has the most appropriate media been chosen?

g. Are the necessary functional characteristics and performance requirements represented by the chosen aid or device?

h. Can the device or aid be economically maintained or does it require skilled technical personnel?

i. Can the device or aid be readily integrated into the present curriculum.

The following is a sample report which can be used as a model by this committee:

Sample Form

School: Supply School
Problem: Student difficulty in learning "nutrition."
Description of Qualities: An aid in the form of charts and a film should help students to understand the general contribution of carbohydrates, proteins, etc., to the human body and the principles of nourishment. These aids should emphasize what high caloric foods are and what foods furnish the most of certain vitamins.

Additional charts of the food values of the general classes of food are needed.

Films showing the effects of good and poor diet on human beings.

Conclusions

This guide has outlined a simple and effective method for determining the training aid and device requirements of a military installation. It will be possible to apply this technique in a wide variety of training situations. One will achieve the most effective results by utilizing this procedure in its present form, however, it can be modified slightly to meet the needs of a particular training center.

In summary then, this method has much to recommend it. It has proven very successful in a trial run at a major activity such as Camp Lejeune, North Carolina and will solve many of the knotty problems facing a training staff when they require an aid or device to help supplement their program. Further the training aids and devices that are acquired through this method will have the advantage of being selected to solve the specific needs of a training program. This procedure will also increase the possibility of the aid or device being put into extensive use because they are actually "tailored made" to help achieve the educational goals of the course.

Once the recommended training aid or device has been integrated into the program, a follow-up study might prove valuable to determine if the training equipment is being properly utilized. It is suggested that SDC Technical Report 383-7-2 be consulted for an outline of methods to be employed in this follow-up study.

APPENDIX

	Pages
STUDENT INTERVIEW FORM	1 - 6
INSTRUCTOR INTERVIEW FORM 206-2B	7 - 8
INSTRUCTOR INTERVIEW FORM 206-2BB	9 - 15
OBSERVERS CHECK-LIST	16 - 20

STUDENT INTERVIEW BLANK

I. General

1. What course are you now taking? _____

_____

2. What other courses have you completed at this school? _____

_____

_____

3. Is taking this course more interesting than other billets you have had in the Navy? _____

_____

_____ Yes _____ No_____

4. What particular aspects of this course do you like (most), (least)? _____

_____

_____

_____

5. Do you consider what you are doing important to the Navy? _____

_____

_____

_____ Yes _____ No_____

a. To your own future? _____

_____ Yes _____ No_____

b. Do your friends think it important? _____

_____ Yes _____ No_____

II. Instruction

1. Do the instructors cover the material they test you on? _____

_____

_____ Yes_____ No_____

2. Do they have a broad knowledge of the subject? _____

_____

_____ Yes_____ No_____

3. Are they able to answer questions related to but not specifically covered by the syllabus material? _____

_____

_____ Yes_____ No_____

4. Do instructors always have a lecture prepared?_____

_____

_____ Yes_____ No_____

a. How can you tell? _____

_____

5. Do the instructors make an effort to interest you in the subject matter? _____

_____

_____

_____ Yes_____ No_____

a. Do his examples command attention? _____

_____

_____ Yes_____ No_____

6. Does he thoroughly cover difficult points?_____

_____

_____ Yes_____ No_____

7. Do you do work outside of class which is not specifically assigned by your instructor? _____

_____

_____ Yes_____ No_____

8. Does your instructor make you feel at ease in class?_____

_____

_____ _____ Yes_____ No_____

9. Does the instructor take a personal interest in the students' school problems?

_____

_____ Yes_____ No_____

10. Do you feel that you will be able to handle the billet for which you are being trained? _____

_____

_____ Yes_____ No_____

a. If not, why not? _____

_____

_____

III. Training Aids

1. Which of the following do you consider adequate?

Accoustics _____

Blackboards _____

Ventilation _____

Lights _____

Seating _____

2. Does the instructor properly display and use available training aids? _____

_____

_____ Yes_____ No_____

3. Do you find that training aids help you to learn? (blackboard displays, models, charts, cut-a-ways) _____

_____ Yes_____ No_____

a. Are they presented at appropriate times? _____

_____

_____ Yes_____ No_____

b. In your opinion, are they related to the job you are expected to learn? ___

_____

_____ Yes_____ No_____

IV. Syllabus

1. Is the student hand-out material written so that you can understand it? _____

_____

_____ Yes_____ No_____

a. Do they help you to follow the lectures? _____

_____ Yes_____ No_____

b. Does it include too much material? _____

_____

_____ Yes_____ No_____

c. Do you think it might be used in your future billet as reference material?

_____

_____ Yes_____ No_____

2. Would you know how to obtain more detailed information about topics covered in class? _____

_____ Yes_____ No_____

a. How would you go about it? _____

_____

3. Is there too much useless and outdated material in the hand-out materials?

_____

_____ Yes_____ No_____

4. Is the hand-out material given to you in such a form that it may be handled easily? _____

_____

_____ Yes_____ No_____

5. If you needed specific information which you knew was discussed in the hand-out materials, would you be able to locate it? _____

_____

_____ Yes_____ No_____

6. Do you have any suggestions for improving the syllabus? (List for specific courses)_____

_____

_____

_____

_____

V. Examinations

1. Are examinations given too frequently? _____

_____ Yes_____ No_____

a. How often? _____

2. Do the examinations, themselves, teach you anything about the subjects they cover? _____

_____ Yes_____ No_____

3. Do you easily understand all of the items on examinations? _____

_____

_____ Yes_____ No_____

4. Do examinations cover (only) the material given in class? _____

_____

_____ Yes_____ No_____

5. What kinds of examinations do you prefer? _____

_____

_____

_____

6. Do you think your grades on examinations are an accurate measure of your knowledge? _____

_____

_____ Yes_____ No_____

7. Do you receive the results of your examinations? _____ Yes_____ No_____

a. When? _____

b. Are they explained? _____ Yes_____ No_____

8. Do examinations help you to find out where you are weak? Yes_____ No_____

a. Strong? _____ Yes_____ No_____

b. How to improve? _____ Yes_____ No_____

VI. Specific Problems

1. What particular part or unit of the course has it been most difficult for you to learn or understand? _____

_____

a. How could the instruction be changed so that the learning would be easier?

_____

_____

2. Any other part or unit of the course that has been particularly difficult for you? _____

a. How could this be changed to make the learning easier? _____

_____

INSTRUCTOR INTERVIEW BLANK
Form 206-2B

1. Rank_____ 2. Age _____ INTERVIEWER _____

3. Length of Service _____

4. Education _____

5. Courses or Sub Courses Taught:

a. No. of Course _____ Title _____
b. No. of Course _____ Title _____
c. No. of Course _____ Title _____
d. No. of Course _____ Title _____
e. No. of Course _____ Title _____
f. No. of Course _____ Title _____
g. No. of Course _____ Title _____

6. Are you kept oriented on what is going on within the supply schools?

Adequately:_____; Inadequately:_____; Explain:_____

_____

7. What collateral duties do you have - additional to those of instructor? _____

_____

_____

8. How much time do they require weekly? _____ hrs.

9. How many hours do you teach weekly? _____ hrs.

10. How many hours do you spend weekly in preparation for your courses? _____

_____ hrs.

11. Do you feel that your work is considered important by officers in other branches of this establishment? Yes_____ No_____; Explain_____

_____

_____

12. Would you prefer a transfer to a non-teaching assignment? Yes_____ No_____

Explain_____

13. How much freedom do you have in determining what is to be covered during a particular lecture hour? Little_____; Great Deal_____; Explain_____

14. Are you ever consulted in the preparation of new syllabus material? Yes_____ No_____; Explain_____

_____

15. Are you provided with clerical and stenographic assistance? Yes_____ No_____ Explain_____

_____

16. Of the things we have discussed, what are the best features of the Training Program of which you have been a part? (Rank them)

1) Lectures_____; 2) Syllabi Material_____; 3) Hand-Out Material_____; 4) Laboratory or Practice_____; 5) Examinations_____; 6) Training Aids_____; Explain_____

_____

17. The worst? 1) Lecture_____; 2) Syllabi Material_____; 3) Hand-Out Material_____; 4) Laboratory or Practice_____; 5) Examinations_____; 6) Training Aids_____; Explain_____

_____

18. What remedial actions would you suggest? _____

_____

_____

_____

_____

INSTRUCTOR COURSE INTERVIEW BLANK
Form 206-2BB

1. Rank_____ _____ INTERVIEWER_____

2. Course (or Sub Course) No._____; Title_____

3. Periods of Instruction_____; No. of Students_____

I. Instruction

1. Types of Instruction: Lecture_____; Discussion_____
_____; Demonstration_____;
Practice_____.

2. Is the syllabus material organized so that you can follow it easily? Yes_____
No_____; Explain_____
_____

3. Is it well written? Yes_____ No_____

4. Is the language always easy to understand? Yes_____ No_____

5. In what area is it weakest? _____
_____
_____

6. How much material is contained for a given class period? Too much_____;
About right_____; Too little_____.

7. Is any of the material out-dated or irrevelant? Yes_____ No_____; Explain:
_____

8. How do you present your lectures? Read Prepared Lecture_____; Lecture
from outline_____; Ask questions (quizzing)_____; Carry on
discussion_____.

9. How do you go about making difficult points clear? Examples_____; Training Aids_____; Stories_____; Diagrams_____; Questions_____; Personal Enthusiasm_____.

a. Which is the most effective?_____

b. Give examples: 1)_____;

2)_____;

3)_____

10. Try to recall typical questions asked you in class by students. Tell them to me and I will write them down.

1)_____

2)_____

3)_____

4)_____

5)_____

6)_____

7)_____

11. Is the student hand-out material written so that students understand it?

Adequate_____; Inadequate_____.

a. Is there too much?_____; About right?_____; Too little?_____.

b. What part of it is weakest?_____

_____

Why?_____

How could it be improved?_____

_____

12. How much work do you do weekly in preparation for this course?_____hrs.

II. Training Aids

1. Which of the following do you consider adequate for the course?

Acoustics_____ Blackboards_____
Ventilation_____ Lighting_____
Seating_____ Disturbances_____

Explain why any are inadequate_____

_____

2. What kind of training aids do you use? Indicate usual ones.

a. Display boards_____

_____

_____

b. Mock-ups_____

_____

_____

c. Classroom aids_____

_____

_____

d. Trainers_____

_____

_____

e. Films and film strips_____

_____

_____

f. Charts_____

_____

_____

g. Cut-aways_____

_____

_____

h. Others_____

_____

_____

3. Which of the above are improperly used or introduced too early or too late in the course?_____

4. Which of the above training aids could be brought in (integrated) to show better how things are done on the job?_____

5. What changes in the above training aids could be made to improve their effectiveness?_____

6. What new training aids would you suggest to improve the instruction? Where in the course would you include them?_____

III. Students

1. Are the students usually interested in this course? Yes_____ No_____; Why?

   a. What proportion of students are uninterested?_____%

   b. Describe the characteristics of the students who are uninterested_____

2. List the lessons of the course:

Most Interesting to the Student	Least Interesting to the Student
a.	a.
b.	b.
c.	c.
d.	d.

3. When the students enter your course in what are they weakest? How?

a. Arithmetic_____

b. Writing Ability_____

c. Reading Ability_____

d. Study Methods_____

e. Mechanical Ability_____

4. What proportion of the students in the course give evidence of adequate study habits?_____%. What are the main difficulties of students in their outside study?_____

_____

_____

5. What disciplinary problems do you have with students?_____

_____

_____

6. How many students ask you for individual help in the course during a week? No. _____; No. of different students?_____.

a. How much time do you spend in this work?_____ hrs. per week.

b. Could you spend more time in this to advantage?_____

c. What typical questions do they ask you?

1)_____

2)_____

3)_____

4)_____

5)_____

IV. Examinations

1. Do you consider that the examinations test the knowledge and ability required by the MOS? Yes_____ No_____.
2. Do you consider that the examination grades are accurate measures of the student's progress in the course? Yes_____ No_____.
3. Are examination items understood by the students? Usually understood_____; Occasionally understood_____; Frequently understood_____.
4. When do students receive their grades in the examinations? Same day_____; Next class period_____; Long after_____.
5. Do you go over the examination questions with the students? Yes_____ No_____ In class_____; With individual students_____.
6. Do you prepare _____ the examinations? Assist in preparation of_____ Yes_____ No_____.
7. Do students complain about the examinations? Many_____; Few_____; None_____.

V. Specific Problems

1. What particular unit of the course (sub course) do you have the most difficulty in teaching? _____

_____

_____

a. Why is this so?_____

_____

_____

b. What could be done to improve it? _____

_____

_____

2. What particular part of the course (sub course) appears to be the most difficult for the

a. Average student_____

_____

_____

b. The poor student_____

_____

_____

c. The superior student_____

_____

_____

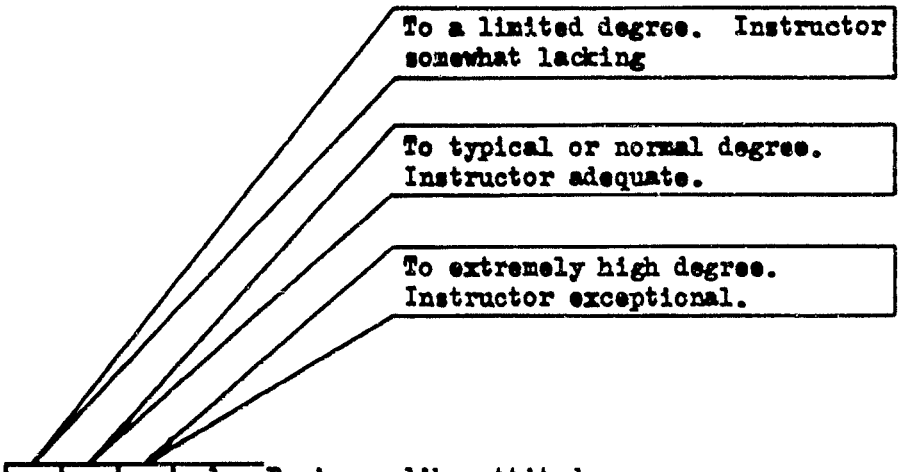
OBSERVERS CHECK-LIST
(Form 206-2C)

Class No. _____ Subject _____

Instructor _____ Rank _____

Observed by _____ Date _____

Part I: Check (✓) in the appropriate box to indicate the extent to which each of the following phrases is descriptive of the instructor observed. Leave blank any which you lack opportunity to observe.



			1. Business-like attitude.
			2. Secures whole-hearted cooperation of class.
			3. Calls on student by name.
			4. Constructive criticism offered students.
			5. Emphasizes student's need for study.
			6. Secures interested attention of students.
			7. Directions given explicitly.
			8. Has appropriate training aids ready for use.
			9. Judges his teaching effectiveness by observing student reactions.
			10. Avoids sarcasm.
			11. "Demonstration" periods well organized.
			12. Transitions are clear.
			13. Lesson is well organized.
			14. Emphasizes value of the subject to the Navy.
			15. Makes personal references only when pertinent to the topic under discussion.
			16. Stresses practical applications.

			17.	Teaches proper study habits.
			18.	Displays apparatus adequately during "Demonstration" periods.
			19.	Introduction is carefully planned.
			20.	Pleasant manner of speaking.
			21.	Avoids being sidetracked into discussion not pertinent to the lesson.
			22.	Explains meanings of new terms.
			23.	Keeps every student occupied constructively during class period.
			24.	Sufficient time alloted during "Application" period to permit the student to manipulate apparatus.
			25.	Covers all points planned for the lesson.
			26.	Definitions of words supported by familiar examples.
			27.	Uses vocabulary within comprehension level of the student.
			28.	Appropriate number oi major points in lesson.
			29.	Compliments students on good work.
			30.	Progresses from known to unknown.
			31.	Expects student to memorize too much material.
			32.	Conducts class in calm manner.
			33.	Asks for questions appropriately.
			34.	Students are industrious during practice sessions.
			35.	Students are attentive during lectures.
			36.	Draws any needed blackboard diagrams before class.
			37.	Goals for the lesson are clearly given.
			38.	Enunciates clearly.
			39.	Fine personal bearing.
			40.	Able to impart his enthusiasm to the student.
			41.	Speaks so that everyone in the room can hear.
			42.	Changes voice inflection for emphasis.
			43.	Sufficient supporting details in lesson.
			44.	Attempts to cover too much subject matter in a class period.
			45.	Motivates the student by stressing interesting materials.
			46.	Seems to be genuinely interested in students as people.
			47.	Arouses and maintains student interest.
			48.	Summary is carefully prepared.
			49.	Allows sufficient time for adequate summary.
			50.	Speed of delivery is appropriate to material.
			51.	Neat and clean in appearance.
			52.	Presents supplementary reference material at appropriate points in lesson.
			53.	Has enthusiasm for teaching.
			54.	Reviews and summarizes frequently.
			55.	Attitude friendly, not haughty or superior.
			56.	Instructor capable of answering questions related to syllabus material.
			57.	Moves logically from known to unknown in teaching.
			58.	Delivers rather than reads his lectures.
			59.	Has patience with student's difficulties in grasping material.
			60.	The major points are clear to students.

			61.	Obviously resents present teaching assignment.
			62.	Makes effective use of pleasing sense of humor.
			63.	Wastes no class time.
			64.	Stresses usefulness of study.
			65.	Uses familiar Navy situations as illustrative material.
			66.	Displays confident manner in front of class.
			67.	Spends too much time on very simple material.
			68.	Gives over-all picture of the lesson in beginning of period.
			69.	Works hard to insure that even his slowest student learns the material.
			70.	Does not show favoritism to brighter students.
			71.	Conclusions contain effective review.
			72.	Inspires confidence.
			73.	Has efficient procedure for distributing papers without causing confusion.
			74.	Uses results of examination for purpose of review.
			75.	Attempts to include all students in class discussion.
			76.	Integrates theory with practical application appropriately.
			77.	Does not "bluff" when uncertain.
			78.	Remains emotionally controlled when answering students' questions.
			79.	Presents material in logical sequence.
			80.	Gives adequate guidance to student during "application" periods.
			81.	Introduction is of appropriate length.
			82.	Purposes of the course are adequately introduced.
			83.	Supporting details are relevant.
			84.	Clarifies questions and discussions when necessary.
			85.	Refers to past learning and points to next lesson.
			86.	Permits student sufficient time for taking notes.
			87.	Impresses people favorably.
			88.	Stimulates curiosity about subject matter.
			89.	Makes sure that the student understands difficult points.
			90.	Emphasizes unfamiliar terms by writing them on the blackboard.
			91.	Emphasizes only the important aspects when subject matter is very detailed.
			92.	Answers questions directly.
			93.	Aim of the lesson is clearly presented.
			94.	Produces desired effect with a training aid.
			95.	Introduction has appropriate content.
			96.	Maintains discipline tactfully.
			97.	Provides effective motivation.
			98.	Knows his subject.
			99.	Stresses general principles whenever appropriate.
			100.	Makes sure that every student can see the blackboard clearly.
			101.	Presentation indicates that instructor has thoroughly prepared the lecture.
			102.	Secures student participation.

			103. Avoids ridiculing student in the presence of the class.
			104. Avoids making personal references about students.
			105. Avoids a series of "don'ts" in training.
			106. Attempts to understand special difficulties of the students.
			107. Shows thorough knowledge of the training aids he uses.
			108. Directs discussion skillfully.
			109. Gives evidence of ingenuity in devising training aids for his own use.
			110. Courteous with students.
			111. Realizes he is working first with people and second with subject matter
0	1	2	Scoring Weights
			Total _____
No. Items Marked			

Part II: Now, after having indicated your observations of the instructor on the specific items listed above, you are ready for the eight summary statements following. Check as above.

To a limited degree. Instructor somewhat lacking.

To typical or normal degree. Instructor adequate.

To extremely high degree. Instructor exceptional.

			1. He presents a favorable appearance.
			2. He possesses desirable voice and speech habits.
			3. He displays an effective personality in the classroom.
			4. His classroom management (physical surroundings, discipline, relationship to student) is effective.
			5. He possesses sufficient knowledge of subject and desirable instructional qualifications.
			6. He makes thorough preparation for class.
			7. He produces an effective lecture or practice period from introduction to conclusion.
			8. He uses well the proper teaching techniques, including student motivation, use of training aids, etc.
0	1	2	Scoring Weights
			Total _____
No. Items Marked			

Write here any pertinent facts which are not covered above, or any points you think should be amplified.

The check-list may be scored as indicated at the conclusion of Parts I and II above. Scores to be reliable should be computed from use of the check-list in observation of the same instructor in several classroom situations (where as many items as possible are checked). The computation of the score for Parts I and II would be as follows:

$$\frac{\text{Total of Item Weights}}{\text{Number of Items Marked}} = \text{Part Score}$$

Compute to two decimal places and average scores of Part I and Part II for the final score.

The score range is 0 to 2, with a mid-score of 1.