Improving the Performance of Corporate Instructional Designers

Karolyn A. Smalley

Follow this and additional works at: https://scholarworks.wmich.edu/masters_theses

Part of the Adult and Continuing Education Commons, and the Industrial and Organizational Psychology Commons

Recommended Citation
https://scholarworks.wmich.edu/masters_theses/1015

This Masters Thesis-Open Access is brought to you for free and open access by the Graduate College at ScholarWorks at WMU. It has been accepted for inclusion in Master's Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact wmu-scholarworks@wmich.edu.
IMPROVING THE PERFORMANCE OF CORPORATE INSTRUCTIONAL DESIGNERS

by

Karolyn A. Smalley

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
April 1991
The purpose of this study was to determine to what extent the job aid developed by Brethower (1968) controlled instructional designers' behavior so that they effectively and efficiently produced performance-based learning programs. This study consisted of developing and testing two iterations of the Analysis-Design Instructional Guide (job aid). Instructional designers who used either version of the job aid were able to meet a higher percentage of general criteria for performance-based learning programs than designers who did not. In addition, they took less time to develop programs than industry norms suggest. Even though the behavior of the designers was not completely controlled by the worksheets, all the worksheets were used to some degree. These results suggest that the Analysis-Design Instructional Guide may enable instructional designers to produce performance-based instruction; and it may enable them to do it in a timely manner.
ACKNOWLEDGEMENTS

I would like to thank the Amway Corporation, Ada, Michigan, and Dwight Sawyer, in particular, for allowing this research to be conducted within the organization. Specifically, I would like to express my appreciation to Mike Bauer, Joel Burke, Randy Elders, Carol Frisch, Sharon Inman, and Ann Linklater for their assistance and patience in implementing the instructional design job aid. I would also like to thank Brenda Heerdt, Tom Higgins, Dora Lezovich, Lowell Otter, and Mary Wendell for their many long hours in reviewing and evaluating learning programs. In preparing and writing this thesis, I have benefitted from the helpful advice and constructive criticism provided by Drs. Alyce Dickinson and William Redmon. Most importantly, I would like to express my sincere gratitude to Dr. Richard W. Malott who accepted me as an advisee starting with this research. His suggestions and supervision have been invaluable. And to Dale, my husband, a special thanks for providing the technology that was the starting point for this research and the positive reinforcement that enabled its progress.

Karolyn A. Smalley
INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
Improving the performance of corporate instructional designers

Smalley, Karolyn A., M.A.

Western Michigan University, 1991
NOTE TO USERS

THE ORIGINAL DOCUMENT RECEIVED BY U.M.I. CONTAINED PAGES WITH SLANTED PRINT. PAGES WERE FILMED AS RECEIVED.

THIS REPRODUCTION IS THE BEST AVAILABLE COPY.
TABLE OF CONTENTS

ACKNOWLEDGEMENTS ................................................................. ii
LIST OF TABLES ............................................................................. v

CHAPTER

I. INTRODUCTION ........................................................................ 1
II. METHOD .................................................................................. 7
   Setting ...................................................................................... 7
   Subjects .................................................................................. 7
   Materials ................................................................................ 8
   Dependent Variables and Raters .............................................. 10
   Procedure ................................................................................ 13
   Experimental Design ............................................................. 16
III. RESULTS ................................................................................ 17
IV. DISCUSSION ........................................................................... 25

REFERENCES .................................................................................. 32

APPENDICES ................................................................................... 34

A. Human Subjects Institutional Review Board
   Informed Consent Letters ....................................................... 35
B. Rapid Analysis Worksheet, Progress Planner Worksheet,
   Mastery Performance Worksheet, and Lesson
   Production Worksheet ............................................................. 42
C. Unedited Examples of Feedback on
   the Guide From the Instructional
   Designers ................................................................................ 51
D. Rapid Analysis Checklist, Progress Planner
   Checklist, Mastery Performance Checklist
   and Lesson Production Checklist ........................................... 59
Table of Contents—Continued

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Program Design Evaluation</td>
<td>64</td>
</tr>
<tr>
<td>F. Instructional Designer Questionnaire</td>
<td>66</td>
</tr>
<tr>
<td>G. Raters Instructional Job Aid, Cover Memo with First Program to Evaluate, and Clarification Memo</td>
<td>68</td>
</tr>
<tr>
<td>H. Analysis-Design Instructional Guide, Version III</td>
<td>74</td>
</tr>
<tr>
<td>I. Rater Matrix and Criteria Met Records</td>
<td>135</td>
</tr>
</tbody>
</table>

BIBLIOGRAPHY                                                                 146
LIST OF TABLES

1. Percentage of Criteria Met for Program Design Evaluation ................................................................. 18
2. Percentage of Criteria Met for Program Design Evaluation of the Pre-intervention Programs ................... 19
3. Hours Per Module of Development Time .................................................................................................. 20
4. Percentage of Criteria Met for Version II and Version III ....................................................................... 22
5. Percentage of Criteria Met for Lesson Production Worksheet of the Pre-intervention Programs ............. 23
6. Usefulness of the Analysis-Design Instructional Guide ................................................................................ 24
CHAPTER I

INTRODUCTION

To stay economically strong and to keep abreast of the competition in the 1990s, organizations are demanding more from their employees. Improving performance in all areas is a key issue. Instructional design staffs are not exempt from this need (Bullock, 1982). Improving the performance of instructional designers becomes a significant issue when we learn that, in 1990, organizations with more than 100 employees spent a total of $45.5 billion for training and development (Lee, 1990). That amount of money may not be alarming if we could clearly demonstrate that the effectiveness of the learning programs we designed "produced a work force capable of meeting the challenges facing America" (Gordon, 1989, p. 39). In fact, we cannot demonstrate effectiveness for most learning programs. The present study examined one area where performance may be improved—the instructional design process.

Today three state-of-the-art instructional design models can be used. Mager's (1988) four-phased model—analysis, development, implementation and improvement—focuses upon the analysis and development phases. The intent of this model is to ensure that instruction is the correct solution for the problem being addressed, that the instructional objectives meet a demonstrated need, that the instruction is adjusted to meet each student's behavior repertoire, and that the instructional methods used enhance a student's desire to learn (Mager, 1988).

The Instructional System Development (ISD) used by the U.S. military is a second significant instructional design model. This model has three key criteria
that designers are to emphasize. They are: (1) all training objectives should be derived from current job requirements; (2) the selection of training strategies needs to lead to efficient instruction; and (3) testing and revision of all instruction will continue until instructional objectives are met. If designers systematically use the repetitive processes within the procedures for this model, training relevance is assured. However, studies show that rigorous adherence to the procedures of the model does not occur and that the three criteria above are generally not met (Branson, 1981; Vineberg & Joyner, 1980).

The newest model has been designed by Joe Harless and is called the Accomplishment Based Curriculum Development System (ABCD). Previously many of the processes Harless used focused on the question, “What do we want the performer to DO as a result of the training?” Today, the question his process asks is, “What does an accomplished performer PRODUCE to help meet the goal?” His more than three years of research, development, and testing show that the training developed by focusing on accomplishments produced is more relevant and effective. In addition, Harless claims that the instructional design time is more efficient and the training material produced requires minimal revisions (Harless, 1988).

One tool that is used extensively within the ISD model (Schultz & Wagner, 1981) and within the ABCD model (Harless, 1988) is job aids. Job Aids are defined as performance aids used to guide or facilitate performance on the job (Booher, 1978; Bullock, 1982; Geis, 1984; Mockovak, 1983). Lineberry and Bullock describe common characteristics of job aids as

- Information is displayed—words, numerals, pictures, symbols, etc.—that enables the user to know what to do....

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
• Each aid serves to minimize the amount that the user must recall or remember in order to perform the activity or task...
• Each aid also assumes that the user brings to it certain prerequisite skills/knowledge... (Lineberry & Bullock, 1980, p. 3).

Job aids have several benefits to the performer. A job aid can reduce or minimize the negative effects of “forgetting” or of making errors (Bullock, 1982). In one study participants were asked to use the general instructions provided by the company to calculate client disability time. These particular instructions were selected because the existing document was well written, the content was technically complex, and the process had the largest number of people using it. In the second phase of the study, these same participants were asked to use an information map (job aid) to calculate client disability time. Participants committed 54% fewer errors when using the information map and reported feeling more “satisfied,” “confident,” and “in control” when using it (Schaffer, 1982).

For performers another benefit of using job aids is that the focus on critical job accomplishments/performance helps ensure that the content is job relevant and systematically organized for easier learning (Geis, 1984). One additional advantage to job aids is that the instructional designer can present the information visually. This, in turn, can enable the learners to quickly scan what is already known and use what they do not know (Horn, 1974, 1975).

The use of job aids creates several benefits for an organization. First, considerable savings in costs can be realized. There is a savings in person-hours for development as well as a cost savings in salaries paid to participants who attend training (Lineberry & Bullock, 1980). Joe Harless described a project where he was asked to produce a week-long course in basic electronics for 200 highly paid engineers. Participants from around the United States were to be flown to
corporate headquarters in upper New York to attend this training. Once the analysis was completed, it showed that an 8-page job aid was needed. This was produced for $24,000 as compared to the millions of dollars it would have cost this organization to run the course for one year (Harless, 1990).

Another benefit to using job aids is that it takes less time to develop job aids than formal training (Lineberry, 1977). Job aids are tailored to specific job tasks, whereas formalized training usually provides for skill practice that demonstrates approximations to the task. In addition, extraneous materials and information are often included in formalized instruction (Bullock, 1982). It also usually takes less time to update or revise job aids than it does formalized training. Since job aids have demonstrated that they can both reduce the cost of training and can improve performance, it seems only appropriate to use them as the key tool to improve the instructional design process.

Other means of improving the instructional design process have been provided by Tom Gilbert (1978) in his book Human Competence: Engineering Worthy Performance. Gilbert describes performance as a combination of behavior and the products produced by that behavior. He recommends looking at the product in the context of its environment to determine its value. Once the product has been identified as valuable, he recommends that trainers focus on it rather than behavior. In addition, Gilbert suggests that one look for the valuable product or "stellar accomplishment" as produced by the very best or exemplary performer; and then, both the stellar accomplishment and exemplary performer should be utilized to design effective efficient training (Gilbert & Gilbert, 1989).

Mager's (1988) model focuses on "valuable" and tries to ensure that worthwhile learning occurs through well-written behavioral objectives, criterion-
referenced tests and appropriate practice. This model does not emphasize accomplishments or outputs. The ISD model focuses on job requirements in order to determine the "stellar accomplishments." This has proven to have limited success because job requirements have not been reviewed in the context of the whole military system; nor have the job requirements been agreed upon by key military stakeholders (Vineberg & Joyner, 1980). Therefore, the military instructional designers do not have a way to ensure that they identify stellar accomplishments; nor do they have a way to stay focused upon them throughout the design process. Consequently, both of these models can result in content-centered learning programs or programs which answer the question "What do you need to KNOW?"

The ABCD model has been built around "worthy accomplishments" or products produced. The products produced also have to meet organizational goals and add value to the organization. In an effort to ensure that the instructional design process captures these critical elements, Harless (1988) designed a job aid. In the development process, he moved from using a job aid with a series of general instructional design guidelines to using a job aid with a set of specific instructional design rules. This resulted in a complex and lengthy job aid that requires extensive training.

An unpublished instructional design model was available (Brethower, 1968). It was in the form of a streamlined job aid that consists of four worksheets. This condensed version was taken from the content of a five-day Advanced Instructional Design Workshop taught by Brethower at the University of Michigan, Ann Arbor. Individuals who attended those workshops had extensive experience in designing learning programs. The original program was too complex for the
novice designer to learn. However, the four worksheets capture the essence of the model and could be readily learned by the unsophisticated instructional designer.

The Brethower model focuses on "worthy accomplishments" or products produced by the exemplary performer. These accomplishments need to add value to the main goals of the organization. This model uses a systems approach and takes into consideration both the external and internal environment. To ensure that only relevant products and environmental conditions are used in the instructional design process, each worksheet asks questions about these key elements. Consequently, the designer has an opportunity to gather information, check it, and correct it several times throughout the design process. This enables instructional designers to be confident that they have remained focused on valuable accomplishments.

The purpose of the present study was to determine to what extent the job aid developed by Brethower controlled instructional designers' behavior so that they effectively and efficiently produced performance-based learning programs. Because the four worksheets had been extracted from a larger program, it was necessary to conduct this study as a research and development project: a description of each worksheet, the criteria for evaluation of each completed worksheet, and a program design evaluation was developed and tested. In addition, the time it took to develop a program was recorded. Finally, a questionnaire was administered to determine whether participants of the study said they found the job aid useful.
CHAPTER II

METHOD

Setting

This study was conducted in the Human Resources Development Department of a medium-sized privately held direct selling company in the Midwest. The department was responsible for the training and development of approximately 4200 employees. The training programs that the department had been asked to design ranged from technical (statistical process control, personal computer usage, marketing) to management development (selection interviewing, performance appraisal, conflict management). When the study was implemented, no systematic approach to instructional design was used by the department. Each instructional designer used methods and techniques that gained him/her the quality and quantity needed to meet clients’ and/or end-users’ expectations.

Subjects

Two members of a Human Resources Development Department staff agreed to participate in the study. One had a Ph.D. in English and had been developing and delivering learning programs for twenty years. He had specialized in instructor-led computer courses for ten years and had also designed some courses that used computer-aided instruction. The second participant had an Industrial/Organizational Psychology master’s degree and had designed only two learning programs. The programs he had designed were instructor-led and were in management development and statistical process control. Four contractors (designers who work for pay but are
not employees of the company) also agreed to participate in the study. Three had masters’ degrees in Industrial/Organizational Psychology. The fourth was working on her thesis for her Industrial/Organizational Psychology master’s degree. Each had previously designed and implemented only two or three learning programs. In addition, two individuals did not directly participate in this study but did contribute pre-intervention data. Both of these individuals (this investigator was one of them) had completed all course work for the Industrial/Organizational Psychology master’s degree. These individuals each had a minimum of ten years of experience in designing learning programs. This research was reviewed and approved by the Human Subjects Institutional Review Board and all participants signed informed consent forms prior to the study (see Appendix A).

Materials

A job aid, designed by the researcher, the Analysis-Design Instructional Guide, was the main instrument used throughout this study. It contained four worksheets (see Appendix B):

1. The Rapid Analysis Worksheet was used to collect general information about the project. It provided the designer with a quick overview and direction.

2. The Progress Planner Worksheet became the instructional designers “To Do” list. It required the identification of major project products, key tasks to produce these products, completion dates, and costs (estimated and actual).

3. The Mastery Performance Worksheet was used to identify the accomplishments/outputs produced by an exemplary performer as well as the critical systems elements necessary to do the job.
4. The last worksheet, the Lesson Production Worksheet, was a tool that helped ensure that all necessary educational components (e.g. inductive, domain, guided practice, etc.) were included in the design of a program/lesson.

Version I of the Analysis-Design Instructional Guide (Guide) consisted of the four original worksheets designed by Brethower (1968). Initially no changes were made to these. This author designed an overview about why it was important to use the job aid, directions on how to use it, brief introductions to each worksheet, and criteria checklists for each worksheet. These were packaged together with the worksheets. It was given to one instructional designer to use. He was instructed to record his questions, concerns, and/or comments on an audio cassette; in addition, he was asked to grapple with the materials to see if he could find the answers within the process before coming to the author with questions. The feedback (see Appendix C) from this instructional designer was used to create version II. Examples of feedback were: (a) “I don't know how to use the checklists with both a 'yes' and a 'no' written on them”; (b) “I don't understand how to use the Progress Plotter Tasks Worksheet. The last paragraph about the Progress Plotter is unclear. I'm confused!”; and (c) “On the Lesson Production Worksheet—I'm not sure I see the distinction between follow-up records and follow-up support.”

This author used the recorded feedback to make specific changes to the job aid. Examples are:

1. The places for checking “no” on the criterion checklists were removed; only a place for checking “yes” was retained.

2. For the Rapid Analysis: Cycle 1 Worksheet, Cycle 1 was dropped from the title. Question 1 of that worksheet was originally written “Logistics: A one or two paragraph answer to ‘What are the constraints on what I do?’” It was revised to read...
"Describe in one or two paragraphs the constraints that you, the designer, will encounter while working on this program."

3. The Progress Plotter: Tasks Worksheet was renamed Progress Planner Worksheet and an expanded description was written for the introduction to the worksheet. In addition, a completed example of the worksheet was included.

4. A list defining each of the educational components was added to the Lesson Production section. This was done to see if the definitions alone added information that better enabled the instructional designers to complete the worksheet. Only areas in the Guide that caused confusion, questions or comments from the instructional designer were revised. No other enhancements were made. In addition, no other specialized instruments or equipment were used in this study.

Dependent Variables and Raters

Four variables were recorded for this study: (1) trained independent raters used criteria checklists to evaluate the written content of each completed worksheet, (2) the raters also used a criterion checklist to evaluate each completed learning module, (3) the amount of time it took to design a module was recorded, and (4) the instructional designers answered a questionnaire rating the usefulness of the Guide. Each variable will be reviewed in detail below.

The first dependent variable in this study was the percentage of criteria met for each completed worksheet. Raters were asked to compare completed designer's worksheets against the criteria (see Appendix D) for that worksheet. They checked "yes" if a criterion was met. After all the criteria on a checklist were checked, the total number of points earned was computed to determine the percentage of criteria met on that worksheet.
The second dependent variable was the percentage of criteria met for the Program Design Evaluation. The raters evaluated the final learning module by checking "yes" if a criterion (see Appendix E) on the evaluation was met. The percentage of criteria met was computed the same as above.

The third dependent variable was the number of hours it took to produce a learning module. The instructional designers tracked their time by task. The time for all tasks were added for a total number of hours per module (Head, 1985).

Instructional designer ratings were the fourth dependent variable. After completing the design of a second learning module, each designer answered a questionnaire (see Appendix F) about the value of using the Guide. The rating for each question was computed by calculating the mean of all designer responses for that question.

The raters were five students working on their master’s degrees in Industrial/Organizational Psychology. Three had completed their course work; two had one remaining course to take. During training as raters they were given a job aid (see Appendix G) that described the process they were to use to evaluate each completed worksheet. Each person read the job aid and asked questions about information that was unclear. After all questions were answered, each person was given completed worksheets for the same learning program and the criteria checklists for rating the worksheets. They were asked to independently and privately complete the criteria checklists during the next week. During subsequent training meetings this investigator acted as an observer while the raters, in pairs, compared their separate sets of criterion checklists. Every criterion marked the same was counted as an agreement. Those criteria marked differently were counted as disagreements. Interrater agreement was assessed using the point-by-point agreement method (Kazdin, 1982). The number of
agreements were divided by the number of agreements plus disagreements and multiplied by 100 to obtain a percentage of overall agreement. This initial percentage of agreement was identified as the “before discussion” score.

Next the raters discussed the items marked as disagreements. Each person described his/her rationale for rating the criterion. If a consensus could be reached about the criterion, it was marked accordingly and scored as an agreement. However, if a consensus could not be reached, that item remained a disagreement. Once again the interrater agreement was calculated to obtain a percentage of agreement. This percentage of agreement was identified as the “after discussion” score. The investigator did not participate in the discussion. This concluded the interrater training.

There were no specifically designed immediate short-term contingencies available to the raters that might have affected their recording accuracy. However, there may have been some long-term consequences, in that several have asked to use the Guide within their organizations when it is completed.
Procedure

Initially the Guide consisted of four worksheets. It was given to an instructional
designer to use to design one module of a program. He was asked to record on an
audio cassette any questions, concerns, and/or comments he had while using the
worksheets. The instructional designer's feedback (see Appendix C) was then used to
create version II of the job aid.

During a 10-minute meeting, version II of the Guide was introduced to six
instructional designers individually. Included with the job aid was a written rationale
and instructions. Designers were asked to read both and then browse through the job
aid. If the individual asked questions during the meeting, the answers were given in
general terms by repeating the written instructions or by pointing to the part(s) of the
job aid that most closely related to the questions. The designers were encouraged to try
using the job aid to see if they could find answers to their questions in the process of
using it. In addition, each instructional designer was asked to record on an audio
cassette questions, concerns and/or comments about the job aid; the instructional
designer was also told that the information could be written as long as it was complete
and clear. The instructional designers were told that their feedback would be used to
revise the Guide.

The third set of revisions were made to the Guide after four designers had each
used it to design one module of a program. Again, only areas that caused confusion,
questions or comments from the instructional designers were revised. Often the same
complaint was stated by more than one designer. In addition, the comments made by
the instructional designer who had no previous Industrial/Organizational Psychology
background were given more weight. His concerns would most realistically reflect the
majority of the instructional designers in the world. Examples are:
1. The specific business explanation of why we would use the job aid was removed and a new generic one was written. It also included a graphic.

2. Headers were added to clearly identify specific sections of the job aid; page numbers were added; and appendices with extra worksheets and criterion checklists were added. The job aid could remain as a whole, yet allow the designers to use the parts they needed.

3. The Progress Planner Worksheet was clearly identified as a “To Do” list. Because the old instructions on how to use the Progress Planner were still unclear, new ones were written in a job aid format. The example was titled—Example—and it was handwritten instead of computer generated. This was done because designers talked about how time consuming it was to format the Progress Planner on the computer.

4. Three examples of completed Lesson Production Worksheets were added. The definitions on the educational components included in Version II had been helpful but examples were specifically requested by the non-Industrial/Organizational Psychology designer.

After version III of the Guide was completed, the six instructional designers received it and a letter (see Appendix H) describing changes made for this iteration of the job aid. The designers were asked to use the revised edition to design a second module of a learning program. Once again they were asked to record on audio cassette or to write their questions, concerns, and comments as they used the job aid. They were told that this information may be used to produce a fourth version. If the instructional designers asked the investigator questions about the job aid while using it, the investigator once again gave the answers in general terms or pointed to the appropriate part(s) of the job aid.
Four of the six designers completed a learning module using version III of the Guide. One designer did not have a project that required the design of a learning module and the second designer was working on a project that could not be completed prior to the conclusion of this study.

The individuals in the study were not given any information about the rating procedures and who was rating the worksheets; nor were individuals given information about the data collected. The designers were also asked not to discuss the job aid with their coworkers. In addition, it was made clear in the informed consent form (see Appendix A) that the study and the conditions surrounding it were not going to be used to evaluate their performance.

As a learning module was completed, the worksheets and/or the learning module and the criterion checklists were sent to two raters by the investigator (see Appendix I). The raters were to independently and confidentially complete the checklists. Once that was done, they were to telephone each other and compare their responses to obtain “before discussion” and “after discussion” scores. All materials were then returned to the investigator for recording (see Appendix I).

The data from version II and version III were compared to pre-intervention data. The pre-intervention data were collected on four learning programs using only the Lesson Production Criteria Checklist and the Program Design Evaluation (see Appendices C & D). Since these programs had been designed two to four years prior to this study, the procedures relevant to the other worksheets were not available for evaluation. Data were also not available on the length of time to produce these programs. Two of the programs were designed by one of the designers participating in the study, one was designed by this author, and the fourth program was designed by a person who no longer works for the organization.
Experimental Design

This study was primarily a research and development one conducted within the constraints of a business system. The objective was to develop and validate an instructional-design job aid. Revisions were made from the audio recorded feedback and written feedback collected from the instructional designers. Thus, this study compared two different values of the independent variable. In some ways this study resembles an AB experimental design since it was a series of independent AB replications across two major iterations. Although an AB experimental design is rather weak, a series of independent AB replications significantly strengthens the demonstration of control (Barlow & Hersen, 1984). In this case there were four independent replications comparing version II and version III.

In addition, a comparison was made between pre-intervention data (programs developed prior to the Guide's development) and the data collected from the use of version II and version III of the Guide. In this case the comparison was across individuals because the pre-intervention data did not necessarily come from the participants of this study. (One person did design learning modules for this study as well as two modules of the pre-intervention data, but his data were not analyzed separately.)
CHAPTER III

RESULTS

The main purpose of this research and development study was to produce a job aid that enabled instructional designers to design performance-based instruction. In the process of developing the job aid an attempt was made to answer several questions.

A major question asked in this study was, “Will the designers meet the general design criteria for performance-based instruction?” Performance-based instruction requires the learner produce a tangible product at the conclusion of the learning that approximates one that is needed in the learner’s environment (Gilbert, 1978). The percentage of criteria met on the Program Design Evaluation was used to answer this question. These criteria stressed looking for a product and/or subproducts produced by the learner throughout the learning program. Table 1 shows the percentage met for 5 Program Design Evaluation criteria for each version.

The percentage of criteria met under each version represents one learning program. Each learning program produced by persons who used Version III met 60% or more of the criteria. Person C was asked by the manager, this investigator, to resubmitt the module designed using version III. The designer obtained 100% on the resubmission. For 3 out of the 4 designers who used both versions, their percentage of criteria met increased from version II to version III; the fourth achieved 80% with both versions. Three of the 6 achieved 80% using version II.
Table 1

Percentage of Criteria Met for Program Design Evaluation

<table>
<thead>
<tr>
<th></th>
<th>Version II</th>
<th>Version III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person A</td>
<td>80%</td>
<td>100%</td>
</tr>
<tr>
<td>Person B</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td>Person C</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>Person D</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Person E</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Person F</td>
<td>80%</td>
<td></td>
</tr>
</tbody>
</table>

of the 5 criteria. One criterion was, "Is the learner required to produce a tangible product at the end of each course/lesson?" In four out of six cases of version II, the raters were able to identify a product. In three out of four cases for version III, the raters were able to identify a product. The second criterion was, "Does the sequence of learning subproducts lead to a major product?" In two out of six cases for version II, the raters were able to identify subproducts that led to a major product; whereas, in three out of four cases for version III, the raters were able to identify subproducts that led to a major product. The instructional designers were able to meet the general design criteria for performance-based instruction when using the Guide.

In order to determine to what extent the Guide enabled designers to produce performance-based instruction, pre-intervention data were collected on four programs that were completed without the use of the Guide. They were also completed before there were any plans for this study. Programs 3 and 4 were
produced by Person C of this study; program 2 was produced by a designer who no longer works for the organization; and program 1 was produced by this investigator. Table 2 shows the percentage of criteria met for the Program Design Evaluation.

Table 2

Percentage of Criteria Met for Program Design Evaluation of the Pre-intervention Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Design Eval.</td>
<td>80%</td>
<td>20%</td>
<td>40%</td>
<td>20%</td>
<td>30%</td>
</tr>
</tbody>
</table>

None of the four pre-intervention programs achieved a score higher than the median (90%) for all programs designed using version III of the Guide; however, program 1 achieved 80% of the criteria. This was higher than the median (70%) for those programs designed using version II of the Guide. This person had attended the Programmed Instruction Workshop from the University of Michigan, a companion workshop to the one from which the worksheets in the Guide were taken.

A second question the study attempted to answer was “Was development time reduced?” Table 3 shows the number of hours it took the instructional designers to develop their programs.
Table 3

Hours Per Module of Development Time

<table>
<thead>
<tr>
<th>Person</th>
<th>Version II</th>
<th>Version III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person A</td>
<td>68</td>
<td>30</td>
</tr>
<tr>
<td>Person B</td>
<td>71</td>
<td>137</td>
</tr>
<tr>
<td>Person C</td>
<td>202</td>
<td>125</td>
</tr>
<tr>
<td>Person D</td>
<td>41</td>
<td>37</td>
</tr>
<tr>
<td>Person E</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Person F</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

These data were all self-reported. There was no reliability check conducted on them. There were no pre-intervention data available for this variable. However, it is possible to compare development times for the modules in this study against industry norms. The industry provides development time ratios by delivery medium (programmed instruction, instructor-led instruction, computer-based training and video) (Lee & Zemke, 1987). Industry norms suggest that it will take 100 hours of development time to produce one hour of programmed instruction; and it will take 40-50 hours of development time to produce one hour of instructor-led instruction. In this study, all learning modules were designed for two hours of instruction. In addition, all modules were programmed instruction except for Person A’s version III module. It was instructor led. Thus, using industry standards, the expected development time for the programmed instruction would have been 200 hours per module and 80-100 hours for the instructor-led instruction. The module that took 202 hours to develop was very technical and required extracting the information...
from a subject-matter expert. Information for designing this program was not available from written documentation. If the instructor-led and programmed-instruction ratios are used for a comparison, all but one designer took fewer hours to develop the learning modules than the industry norms.

The third question the study asked was, "To what extent do the worksheets in each version of the Guide control instructional designers' behavior?" In other words, would designers complete all, some, or none of the worksheets without added contingencies for work completed? Would the designers complete the worksheets adequately, as measured by pre-set criteria? Examples of criteria to be met are: (a) mastery performance is described in terms of a product or a service, (b) there is a description about what part of the performance is not working, (c) completion dates are listed, (d) standards for the quantity of the product are described, and (e) exercises are provided that enable the learner to practice the producing a product or using new processes. Each designers' completed worksheets were compared to the criteria. Table 4 shows the percentage of criteria met by each designer when using version II and version III of the Guide and Table 5 shows the percentage of criteria met for the baseline programs.

The median percentage of all worksheet criteria met by the designers for versions II of the Guide was 83.75%. The median percentage of all criteria met for version III was 75%. The median percentage of criteria met for the Lesson Production worksheet for version II was 75%. The median percentage of criteria met for version III was 80%. Both of these medians were higher than the median of 10% for pre-intervention programs. The highest median for these latter programs (60%) was surpassed by 6 of the 10 programs produced using version II and
Table 4
Percentage of Criteria Met for Version II and Version III

<table>
<thead>
<tr>
<th></th>
<th>RA</th>
<th>PP</th>
<th>MP</th>
<th>LP</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>version II</td>
<td>90%</td>
<td>80%</td>
<td>100%</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>version III</td>
<td>90%</td>
<td>80%</td>
<td>75%</td>
<td>95%</td>
<td>85%</td>
</tr>
<tr>
<td>Person B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>version II</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>version III</td>
<td>70%</td>
<td>100%</td>
<td>75%</td>
<td>90%</td>
<td>82.5%</td>
</tr>
<tr>
<td>Person C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>version II</td>
<td>90%</td>
<td>60%</td>
<td>100%</td>
<td>30%</td>
<td>75%</td>
</tr>
<tr>
<td>version III</td>
<td>70%</td>
<td>100%</td>
<td>62.5%</td>
<td>50%</td>
<td>66.25%</td>
</tr>
<tr>
<td>Person D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>version II</td>
<td>100%</td>
<td>100%</td>
<td>87.5%</td>
<td>70%</td>
<td>93.75%</td>
</tr>
<tr>
<td>version III</td>
<td>90%</td>
<td>100%</td>
<td>100%</td>
<td>50%</td>
<td>95%</td>
</tr>
<tr>
<td>Person E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>version II</td>
<td>30%</td>
<td>40%</td>
<td>37.5%</td>
<td>80%</td>
<td>38.75%</td>
</tr>
<tr>
<td>Person F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>version II</td>
<td>70%</td>
<td>60%</td>
<td>62.5%</td>
<td>90%</td>
<td>66.25%</td>
</tr>
</tbody>
</table>

Note. The above abbreviations represent the following worksheets:
RA—Rapid Analysis
MP—Mastery Performance
PP—Progress Planner
LP—Lesson Production

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Table 5

Percentage of Criteria Met for Lesson Production Worksheet of the Pre-intervention Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Production</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

version III of the Guide. There was, however, considerable variability. Across version both versions the designers' varied from 30% to 100%. The worksheets do not completely control instructional designers' behavior and required management support. For example, this investigator asked person C to redesign the Lesson Production Worksheet after the first writing and resubmit it. Person C attained 60% of criteria met when the worksheet was resubmitted.

To determine the reliability of the interrater agreement every criterion on the checklists was used. Initially, the criteria on the checklists were independently and confidentially scored by trained raters. Next, the raters, who were assigned the same learning program, compared responses to determine the number of criteria marked the same. The agreed upon criteria became the “before discussion” score. Raters agreed on 441 criteria out of 540 for an average reliability of 81.66%. After the raters had compared criteria they discussed those that were different for an “after discussion” score. The raters agreed on 530 criteria out of 540 for an average reliability of 98.15%.
The last question the study asked was, "How useful was the Guide to the instructional designers?" The four instructional designers who each used both versions were asked to answer a Usefulness Questionnaire. Five questions on the questionnaire helped answer that question. Table 6 shows the questions and the median response for each.

Table 6

Usefulness of the Analysis-Design Instructional Guide

<table>
<thead>
<tr>
<th>Question</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Did you find the Analysis-Design Instructional Guide helped your instructional design process?</td>
<td>3.5</td>
</tr>
<tr>
<td>2. Did the job aid help you produce a product faster?</td>
<td>3.25</td>
</tr>
<tr>
<td>3. Did it help you produce a better final product?</td>
<td>4.5</td>
</tr>
<tr>
<td>4. Do you think other instructional designers would find it useful?</td>
<td>4.5</td>
</tr>
<tr>
<td>5. Would you recommend the Analysis-Design Instructional Guide to other designers?</td>
<td>5</td>
</tr>
</tbody>
</table>

These data suggest that the designers thought the Guide was of some help to themselves but that they also thought that it would be more helpful to others.
CHAPTER IV

DISCUSSION

Instructional designers who used the Guide(s) were able to meet a higher percentage of general criteria for performance-based learning programs than designers who did not. In addition, they took less time to develop programs than industry norms suggest. Even though the behavior of the designers was not completely controlled by the worksheets, all the worksheets were used to some degree. Finally, the designers who used both Guides found it somewhat useful for themselves and thought it could be even more helpful to others.

The worksheets developed by Brethower (1968) were the core of the Guides. In the worksheets Brethower, like Gilbert and Gilbert (1989) and Harless (1988), focuses on “worthy accomplishments” or products produced by the exemplary performer. Brethower’s worksheets also concentrate on gathering “real-world” environmental information surrounding the production of the product. This review of “worthy performance” is done in cycles. For example, the Rapid Analysis Worksheet is used to gather information from a management or administrative view point and the Mastery Performance Worksheet is used to gather the same information in more detail from one or more exemplary performers. The Lesson Production Worksheet is then used to design the program for learners. The educational components on this worksheet utilize both the product and environmental information. This cycling process at several levels helps keep designers focused on the product and its environmental conditions. In addition, the
Guides reduce or minimize the negative effects of “forgetting” (Bullock, 1982) and help ensure the development of performance-based instruction.

Since the Guide enabled the designers to produce their learning programs in less time than industry norms (Lee & Zemke, 1987), substantial savings accrued to the organization. The Guide also might prevent the cost of formally training people in how to become designers.

The percentage of criteria met on the Program Design Evaluation suggests that both versions of the job aid enabled designers to produce performance-based instruction. The data suggest that version III enabled this to occur better than version II. Three out of four designers increased their percentage of criteria met for both the Lesson Production Worksheet and the Program Design Evaluation while using version III. One reason for this may have been the addition of examples to the Guide. During individual testing of the version I Guide, it was recommended that an example of a completed Progress Planner Worksheet be added to the job aid. Otherwise, this Worksheet would remain confusing. This was done. At the conclusion of using version II of the Guide, the investigator was emphatically told to add examples to the Lesson Production unit for version III. This was done.

The power of using an example can be further illustrated. Person A's 85% of criteria met for version II and Person F's 90% of criteria met for version II were not an accurate test of the Lesson Production Worksheet. Version II of the Guide did not contain an example of a completed Lesson Production Worksheet. During the study, Persons A and F, inadvertently, received an example of a completed Lesson Production Worksheet. These individuals used that example as a model to facilitate their use of the worksheet. As a matter of fact, both designers stated that they were having difficulty using the worksheet until they found the example.
Persons B, C, and D show significant improvement in their use of the Lesson Production Worksheet from version II to version III. Their scores for version III corresponds closely with the scores received by A and F for version II. Version III of the Guide included an example of a completed Lesson Production Worksheet. Therefore, their improved performance may be attributed to seeing the examples of the Lesson Production Worksheets that were included in version III of the Guide.

This would seem to suggest that someone using version III would be more likely to produce performance-based instruction than from version II. On the other hand, several other variables may have caused the increase in percentage of criteria met. First, completing the developmental testing and implementing the module designed by using version II of the Guide could have taught the designers the importance of ensuring that the learners produced several subproducts and a final product during the learning. Second, how near the worksheets were to implementation may also have influenced the number of criteria met for both the Lesson Production Worksheet and the Program Design Evaluation. For example, because this was a research and development project some designers handed in the worksheets as soon as they finished using them. They knew their feedback on how the job aid was working was needed. On version III more development time was used. Some designers had “pilot tested” their worksheets with learners and were ready to implement the program. In this last situation, errors in design could have been corrected before the worksheets went to the raters. Consequently, this may have caused designers to attain a higher percentage of criteria met on version III. Third, the practice of using version II of the Guide may have caused the increase in percentage of criteria met on Version III. (Sequential confounding suggests that performance on version II might have been superior to performance
on version III, if the sequence had been reversed.) Finally, concurrent development of other instructional programs while using the job aid may also have caused the increase. Although the designers only had to use the Guide to design one program for each version of the Guide, some choose to use it for additional projects. This additional practice might have caused the increase in percentage of criteria met.

Although the worksheets did not completely control designers’ behavior, no worksheet was left undone. Every designer completed enough of a worksheet to attain a minimum score of 30% of criteria met. For example, one participant had had no previous experience with performance-based instruction. This person did not understand what was required on the Lesson Production Worksheet. As the person tried to complete the worksheet, intense frustration occurred. In spite of that, the individual met 30% of the criteria and was willing to continue in the study using version III of the Guide.

In general, those instructional designers, who had completed their Industrial/Organizational Psychology master's degree courses and had exposure to performance-based instruction seemed to do better. The percentage of criteria met per worksheet for these designers ranged from 60% to 100%. There was one exception. This individual explained that all questions from each worksheet were answered within his/her head. This individual also stated that the information from the first three worksheets was integrated into the written content on the Lesson Production Worksheet as was evident by the 80% of criteria met for that worksheet.

Other factors may have played a part in the variability of the percentage of criteria met for each worksheet and the Program Design Evaluation. One possible factor may have been the lack of sufficient training for the raters. The raters had
completed their course work for the Industrial/Organizational Psychology master's degree and had been trained in how to use the criteria checklists. However, they had not had experience in applying the criteria checklists to a wide array of examples. Another factor may have been the design of the checklists. The checklists asked the raters to check “yes” if the information was written on the worksheet. If a designer wrote “information not available”, the raters did not give the designer credit for that criterion. This may have reduced the number of criteria met for that worksheet.

No specific contingencies for completing the worksheets were planned for this study. However, it is possible that several variables may have acted as contingencies. For example, one factor may have been the opportunity to produce a module in a project. Since this was a major organizational project, these modules had high visibility. In addition, the designers whose modules were successful, were more likely to have the opportunity to do more modules. There may have been a second contingency controlling the designers’ behavior. It was the desire to be part of a special group. Because of time constraints within the organization, one designer was asked if s/he wanted to continue in the study; the response was “I don't want to be left out.” A third contingency may have involved the desire for approval from this investigator who was also the manager of these projects. This investigator had also recommended these designers for projects within other organizations.

If the job aid is going to succeed with persons who have no applied behavior analysis background, careful development of the job aid must occur. In other words, the developer can not assume that instructional design terms will be understood. These terms must be defined and examples given. Otherwise, lay
persons will give up and return to non-performance-based instructional design techniques.

Although designers may have an applied behavioral analysis background and conceptually understand performance-based instruction, they may not automatically apply that understanding. For example, while using version III of the job aid, Person C in this study took Applied Behavior Analysis: A Systems Approach, a graduate course, and heard Tom Gilbert speak. In spite of this, the person did not understand that “valuable accomplishments” meant that learning was to be designed around a product the performers would naturally produce while doing their job. After seeing the first draft that Person C developed using version III of the job aid, a discussion was held to clarify what performance-based instruction meant and how that related to what Gilbert teaches. Examples facilitate the application but designing is still a difficult skill to learn. The educational model most people see is not performance based.

The Guide needs to be revised based on the feedback from version III. Examples of the feedback were: (a) “It is still unclear to me how to use question I of the Progress Planner,” (b) “Put more space between the bullet items in the description of the Lesson Production Worksheet,” and (c) “Label the examples in the Lesson Production Worksheet section as ‘Examples’ as you did in the Progress Planner Worksheet section.”

The Guide then needs to be tested in an environment where the job aid is unknown. There are several factors that need to be considered in testing a revised edition. They include the collection of baseline data, the use of non-Industrial/Organizational Psychology trained designers, and planned contingencies. If these factors become part of the research design, they may help determine the
effectiveness and efficiency of the Guide. In addition to the current formative evaluation, two types of summative evaluation data (Brinkerhoff, 1988; Carnevale & Schulz, 1990) need to be collected for programs designed using the job aid. They include recipient opinion and organizational impact. The data will determine the effectiveness of the job aid. They will also determine if the Analysis-Design Instructional Guide is a “worthy accomplishment.”
REFERENCES


Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.


APPENDICES
Appendix A

Human Subjects Institutional Review Board
Informed Consent Letters
Date: May 2, 1990

To: Karolyn A. Smalley

From: Mary Anne Bunda, Chair

This letter will serve as confirmation that your research protocol, "Analysis-Design Instructional Guide: A Job Aid Used by Instructional Designers to Design Learning Programs", has been approved as full by the HSIRB. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application.

You must seek reapproval for any change in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board wishes you success in the pursuit of your research goals.

cc: R. Melott, Psychology

HSIRB Project Number 90-03-10

Approval Termination May 2, 1991
INFORMED CONSENT FOR USE OF DATA IN KAROLYN SMALLEY'S
MASTERS THESIS

I, Karolyn Smalley, Manager of the Human Resources Development
Department at Amway Corporation and a student at Western Michigan
University, will be investigating the effectiveness and efficiency of
using a job aid to design performance-based learning programs. This
job aid is called the Analysis-Design Instructional Guide. It
contains four worksheets constructed to facilitate the analysis and
design phases of preparing a performance-based learning program.
It also contains instructions for each worksheet, a criterion
checklist for each worksheet, a Program Design Evaluation, and a
Time-on-Task recording sheet. You are to use this job aid as a
regular part of your work when designing learning programs.

Plan to design one module of a learning program using the
instructional design job aid and to ask questions or to make
comments on how well it works. After that module is designed, the
job aid will be revised based on your feedback. Then the revised
edition of the job aid will be given to you so that you can use it to
design a second module of a learning program. You will be asked to
participate in this iterative process a minimum of two times. As
you are aware, this iterative process is the standard procedure used
in validating instruction for this department.

There will be three sets of data collected and used within the
thesis. They are:
1) percentage of criteria met per worksheet. The criterion
checklist will be used to evaluate each worksheet completed and
from it the percentage of criteria met will be calculated for that
worksheet. If multiples of one worksheet are used, the mean for the
total will be calculated and used for that set of worksheets.
2) percentage of criteria met will be calculated for the
program using the Program Design Evaluation checklist.
3) a cost-effectiveness analysis will be calculated for each
program based on the time spent to design the program.

These data will be listed in graph and table form so that
comparisons may be made between the the first use of the job aid
and the revised edition of the job aid. In addition, these data will be
recorded so that people reading the thesis will not be able to
associate items of data with individuals.
Although using the instructional design job aid is required and not an option, you do have the option of releasing or not releasing your data for use within my thesis. If you should decide not to release your data to me, I will make every attempt not to lower your performance evaluations. However, if you still have concerns, please notice the attached letter from Dwight Sawyer, the Vice President of Human Resources, which states that your refusal to release your data cannot become part of your performance appraisal. Additional protection is offered through the formal performance appraisal appeal procedures. As you are aware, writing a rebuttal and/or not signing the performance appraisal and/or writing a rebuttal ensures review by the President, Rich DeVos, of Amway. This also provides protection for your current employment status.

As indicated earlier, your use of the job aid is required. However, releasing the data and allowing the investigator to use the data in all parts of her thesis is voluntary. Further, you may choose to withdraw the use of your data at any time without penalty by contacting Karolyn Smalley at 676-5202. If you agree that the investigator can use your data from your use of the job aid in her thesis, please sign the bottom of this form. Please keep the copy of this form that is attached. Thank you.

YOUR SIGNATURE BELOW INDICATES THAT YOU UNDERSTAND THE ABOVE INFORMATION AND HAVE VOLUNTARILY DECIDED THAT THE INVESTIGATOR CAN USE YOUR DATA IN HER THESIS.

(Please print your name.)

Your Signature  Date
April 20, 1990

Western Michigan University
Human Subjects Institution Review Board
Kalamazoo, MI 49001

To Whom It May Concern:

We are interested in designing and using new tools which increase productivity. Karolyn Smalley's instructional job aid has that potential. Employees who refuse to release their data will not find it reflected in their performance appraisals.

Sincerely,

Dwight W. Sawyer
Vice President
Human Resources

DWS:kash
INFORMED CONSENT FOR USE OF DATA IN KAROLYN SMALLEY'S
MASTERS THESIS

I, Karolyn Smalley, Manager of the Human Resources Development
Department at Amway Corporation, and a student at Western
Michigan University, will be investigating the effectiveness and
efficiency of using a job aid to design performance-based learning
programs. This job aid is called the Analysis-Design Instructional
Guide. It contains four worksheets constructed to facilitate the
analysis and design phases of preparing a performance-based
learning program. It also contains instructions for each worksheet,
a criterion checklist for each worksheet, a Program Design
Evaluation, and a Time-on-Task recording sheet. You are to use this
job aid as a regular part of your work when designing learning
programs.

Plan to design one module of a learning program using the
instructional design job aid and to ask questions or to make
comments on how well it works. After that module is designed, the
job aid will be revised based on your feedback. Then the revised
edition of the job aid will be given to you so that you can use it to
design a second module of a learning program. You will be asked to
participate in this iterative process a minimum of two times. As
you are aware, this iterative process is the standard procedure used
in validating instruction for this department.

There will be three sets of data collected and used within the
thesis. They are:

1) percentage of criteria met per worksheet. The criterion
checklist will be used to evaluate each worksheet completed and
from it the percentage of criteria met will be calculated for that
worksheet. If multiples of one worksheet are used, the mean for the
total will be calculated and used for that set of worksheets.

2) percentage of criteria met will be calculated for the
program using the Program Design Evaluation checklist.

3) a cost-effectiveness analysis will be calculated for each
program based on the time spent to design the program.

These data will be listed in graph and table form so that
comparisons may be made between the the first use of the job aid
and the revised edition of the job aid. In addition, these data will be
recorded so that people reading the thesis will not be able to associate items of data with individuals.

Although using the instructional design job aid is required and not an option, you do have the option of releasing or not releasing your data for use within my thesis. If you refuse to allow your data to be used in the thesis, I will make every effort to assure that it does not bias future work decisions.

As indicated earlier, your use of the job aid is required. However, releasing the data and allowing the investigator to use the data in all parts of her thesis is voluntary. Further, you may choose to withdraw the use of your data at any time without penalty by contacting Karolyn Smalley at 676-5202. If you agree that the investigator can use your data from your use of the job aid in her thesis, please sign the bottom of this form. Please keep the copy of this form that is attached. Thank you.

YOUR SIGNATURE BELOW INDICATES THAT YOU UNDERSTAND THE ABOVE INFORMATION AND HAVE VOLUNTARILY DECIDED THAT THE INVESTIGATOR CAN USE YOUR DATA IN HER THESIS.

__________________________________________
(Please print your name.)

__________________________________________
Your Signature                                      Date
Appendix B

Rapid Analysis Worksheet,
Progress Planner Worksheet,
Mastery Performance Worksheet, and
Lesson Production Worksheet
RAPID ANALYSIS WORKSHEET

1. Describe in one or two paragraphs the constraints that you, the designer, will encounter while working on this program.

2. In two or three sentences describe the mastery performance that the client wants in his/her performers to accomplish.

3. In two or three sentences describe how the performer's environment supports or encourages desired performance.

4. Describe the follow-up records that are used to determine if desired performance is maintained.

5. If performance is deficient, describe the parts of the performance that are not working as they should be.
6. List the performance strengths that the performer(s) currently has.

7. If a performance improvement program is provided, how will the performer gain mastery?

8. What progress records will be available to tell the learner and yourself that progress is being made?

9. What general content will be contained within the course?

10. What will the inductive include that will convince people that it would be worthwhile to attend?
PROGRESS PLANNER WORKSHEET

1. What are the components/task outputs and the task steps?

RAPID ANALYSIS

MASTERY PERFORMANCE WORKSHEET
LESSON PRODUCTION (COURSE)

2. Describe the steps needed to complete the component/task.

3. List the projected costs and timing targets.
MASTERY PERFORMANCE WORKSHEET

Name of Performer Interviewing _____________________

Use one worksheet for each major job accomplishment/output.

Accomplishment/output:
1. What does the master performer produce?

Inputs/raw materials:
2. What is transformed?

Processing System/tools:
3. What job aids, guides, personnel assistance, etc. are available while the performer is working?
Outputs and Process Feedback:
Quantity Standards
4. What are the requirements and goals?

Quality Standards
5. What are the requirements and goals?

Receiving System/receiver:
6. Who receives, handles, or uses the product external to the performer's department or organization?

Use and Value Feedback:
Evaluation
7. How are the performer's products evaluated by the receiver?

Evaluator
8. Who sees or uses the evaluative information from the receiver?
LESSON PRODUCTION WORKSHEET

1. Inductive:

2. Educative Processes:

   Domain - Generalization
   - Given -
   - Do

   Demonstration
   - Given -
   - Do -
Guided Practice

• Given -

• Do -

3. Demonstration of Mastery

4. Progress Records (or other device to enable student to see progress of the lesson):

5. Follow-up Records (to see if Mastery is maintained):

6. Follow-up Support
Appendix C

Unedited Examples of Feedback on the Guide
From the Instructional Designers
INFORMATION USED TO DESIGN VERSION II
of the
Analysis-Design Instructional Guide

Unedited feedback from one instructional designer on Version I.

Criterion Checklists

• I don't understand how to use the checklists with both a "yes" and a "no" written on them. Do I use both?
  • Are all of these criteria required or are they optional?

Rapid Analysis Worksheet

• Shouldn't I use the Rapid Analysis worksheet after I plan how to use it?
  • The criteria would led me to believe that there are only three kinds of lessons I can design. Am I to take that to mean any kind of learning activity or lesson could fit in any one of those three options?
  • Am not sure this is the best worksheet to take into an interview.
  • Some of the questions on the Rapid Analysis worksheet sound like they are supposed to be my analysis using my technology and the information gathered.
• Why is Rapid Analysis called Cycle 1.

Progress Plotter Worksheet

• I don't understand how to use the Progress Plotter--Tasks Worksheet. Here in the instructions for the tasks worksheet it says it works best if used right after the completion of a worksheet yet you tell me to start with the Rapid Analysis Worksheet.
• Last paragraph of the Progress Plotter instructions—not sure how that works. I'm confused. Apparently for each major worksheet I'm supposed to have tasks, task specifications, completion dates, etc. I'm not sure where the rough drafts, revisions, and final products fit into that. Are individual progress checks needed for each task?

Mastery Performance Worksheet

• Should I focus only on one output or try and get a couple?

• This is easier to do if I lay it out in a flow.

Progress Plotter: Lesson Production Worksheet

• I'm having trouble figuring this one out. Maybe it is the dual way of looking at it. It could either be a lesson or a course.

• How should you identify what lesson should be first?

• While filling out the lesson production worksheet I found myself having to go back to split things up even finer to get them into the domain, demonstration, and prompt. In my first attempt I put almost everything in Domain because it's split into "Given" and "Do". I'm wondering if the Domain is just the "Given and the Demonstration is the "Do". It is a little awkward to work through.

• In working on the Lesson Production Worksheet, I'm finding it difficult to write the educative processes without a specific method of instruction identified. The problem comes with the given and o. Under given we're asked to provide what the learner will have available so they can take some action. The "Do" us the action the learner is to take using what was given. I've found myself building everything into the first section, domain/generalization. Now I'm realizing I have to do the demonstration and prompt. I'm not sure the separation is useful.
• Awfully difficult to deal with mastery task. It is hard to know whether that is referring to exercise you just outlined or if there is supposed to be something new outlined here.

• I found it more helpful to consider, under Educative Processes, demonstration and prompt together; and maybe the mastery task as well, especially if you want the training to be performance based.

• I'm not sure I see the distinction between follow-up records and follow-up support.

• I've noticed that once I go through the Mastery Performance Worksheet outputs and process feedback, when I get to evaluation it's almost the same thing. Maybe that is a check to make sure it's the same.

INFORMATION USED TO DESIGN VERSION III

of the

Analysis-Design Instructional Guide

Unedited feedback from four instructional designers on Version II.

General

• I don't know if this is supposed to happen or not, but my experience has been that by the time I get into lesson production I discontinue recycling in the worksheets but begin to recycle in the actual project material.

• Does this cover: 1) How to decide if ever need training? 2) What if training is not the answer?

• Criterion checklist directions are more helpful.

• Page numbers would greatly help me keep organized.

• Where was it decided that training is the solution? or is this, especial the Rapid Analysis, the overall needs assessment.
• I don't record on an audio cassette easily; prefer writing notes.

• This listing doesn't make much sense to me at this point. Why not list the type of worksheets and page numbers, then describe later.

• As an outsider this description does not mean anything.

• There ought to be page numbers.

• I wouldn't put the information on the company and instructional design process within the job aid; it has nothing to do with the job aid itself and would not fit a broader market. They interrupt the flow of the job aid.

• A graphic would help give an overview better than all these written words.

• To a new user, the checklists would be the most useful. No matter how experienced you are as a developer, it is good to have to see that everything in a program is covered. The checklists are generally clear and straightforward and help make sure the developer has not forgotten anything or if he has act as a reminder to go back and fix it.

Rapid Analysis Worksheet

• Do I design the whole program or individual learning pieces?

• This has been a hindrance from my first experience with this job aid. Project indicates the whole program not a specific part.

• Titling and identifying documents: The next three documents are identified Rapid Analysis Worksheet, Rapid Analysis Checklist and Rapid Analysis Worksheet. These are not properly titled. Only the second is the actual worksheet. The first should be captioned "Using the Rapid Analysis Worksheet". Samples should be identified as such. When everything has the same name, you assume they are the same document.
• I'm not sure why there is a Rapid Analysis Checklist. It seems like the Rapid Analysis Worksheet can serve as its own checklist. The only reason to have a checklist is for someone like a supervisor to check up on the work of the worker. That would be handy to evaluate that way.

Progress Planner Worksheet

• Is this an example?
• Are these initial ideas about what we'll have to be done to complete the project?
• Are these ways to convey the mastery performance information gathered or simply an extension of the initial plans from the Rapid Analysis?
• Still confusing as to how this is used?
• Second paragraph confusing on first read. Big picture versus small details?
• Example?
• I'm lost! What is the purpose of this section?
• I see the time-on-task as the check on whether your action plan is being followed—however, I think it's been easy for me to write the plan and record my actual on my calendar. Perhaps making a spare on the progress planner for actual versus projected would be useful?
• These directions are very confusing. Put the worksheets in a list or make a diagram to show the flow of documents.
• Keep how to use the worksheets to a single page.
• If these are samples, what are they samples of and how do they fit together.

To me it is a mystery.
• Where it is possible, get rid of the jargon. It is OK for technical people but not for those who are just learning.

• The Progress Planner would be a lot more usable and user friendly if just a brief explanation were put on the sheet as a guide.

**Mastery Performance Worksheet**

• I like how this section is sequenced. Refer to my earlier remarks about titling and identifying documents.

**Lesson Production Worksheet**

• Still find this difficult to work with; for some reason my mind wants to reject the separate "Givens" and "Dos" for each Educational Process. I find the checklist much more helpful. The worksheet is restrictive but the checklists are not.

• Because this was the third module I didn't complete this section: You can review the actual module to assess whether I met these criteria (I did do the checklist).

• It would be nice if pages 20 and 21 could fit onto one piece of paper because it is a handy little guide.

• Probably the most difficult worksheet to cope with is the Lesson Production Worksheet; at least the first page; the second page is no problem. The first one loses me entirely! There is this list called key components of good instructional units. It is clear. There is no problem following it. For the life of me I can not translate that stuff into what I am supposed to do on page 22. I guess part of my frustration here is in contrast to the relatively easy time I had with the Program Action Plan. The Program Action Plan is close to the actual work. It is necessary for planning, less conceptual. One reason it is easy to do is not because of intrinsic nature but it was an example and
given an example I can pretty well imitate whatever it is. But without an example of the Lesson Production Worksheet I am totally lost.

Time-on-Task Worksheet

- Why is this here. It was not accounted for earlier in the program where all the other worksheets were named.
Appendix D

Rapid Analysis Checklist,
Progress Planner Checklist,
Mastery Performance Checklist, and
Lesson Production Checklist
RAPID ANALYSIS CHECKLIST

Somewhere in the Rapids Analysis Worksheet you should describe the following areas. Place a *checkmark* in front of each question that can be answered with a "Yes".

___ 1. Are constraints on the designer listed?

___ 2. Is mastery performance described as a product or a service?

___ 3. Is environmental support for the performance described?

___ 4. Are follow-up records described so that performance can be maintained?

___ 5. Is there a description about what part of the performance is not working?

___ 6. Is there a description about the strengths of the learner?

___ 7. Is there a description about how the performer will gain mastery?

___ 8. Are progress records identified?

___ 9. Is the general learning content described?

___ 10. Are long-term and short-term benefits to the learner described?
PROGRESS PLANNER CHECKLIST

Somewhere in the Progress Planner Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

_____ 1. Are products from a task described?

_____ 2. Are steps for each task listed?

_____ 3. Has the Progress Planner been converted to a Program Action Plan?

_____ 4. Are completion dates listed?

_____ 5. Are costs listed for each product?
MASTERY PERFORMANCE CHECKLIST

Somewhere in the Mastery Performance Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

1. Is a tangible product listed?
2. Are inputs or raw materials that can be transformed into the major product described?
3. Are examples, job aids, and/or people available for assistance, while performance is occurring, described?
4. Are standards for the quantity of the product described?
5. Are standards for the quality of the product described?
6. Is a receiver external to the producer(s) of the product listed?
7. Is there a description for product evaluation by the receiver?
8. Is there a listing of the person(s) who receives the evaluation?
LESSON PRODUCTION CHECKLIST

Somewhere in the Lesson Production Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

1. Is the question "why is this important to the attendees?" answered?

2. Is the general content, concept(s) or main theme of the course/lesson described?

3. Is there a demonstration of "how" the task or processes works?

4. Are there examples and non-examples for discrimination learning in the "given" of the Educative Processes?

5. Are exercises provided that enable the learner to practice the new concept(s), product, or processes?

6. Is immediate feedback available?

7. Is mastery performance described as a product or service with its corresponding standards?

8. Is there a plan or progress record that tells the learner how s/he is advancing through the lesson?

9. Are there follow-up records in the learner's environment that show him/her how s/he is doing in using what was learned?

10. Is follow-up support from the learner's environment listed?
Appendix E

Program Design Evaluation
PROGRAM DESIGN EVALUATION

Place a checkmark in front of each question that can be answered with a "Yes".

1. Is the whole presented before the parts?
2. Is the learner required to produce a tangible product at the end of each course/lesson?
3. Does the sequence of learning subproducts lead to a major product?
4. Are tools and resources listed for each step of the course/lesson?
5. Is feedback available at each step of the course/lesson?
6. Is there a course/lesson progress plan including dates and times for each learner?
7. Is there a course evaluation tool for the learner?
8. Is there a plan for the administration of the course?
Appendix F

Instructional Designer Questionnaire
INSTRUCTIONAL DESIGNER QUESTIONNAIRE

for the Analysis-Design Instructional Guide

1. Did you find the Analysis-Design Instructional Guide helped your instructional design process?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Not Helpful</td>
<td></td>
<td></td>
<td></td>
<td>Very Helpful</td>
</tr>
</tbody>
</table>

2. Did the job aid help you produce a product faster?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Not Fast</td>
<td></td>
<td></td>
<td></td>
<td>Very Fast</td>
</tr>
</tbody>
</table>

3. Did it help you produce a better final product?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Not Better</td>
<td></td>
<td></td>
<td></td>
<td>Much Better</td>
</tr>
</tbody>
</table>

4. Do you think other instructional designers would find it useful?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Not Useful</td>
<td></td>
<td></td>
<td></td>
<td>Very Useful</td>
</tr>
</tbody>
</table>

5. Would you recommend the Analysis-Design Instructional Guide to other designers?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Rarely</td>
<td></td>
<td></td>
<td></td>
<td>Always</td>
</tr>
</tbody>
</table>
Appendix G

Raters Instructional Job Aid, 
Cover Memo with First Program to Evaluate, and  
Clarification Memo
Please complete the following exercise in pairs.

<table>
<thead>
<tr>
<th>Plan to:</th>
<th>And if:</th>
<th>Then:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check each of your Rapid Analysis Checklists by comparing your responses for each criterion</td>
<td>They match</td>
<td>Count that criterion as one agreement.</td>
</tr>
<tr>
<td>Compare each consecutive criterion on the Rapid Analysis Checklist</td>
<td>They match</td>
<td>Count them as agreements.</td>
</tr>
<tr>
<td>Look for different responses to the same criterion</td>
<td></td>
<td>Identify that as a disagreement.</td>
</tr>
<tr>
<td>Discuss the difference</td>
<td>You can agree as to what the response should be</td>
<td>Mark the criterion so that both of your Checklists match &amp; count that as an agreement.</td>
</tr>
<tr>
<td></td>
<td>You can not agree as to what the response should be</td>
<td>Leave your Checklists as you originally marked them &amp; count that as a disagreement.</td>
</tr>
<tr>
<td>Calculate the Point-by-Point Agreement * for the Rapids Analysis Checklist</td>
<td></td>
<td>Write the percentage of agreement at the bottom of both of your Rapid Analysis Checklists.</td>
</tr>
</tbody>
</table>

* The formula for computing point-by-point agreement is:

\[
\text{Agreements} \times \frac{100}{\text{Agreements} + \text{Disagreements}}
\]
As you continue through the process,

<table>
<thead>
<tr>
<th>Plan to:</th>
<th>And if:</th>
<th>Then:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compare your responses for each criterion on the Progress Planner Checklist</td>
<td></td>
<td>Repeat the same process as above &amp; complete the Mastery Performance Checklist(s) &amp; the Lesson Production Checklist(s).</td>
</tr>
<tr>
<td>Compare your responses for the Program Design Evaluation</td>
<td></td>
<td>Repeat the same process as above for it.</td>
</tr>
</tbody>
</table>

THANK YOU for your support and help with this process. You are significantly helping to move my thesis along!!!
Enclosed is a learning program that was produced by one of the instructional designers who works for me. This person used the Analysis-Design Instructional Guide worksheets throughout the design process. Please use the Criterion Checklists to evaluate whether the program contains the necessary content just as you did with the practice program.

The key GRAPH, that I will be producing for the interobserver agreement, centers around the following two questions:

- How many criteria did the two observers agree upon prior to their discussion? and
- How many criteria did the two observers agree upon after their discussion?

I will also be producing a CHART that tracks agreement and disagreement for each criterion; additionally, any salient comments made by you about a specific criterion will be tracked. This data may be included in the thesis.

Please continue to use the Interobserver Job Aid you received earlier as your guide. As before, initially review each learning program independently and confidentially. Then, you may plan to do the interobserver agreement part over the telephone. At this point, I would ask that you discuss your differences in criteria the same as before but that you DO NOT mark any of your agreed upon changes on the lines provided for the checkmarks. Please plan to mark your changes in the margin to the left of the checkmark line (example enclosed). This should enable me to have clear data so that I can produce my graph and charts.
The Criterion Checklists are not inserted into the learning program but bundled together in the sequence you would use them. You have more than one Mastery Performance Checklist and Lesson Production Checklist. A learning program may require the designer to use more than one worksheet for each of these areas.

If you have any questions, please call me at 676-5202 (work) or 676-1528 (home). Otherwise, I look forward to seeing you on August 29.
To: Brenda Heerdt
   Tom Higgins
   Dora Lezovich
   Lowell Otter
   Mary Wendell

From: Karolyn Smalley

Date: November 25, 1990

Subject: ADDITIONAL RATER INFORMATION

After reviewing the data collected from the Program Design Evaluations, it appeared as if some clarification was needed. Question 1 asks, "Is the whole presented before the parts?". The whole can be depicted in several different ways: 1) a verbal description of the domain, main topic or theme of the learning, 2) one or more graphics that displays the "big picture" or gives an overview, or 3) an exercise early in the learning that facilitates the learners grappling with and determining major concepts within the domain. For example, the first coaching lesson in your rater training materials required the learners to define coaching by writing several sentences, listing phrases or drawing a picture. Any one of these methods may be used to represent the whole before getting into the parts.

The programs designed from the third edition of the job aid will be turned in within the next two weeks. As soon as I get them I will be sending them out to you. The end is in sight! Would anyone like a meeting or are we doing fine as is? If you have any concerns or want to discuss anything, please call me at 676-5202 (W) or 676-1528 (H). Hope your Thanksgiving was delightful!
Appendix H

Analysis-Design Instructional Guide, Version III
To:

From: Karolyn Smalley

Date: October 4, 1990

Subject: Analysis-Design Instructional Guide

Attached is the revised edition of the Analysis-Design Instructional Guide. Please use it for your next instructional design project. As you have done in the past, please either record your questions or concerns on a tape recorder as you encounter them; and/or write your concerns or questions on the job aid itself. Please write enough so that we can both understand the difficulty you are having.

You will notice that the Analysis-Design Instructional Guide has grown as a result of previous designer comments and concerns. Not all concerns were addressed. This was done as a conscious choice because the Analysis-Design Instructional Guide would have grown even larger and would have taken even more time to do. Depending on your suggestions maybe it can be done in the next iteration!

This time the booklet has been set up so that you may remove the worksheets and criterion checklists from their appendices rather than the Analysis-Design Instructional Guide itself. In this way, you have the complete Analysis-Design Instructional Guide as a reference and can make as many copies of the worksheets as are needed.

I am looking forward to your helpful suggestions as well as your next expertly designed program. THANK YOU!!
# TABLE OF CONTENTS

**Introduction**......2-4

Description of the Rapid Analysis Worksheet.......5  
Rapid Analysis Worksheet..........6-7  
Rapid Analysis Checklist.........8

Description of the Progress Planner Worksheet.......9  
Progress Planner Worksheet........10-11  
How to use the Progress Planner Worksheet........12-14  
Examples of Progress Planner Worksheet  
  Phase I..........15  
  Phase II..........16  
Description of Time-on-Task Worksheet........17  
Time-on-Task Worksheet........18  
Progress Planner Checklist.........19

Description of the Mastery Performance Worksheet.......20  
Mastery Performance Worksheet..........21-22  
Mastery Performance Checklist.........23

Description of the Lesson Production Worksheet.......24  
Lesson Production Worksheet..........25-26  
Key Components of Good Instructional Units..........27  
Examples of Lesson Production Worksheets  
  Coaching Course Lesson.........29-31  
  Coaching Lesson 1..........32-35  
  Coaching Lesson 2..........36-39  
Lesson Production Checklist.........40

Description of Program Evaluation.......41  
Program Evaluation........42

  Appendix A  
  Extra Worksheets

  Appendix B  
  Extra Checklists

1

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
INTRODUCTION

The Analysis-Design Instructional Guide is a tool that can be utilized by anyone who wants to design a learning program. The questions or descriptive words on the worksheets are guides. Answering the questions after or while talking to your client ensures that you find and focus on correct information. The descriptive words on other worksheets help you include all of the essential parts necessary for learning. Thus, the Analysis-Design Instructional Guide allows you to produce a learning program that adds essential knowledge or skills needed by the organization.

As you proceed through the worksheets, you may find yourself recycling through the same information more than once. This is meant to happen. The Analysis-Design Instructional Guide differs from other instructional processes in that you are asked to start designing almost immediately. This is done so that you may receive prompt timely feedback and make adjustments according to new information. The process will look like this:

![Diagram of the process]

There is an additional advantage to the cycling process. Your initially products will provide a structure around which meetings with your supervisor, project team mates and/or your client can be held. The discussions about the product(s) will give you additional information or in-sights so that your final products can be on target.
Overall, you will find that by using the Analysis-Design Instructional Guide you will be able to:

- identify the content of the program more easily.
- remain focused on the appropriate products while designing
- build a long-term partnership with your client, and
- produce a program that adds value to the organization.

How is the material in the Analysis-Design Instructional Guide arranged?

The Analysis-Design Instructional Guide has four (4) main worksheets. They are:

- Rapid Analysis -- RA
- Progress Planner -- PP
- Mastery Performance -- MP, and
- Lesson Production -- LP.

The worksheet sections are sequenced in the above order and contain:

- a Description of the Worksheet
- the Worksheet, and
- a Criterion Checklist for the Worksheet

Some sections include additional information such as guidelines on "How to Use" the worksheet, examples of completed worksheets, and a glossary of terms and definitions. They are placed where appropriate within the section.
There are two appendices. One contains extra worksheets and the other contains extra criterion checklists. This enables you to leave the Analysis-Instructional Guide as a booklet yet have worksheets and checklists easily available for use.

It is recommended that you browse through the entire Analysis-Design Instructional Guide so that you can familiarize yourself with what is here. Then, you are ready to begin. HAVE FUN!!!
A Description of the

RAPID ANALYSIS WORKSHEET

The RAPID ANALYSIS WORKSHEET is a tool used to collect general information about the project. It is used first. When using this worksheet you will analyze the following two major factors:

- the conditions within your current environment that will act as constraints upon the design process, Question 1,

and

- the client's environment, Questions 2 - 6.

Once you have collected that information, you will use Questions 7 - 10 to make some "best guesses" about the learning program you have been asked to design. This worksheet provides you with an overview and a potential direction for the project.
RAPID ANALYSIS WORKSHEET

1. Describe the constraints that you, the designer, will encounter while working on this program.

2. In two or three sentences describe the mastery performance that the client wants his/her performers to accomplish.

3. In two or three sentences describe how the performer's environment supports or encourages desired performance.

4. Describe the follow-up records that are used to determine if desired performance is maintained.

5. If performance is deficient, describe the parts of the performance that are not working as they should.
6. List the performance strengths that the performer(s) currently has.

7. If a performance improvement program is provided, how will the performer gain mastery?

8. What progress records will be available to tell the learner and yourself that progress is being made?

9. What general content will be contained within the course?

10. What will the inductive include that will convince people that it would be worthwhile to attend?
RAPID ANALYSIS CHECKLIST

Somewhere in the Rapid Analysis Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

____ 1. Are constraints on the designer listed?

____ 2. Is mastery performance described as a product or a service?

____ 3. Is environmental support for the performance described?

____ 4. Are follow-up records described so that performance can be maintained?

____ 5. Is there a description about what part of the performance is not working?

____ 6. Is there a description about the strengths of the learner?

____ 7. Is there a description about how the performer will gain mastery?

____ 8. Are progress records identified?

____ 9. Is the general learning content described?

____ 10. Are long-term and short-term benefits to the learner described in the inductive?
The PROGRESS PLANNER WORKSHEET is an organizational tool that allows you to plan -- what, how, when and at what cost -- you will build the individual products or complete the key tasks of designing your learning program. It is your "TO DO" list.
PROGRESS PLANNER WORKSHEET

1. As you complete each of the following worksheets, prepare a "To Do" list for this project based on the information you have just gained. Your list needs to emphasize products that result from the completion of the tasks not just the task.

RAPID ANALYSIS

MASTERY PERFORMANCE WORKSHEET

LESSON PRODUCTION
**PHASE II of PROGRESS PLANNER WORKSHEET**

**PROJECT ACTION PLAN**

<table>
<thead>
<tr>
<th>TASK PRODUCTS</th>
<th>TASK STEPS</th>
<th>DATES</th>
<th>PREDICTED COSTS</th>
<th>ACTUAL COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List the products and steps needed to complete the task. List deadlines and projected costs for each task. Add the actual costs as they become known.
"How to USE the PROGRESS PLANNER"

To complete question 1 of the Progress Planner Worksheet,

<table>
<thead>
<tr>
<th>Do</th>
<th>Then</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Review your completed Rapid Analysis Worksheet.</td>
<td>1. Write on the Progress Planner Worksheet under the subtitle Rapid Analysis Worksheet a list of products or key tasks that you think you will have to do in order to build this program. Note: This is your best guess at this time (see example on page 00.).</td>
</tr>
<tr>
<td>2. Continue to the Mastery Performance Worksheet and complete it/them for your program.</td>
<td>2. Return to question 1 of the Progress Planner Worksheet and under the subtitle Mastery Performance Worksheet list the products or key tasks that you will have to do. Note: Some products or tasks may stay the same as you predicted under your listing for the Rapid Analysis Worksheet; however, you may now have a different vision of that product and may want to describe it. In addition, you will probably have found new products or tasks that need doing.</td>
</tr>
<tr>
<td>3. Continue to the Lesson Production Worksheet and complete it/them for your program.</td>
<td>3. Return to question 1 of the Progress Planner Worksheet and under the subtitle Lesson Production list the products or key tasks that you think you will have to complete.</td>
</tr>
</tbody>
</table>
You have now completed Phase I of the Progress Planner Worksheet. If the Progress Planner Worksheet is used to generate possible products and/or tasks after the completion of every worksheet you use, you will have a very complete list. You may also discover that your ideas expanded or changed as you moved from one worksheet to another. This should happen. You continue to gain new information as you analyze and design.

You are ready to do Phase II — answer questions 2 and 3 — of the Progress Planner Worksheet (See example on page 00).

<table>
<thead>
<tr>
<th>Do:</th>
<th>Then:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Review your product and task lists in question 1.</td>
<td>1. Create a single master list of products and tasks sequencing them in the order in which you will do them.</td>
</tr>
<tr>
<td>2. Identify key steps to produce each product or complete each task.</td>
<td>2. Write the key steps sequencing them as they should be completed.</td>
</tr>
<tr>
<td>3. Estimate your hours per task.</td>
<td>3. Calculate the cost of that product or task by using your hourly wage.</td>
</tr>
<tr>
<td>4. Estimate completion dates for each key step.</td>
<td>4. Write those.</td>
</tr>
</tbody>
</table>

Note: Include estimated hours per task as well as costs on the worksheet.

Phase II of the Progress Planner Worksheet only needs actual costs added. You can gather that information by using the Time-on-Task Worksheet that is on page 13.

You can now use your Progress Planner in two ways. First, you can use it to discuss questions and concerns about the development of the program with your client and/or your supervisor. This should lead to clearer expectations and reduce the potential for misunderstandings and costly rework. Secondly, once you and the
client and/or your supervisor have agreed upon the Progress Plan, you have a self-monitoring checklist for managing your project.
EXAMPLE

PHASE 1

PROGRESS PLANNER WORKSHEET

1. As you complete each of the following worksheets, prepare a "To Do" list for this project based on the information you have just gained. Your list needs to emphasize products that result from the completion of the tasks not just the task.

RAPID ANALYSIS

Research Coaching Models
1. Home library do literature search

Design a feedback instrument for coaches
1. Make is a checklist that answers the question "How am I doing as a coach?" Quick & easy to use.
2. Identify group who will pilot
3. Pilot
4. Revise; repeat until user friendly & gives accurate order coaching book

MASTERY PERFORMANCE WORKSHEET

Identify communication skills essential to coaching
1. Choose skills to teach
2. Design formats
3. Design examples

Create examples of performance feedback graphs
Design a feedback instrument for coaching to use with one performer regarding the use of coaching techniques

LESSON PRODUCTION (COURSE)

Plan a thought provoking Inductive
1. Generate questions
2. Sequence for greatest effect
3. Present to someone for feedback

Design a coaching plan
Provide weekly instructional agenda
Complete an evaluation form for the course
### EXAMPLE

**PHASE II of PROGRESS PLANNER WORKSHEET**

**PROJECT ACTION PLAN**

1. **List the products and steps needed to complete the task.**
2. **List deadlines and projected costs for each task.**
3. **Add the actual costs as they become known.**

<table>
<thead>
<tr>
<th>TASK PRODUCTS</th>
<th>TASK STEPS</th>
<th>DATES</th>
<th>PREDICTED COSTS</th>
<th>ACTUAL COSTS</th>
</tr>
</thead>
</table>
| Coaching Summary Written | 1. **Identify the necessary tools**
| | 2. **Review**
| | 3. **Write a concise summary on coaching models** | 12-16-99 | $10,000 (Actual Costs) |
| Communication Skills Essential to Coaching Identified | 1. **Choose skills to teach**
| | 2. **Design format**
| | 3. **Design examples** | 1-3-99 | $500, $300, $500 |
| Coaching Plan Designed | 1. **Design a plan**
| | 2. **Prepare instructions on how to use**
| | 3. **Select approaches of coaching to pilot**
| | 4. **Post**
| | 5. **Review based on feedback** | 1-18-99 | $800, $200, $500 |
| Inducive Designed | 1. **Generate questions**
| | 2. **Sequence the guides for effect**
| | 3. **Present to someone for feedback** | 2-9-99 | $3,000, $20, $30 |

| 16 |
A Description of the

TIME-ON-TASK WORKSHEET

The TIME-ON-TASK WORKSHEET allows you to capture how much time per phase a particular program has taken to analyze and design. The time per category will be used to calculate the actual costs to produce your program. In addition, it allows you to evaluate your performance and determine where you might like to gain additional knowledge and skills so that you can gain proficiencies. Lastly, it will help you to plan future projects and to write accurate proposals for them. This helps build good strong client relationships.
**TIME-ON-TASK WORKSHEET**

After the day write the date; then in the appropriate column write the amount of time worked.

<table>
<thead>
<tr>
<th>Days</th>
<th>RA</th>
<th>MP</th>
<th>PP</th>
<th>LP</th>
<th>Pilot</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
PROGRESS PLANNER CHECKLIST

Somewhere in the Progress Planner Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

____1. Are products from a task described?
____2. Are steps for each task listed?
____3. Has the Progress Planner been converted to a Program Action Plan?
____4. Are completion dates listed?
____5. Are predicted costs listed for each task or product?
A Description of the

MASTERY PERFORMANCE WORKSHEET

The MASTERY PERFORMANCE WORKSHEET focuses on the products and/or services that are to be produced by the performer on the job. The products and services are systematically reviewed for all necessary critical dimensions: inputs, processes, feedback, receivers, etc. This worksheet is significant because it helps you stay on target and produce performance-based training. Since performance on the job may require more than one major product and/or service, this worksheet may be used as many times as is necessary.
MASTERY PERFORMANCE WORKSHEET

Name of Performer Interviewing ___________________

Use one worksheet for each major job product/service.

Product/service:
1. What does the master performer produce?

Inputs/raw materials:
2. What is transformed?

Processing System/tools:
3. What job aids, guides, and/or personnel assistance are available while the performer is working?
Products and Process Feedback:
Quantity Standards
4. What are the requirements and goals?

Quality Standards
5. What are the requirements and goals?

Receiving System/receiver:
6. Who receives, handles, or uses the product external to the performer's department or organization?

Use and Value Feedback:
Evaluation
7. How are the performer's products evaluated by the receiver?

Evaluator
8. Who sees or uses the evaluative information from the receiver?
MASTERY PERFORMANCE CHECKLIST

Somewhere in the Mastery Performance Worksheet you should describe the following areas. Place a *checkmark* in front of each question that can be answered with a "Yes".

____ 1. Is a tangible product listed?

____ 2. Are inputs or raw materials that can be transformed into the major product described?

____ 3. Are examples, job aids, and/or people available for assistance, while performance is occurring, described?

____ 4. Are standards for the quantity of the products described?

____ 5. Are standards for the quality of the product described?

____ 6. Is a receiver external to the producer(s) of the product listed?

____ 7. Is there a description of the product evaluation by the receiver?

____ 8. Is there a listing of the person(s) who receives the evaluation?
LESSON PRODUCTION WORKSHEET

The LESSON PRODUCTION WORKSHEET is a tool that ensures that you have included in a lesson all essential components necessary for learning. These components are critical if a learner is to begin learning; if the learner is to learn throughout the lesson; and if the learner is to retain, transfer, and use what was learned once the course/lesson is finished. This worksheet will enable you to:

• use a systematic approach for designing each course and/or lesson so that it is complete
• improve the likelihood of designing a lesson where learners will succeed and you can see them succeed
• gain efficiencies in use of your design time as you become proficient in using the worksheet
• improve your design techniques as you see which components of the worksheet you continually design successfully; this enables you to focus your improvement efforts on areas that are working less well, and
• become more confident with your design techniques as you produce programs that impact overall organizational results.

You will use this worksheet numerous times when you design a learning program. Initially, use it to design the learning program lesson as a whole (course). Then use it to design single lessons. You may even go a step further and use it to design the individual learning components of the worksheet itself, i.e. such as the Inductive. This is a very rigorous application of the worksheet and ensures that you are complete. In addition, you then have very specific parts that can be evaluated to determine what is and is not working. Consider using the worksheet rigorously for those parts of the learning that you and the client have agreed are critical; otherwise, rigorous application probably will not add enough value to do it to all parts of the learning. The continuous cycling of this worksheet acts as a check and balance. It ensures that all necessary components for providing a high quality lesson are included.
LESSON PRODUCTION WORKSHEET

1. Inductive:

2. Educative Processes:

Domain - Generalization
   • Given -
   • Do

Demonstration
   • Given -
   • Do -
Guided Practice

- Given -

- Do -

3. Demonstration of Mastery

4. Progress Records (or other device to enable student to see progress of the lesson):

5. Follow-up Records (to see if Mastery is maintained):

6. Follow-up Support
KEY COMPONENTS
of
GOOD INSTRUCTIONAL UNITS

Each workshop, or other well-structured learning experience, has a specific set of components:

- An Inductive, a Domain, Demonstrations, Guided Practice, Demonstrations of Mastery, Progress Records, and Follow-up.

The Inductive is defined broadly as all the procedures used to attract students, arouse their interest, and obtain their involvement in the instruction.

A Domain is a set of core ideas or key concepts or principles; the content or scope of the instruction; the knowledge, skills, and/or attitudes to be developed; the material to be added to the Initial repertoire to obtain mastery.

A Demonstration is a way of showing learners what Mastery is and what must be added to their initial repertoire to achieve Mastery; a set of guidelines for learning; a modeling of good performance.

Guided Practice is prompting; coaching; modeling how to learn; using examples and non-examples to direct the learner's attention to key parts of the domain; using practice exercises, lessons, assignments.

Progress Records or indicators are ways of providing feedback about such things as test scores, completed assignments, quality checks, time elapsed in "on task" activities, comparisons of early and later work samples, the effectiveness of projects the learners implemented.

Demonstrations of Mastery are tests, presentations, papers, project write-ups, debates, projects, analyses, designs, etc. that enable learners and others to see that mastery has been achieved.

Follow-up support is providing technology and reference material for the learners to carry away with them; making arrangements for coaching with bosses and mentors and support groups; doing inspections and providing awards; making inquiries about how things are going; providing consultation services; providing, data about how the (former) learners are doing, other courses in a curriculum, other lessons in a course, etc.

All the parts are needed to bring learners into the instruction, orient them to what it's all about, show them what to do, help them do it well, allow them to see that they are progressing, allow them to see and to show what they've mastered, and support them in using what they've learned.

Copyright 1987 by Dale M. Brethower, PhD Schoolcraft, Mi.
On the LESSON PRODUCTION WORKSHEET each of the parts of the educative process will include a "given" and a "do". The "given" will list all necessary learning tools; it may contain reference to the behavior repertoire (current knowledge and skills that a learner will enter the lesson with) of the learner. The "do" will identify some action the learner must take in response to the "given".
COACHING LESSON
for the COURSE

1. Inductive

Provide general information about each lesson and why it is important. Review the previous weeks lesson results and tie it back to the definition of "coaching" established by each group. Determine a series of questions or design an exercise the learners can use to determine what knowledge/skills they currently possess and what each can gain from the coming lesson.

2. Educative Processes

Domain - generalization

- Given: The coaching concepts and examples from reading Ferdinand Fournies book *Coaching for Improved Work Performance* and from seeing his video; the coaching concepts and examples from reading the handouts on Goals, Reflective Listening, Praising and Problem Solving; and the behavior repertoire from the learners past experience, education, and training.

- Do: Read and identify a minimum of two questions from each of the readings.

Demonstration/outputs

- Given: Same as above plus a Coaching Plan and performance data about the person to be coached.

- Do: Complete the Coaching Plan and ask the above questions in relation to the Coaching Plan and readings.
Practice

- **Given:** Same as above plus specific learning exercises for goals, reflective listening, praising, and problem solving. Collection of performance data for coaching. Feedback from a performer about the coach's delivery using the Coaching Evaluation.

- **Do:** Complete each exercise with a partner. Plan for the use of the concepts in the work unit during the following week; share the previous week's results with the group; plan for continuous improvement.

3. **Mastery Performance**

The learners will have written a minimum of one Coaching Plan and implemented it during the 5 weeks of the course. The goal will be written in measurable/observable terms. Data collection will have started; the data will be used a minimum of twice weekly during the practice of the coaching skills of praising and/or problem solving. Reflective listening will be used to help the performer sort and clarify issues or identify direction for him/herself; or when the coach does not have an answer to a problem and/or the performer needs to "dump".

4. **Progress Records**

A course schedule that includes the class dates, time, readings and individual lesson accomplishment(s) will be published and distributed at the first class meeting. Each class will have a published agenda.

5. **Follow-up Records**

The concepts used in the early lessons will be incorporated into the later lessons and learners will be asked to share new examples at each succeeding session. The Coaching Plan may be revised until it meets the coaches needs.
6. Follow-up Support

Learners may complete other Coaching Plans so that they have one for each direct report. They may also call the instructor with any questions/concerns during the next year. In addition, many learners have peers or supervisors who have previously attended and participated in the Coaching Class. Previous attendees may act as support to new learners.
1. Introduction

Welcome

Introductions
- name, job title & responsibilities
- accomplishment within last 6 months

Interview in pairs - 3 minutes each, switch; introduce partner

What is Coaching? (Define coaching)
- small groups
- 8 minutes to come up with a definition
  - bullets, sentences, picture, etc.
- debrief by sharing definition and how arrived at it with large group

Ask series of questions to get at benefits:
- Where do you find the best coaches?
- What is happening as people get more talented?
- What do these coaches do?
- How do these coaches know when they are doing well?

- Imagine that you are going to hire someone and you have two equally qualified candidates; however, you knew that one was more coachable than another. Who would you hire?
- How much knowledge and skill would you give up in order to get a coachable person?
- If all employees were coachable, what would the benefits be to you and to the organization?
- What kind of a person do you think your boss would like working for him or her?

Let's make sure our bosses have one coachable person!!!
2. Educative Processes - Exercise 1

Domain - Generalization

Given: Coaching for Improved Work Performance by Ferdinand F. Fournies; and any past experience or education.

Do: Read from the book.

Demonstration/Output

Given: Same as above.

Do: Ask questions and share insights in order to produce a definition of coaching.

Practice

Given: Same as above plus the definitions of coaching.

Do: Answer the questions asked by the facilitator; challenge the questions and the answers given by the group.

3. Mastery Performance

A flip chart page with a definition of coaching as produced by the learner's small group.

Another flip chart list of what "exemplary" or "model" coaches do; and a listing of how that is measured or a listing of benefits for becoming a professional coach.
2. Educative Processes - Exercise 2

Domain - Generalization

Given: *Coaching for Improved Work Performance* by Ferdinand F. Fournies; the small group Coaching definitions and list of benefits; definitions of "sensationals" and "how abouts" and a description of the learning process to be used in this program; and any past experience or education.

Do: Read the assigned chapters.

Demonstration/outputs

Given: Same as above.

Do: Write 3 - 5 "sensationals" and 2-3 "how abouts" per chapter.

Practice

Given: Same as above.

Do: Individually share "sensationals" and "how abouts"; discuss similarities and differences of examples.

3. Mastery Performance

Delivering positive or motivational feedback in a way that can be heard by the group and built upon by individuals within the group. Deliver negative or developmental feedback as questions. (Usually timed to be done when the performer is about to practice or about to do the task. [Focusing and redirecting performance] They act as discriminating stimuli.)

4. Progress Records

The learner can check off the chapters as s/he reads them; and can mark or write three to five "sensationals" and two to three "how abouts" per chapter.

Can see the completion of each activity as progress is made through the agenda (written on the board with time allotments).
5. Follow-Up Records

On a daily basis plan to coach using "sensationals" and "how abouts". Include these in an individual coaching plan and evaluate delivery through the Coach's Evaluation Sheet which will be completed by a partner.

6. Follow-Up Support

Complete the first page of the Individual Coaching Plan for next week. (have one copy, which can be left with Karolyn). The information on the first page of the plan will be shared and revised next week within a small group.
COACHING LESSON/CLASS 2

1. Introduction

Review "sensationals" and "how abouts" in terms of coaching definitions.
- What is one thing you did differently this past week based on what you learned last week?
- How did that benefit you? How did that benefit others?

Only when we correctly identified the performance that we want and can state it clearly, can we begin to coach. That clarity enables us to discriminate more specifically about what is correct about the day-to-day performance of the individual and what needs further improvement.

This Coaching Plan was put together so that it could represent a single person. (what)

It was done this way instead of for a group of workers because each person will have different talents and different areas that need improvement. And, even though individuals may work in the same job classification, you may need slightly different performance from one individual than another because of the type of work that the unit needs to complete. (why)

What are the benefits of using a Coaching Plan?
- Clear with self about performance getting and what's needed
- Set goals and subgoals on how to get there
- Will know if it's happening (monitoring)
- Can deliver the appropriate feedback in a timely manner

What are your concerns about using a Coaching Plan?
2. Educative Processes - Exercise 1

Domain - Generalization

Given - Coaching Book; individual Coaching Plans; and the handout on Reflective Listening.

Introduction - We're now going to spend some time on a skill called Reflective Listening. It is an enhancement to the IMS skill of clarifying. We will use this skill in a few minutes to review our Coaching Plans.

Do - Read the handout on reflective listening.

Demonstration/output

Given - Same as above.

Do - Make a list of questions about information that seems unclear from the readings. Individually review the Coaching Plan that you wrote. Identify parts of the situation and/or information (place a checkmark next to that content) where you think reflective listening may help you get more specific and clear.

Practice

Given - Same as above.

Do - Using your Coaching Plan describe your situation to a partner or small group; your partner or small group will use reflective listening skills to facilitate their understand of your situation. They may also use clarifying and confirming to further understand any part that seems unclear to them. Revise your plan based on the questions and feedback from your partner or small group.
3. Mastery Performance

Your Coaching Plan has been revised; if there were questions asked that you could not clearly answer, write those questions down so that you can gather the appropriate data after class.

4. Progress Records

You can identify those situations "when" you will use reflective listening and know "why" you are doing it. In addition, you can identify examples of reflective listening versus examples of clarifying.

5. Follow-up records and support

For a week record the number of times staff come to you and you use your reflective listening skills. Be prepared to describe that situation next week and tell us how the reflective listening benefited you.

2. Educatve Processes - Exercise 2

Domain - Generalization

Given: The Coaching Book, your individual Coaching Plan, the handout on Goals, and past training, education, and/or experience.

Introduction: Now that you have had a chance to discuss and revise your coaching situation, let's read how to write the Coaching Goal.

Do: Read the handout on Goals. Identify questions you would like answered.
Demonstration/Output

Given: Same as above.

Do: Discuss your questions within your small group; identify a minimum of two questions that your group will share with the large group.

Practice

Given: Same as above.

Do: Take 5-10 minutes as an individual and write a goal for the individual in your Coaching Plan. Share this goal with your small group. Individual group members need to identify "sensationals" and "how abouts" for the goal you have written.

3. Mastery Performance

One Coaching Plan developed and ready for implementation;
  * expectations stated as a measureable/observable goal
  * data are available or can be gathered
  * recognition can be planned.

4. Progress Records

At the conclusion of the small group discussion, review and revise your individual goal(s). The goals should be measureable/observable. They also should describe a cost savings, quantity &/or quality performance, and/or timeliness.

5. Follow-up Records and Support

Plan to share your main goal with the large group the next scheduled class time.
LESSON PRODUCTION CHECKLIST

Somewhere in the Lesson Production Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

1. Is the question "why is this important to the attendees?" answered?

2. Is the general content, concept(s) or main theme of the course/lesson described?

3. Is there a demonstration of "how" the task or processes works?

4. Are there examples and non-examples for discrimination learning in the "given" of the Educative Processes?

5. Are exercises provided that enable the learner to practice the new concept(s), output, or processes?

6. Is immediate feedback available?

7. Is mastery performance described as an accomplishment or an output with its corresponding standards?

8. Is there a plan or progress record that tells the learner how s/he is advancing through the lesson?

9. Are there follow-up records in the learner's environment that show him/her how s/he is doing in using what was learned?

10. Is follow-up support from the learner's environment listed?
A Description of the

PROGRAM DESIGN EVALUATION

Once you have completed the analysis-design of a learning program or even a module of a learning program it needs to be evaluated against established design criteria. The next page lists important design criteria in the form of questions. Please review your completed program or module against these criteria.

If you have met the design criteria, CONGRATULATIONS!!!
If you have not, please discuss a plan of action with your project manager and/or your client.
PROGRAM DESIGN EVALUATION

Place a *checkmark* in front of each question that can be answered with a "Yes".

____1. Is the whole presented before the parts?

____2. Is the learner required to produce a tangible product at the end of each course/lesson?

____3. Does the sequence of learning subproducts lead to a major accomplishment?

____4. Are tools and resources listed for each step of the course/lesson?

____5. Is feedback available at each step of the course/lesson?

____6. Is there a course/lesson progress plan including dates and times for each learner?

____7. Is there a course evaluation tool for the learner?

____8. Is there a plan for the administration of the course?
APPENDIX A

EXTRA WORKSHEETS
RAPID ANALYSIS WORKSHEET

1. Describe the constraints that you, the designer, will encounter while working on this program.

2. In two or three sentences describe the mastery performance that the client wants his/her performers to accomplish.

3. In two or three sentences describe how the performer's environment supports or encourages desired performance.

4. Describe the follow-up records that are used to determine if desired performance is maintained.

5. If performance is deficient, describe the parts of the performance that are not working as they should.
6. List the performance strengths that the performer(s) currently has.

7. If a performance improvement program is provided, how will the performer gain mastery?

8. What progress records will be available to tell the learner and yourself that progress is being made?

9. What general content will be contained within the course?

10. What will the inductive include that will convince people that it would be worthwhile to attend?
PROGRESS PLANNER WORKSHEET

1. As you complete each of the following worksheets, prepare a "To Do" list for this project based on the information you have just gained. Your list needs to emphasize products that result from the completion of the tasks not just the task.

RAPID ANALYSIS WORKSHEET

MASTERY PERFORMANCE WORKSHEET

LESSON PRODUCTION WORKSHEET
**PHASE II of PROGRESS PLANNER WORKSHEET**

**PROJECT ACTION PLAN**

<table>
<thead>
<tr>
<th>TASK PRODUCTS</th>
<th>TASK STEPS</th>
<th>DATES</th>
<th>PREDICTED COSTS</th>
<th>ACTUAL COSTS</th>
</tr>
</thead>
</table>

List the products and steps needed to complete the task. List deadlines and projected costs for each task. Add the actual costs as they become known.
TIME-ON-TASK WORKSHEET

After the day write the date; then in the appropriate column write the amount of time worked.

<table>
<thead>
<tr>
<th>Days</th>
<th>ANALYSIS</th>
<th>DESIGN and DEVELOP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RA</td>
<td>MP</td>
</tr>
<tr>
<td></td>
<td>PP</td>
<td>LP</td>
</tr>
<tr>
<td></td>
<td>Pilot</td>
<td>Test</td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MASTERY PERFORMANCE WORKSHEET

Name of Performer Interviewing _______________________

Use one worksheet for each major job product/service.

Product/service:
1. What does the master performer produce?

Inputs/raw materials:
2. What is transformed?

Processing System/tools:
3. What job aids, guides, and/or personnel assistance are available while the performer is working?
Outputs and Process Feedback:
Quantity Standards
4. What are the requirements and goals?

Quality Standards
5. What are the requirements and goals?

Receiving System/receiver:
6. Who receives, handles, or uses the product external to the performer's department or organization?

Use and Value Feedback:
Evaluation
7. How are the performer's products evaluated by the receiver?

Evaluator
8. Who sees or uses the evaluative information from the receiver?
LESSON PRODUCTION WORKSHEET

1. Inductive:

2. Educative Processes:

   Domain - Generalization
   • Given -
   • Do

   Demonstration
   • Given -
   • Do -
Guided Practice

- Given -

- Do -

3. Demonstration of Mastery

4. Progress Records (or other device to enable student to see progress of the lesson):

5. Follow-up Records (to see if Mastery is maintained):

6. Follow-up Support
APPENDIX B

EXTRA CHECKSHEETS

and

PROGRAM EVALUATION
RAPID ANALYSIS CHECKLIST

Somewhere in the Rapids Analysis Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

1. Are constraints on the designer listed?
2. Is mastery performance described as a product or a service?
3. Is environmental support for the performance described?
4. Are follow-up records described so that performance can be maintained?
5. Is there a description about what part of the performance is not working?
6. Is there a description about the strengths of the learner?
7. Is there a description about how the performer will gain mastery?
8. Are progress records identified?
9. Is the general learning content described?
10. Are long-term and short-term benefits to the learner described?
PROGRESS PLANNER CHECKLIST

Somewhere in the Progress Planner Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

1. Are products from a task described?
2. Are steps for each task listed?
3. Has the Progress Planner been converted to a Program Action Plan?
4. Are completion dates listed?
5. Are costs listed for each product?
MASTERY PERFORMANCE CHECKLIST

Somewhere in the Mastery Performance Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

1. Is a tangible product listed?

2. Are inputs or raw materials that can be transformed into the major product described?

3. Are examples, job aids, and/or people available for assistance, while performance is occurring, described?

4. Are standards for the quantity of the product described?

5. Are standards for the quality of the product described?

6. Is a receiver external to the producer(s) of the product listed?

7. Is there a description for product evaluation by the receiver?

8. Is there a listing of the person(s) who receives the evaluation?
LESSON PRODUCTION CHECKLIST

Somewhere in the Lesson Production Worksheet you should describe the following areas. Place a checkmark in front of each question that can be answered with a "Yes".

1. Is the question "why is this important to the attendees?" answered?

2. Is the general content, concept(s) or main theme of the course/lesson described?

3. Is there a demonstration of "how" the task or processes works?

4. Are there examples and non-examples for discrimination learning in the "given" of the Educative Processes?

5. Are exercises provided that enable the learner to practice the new concept(s), product, or processes?

6. Is immediate feedback available?

7. Is mastery performance described as a product or service with its corresponding standards?

8. Is there a plan or progress record that tells the learner how s/he is advancing through the lesson?

9. Are there follow-up records in the learner's environment that show him/her how s/he is doing in using what was learned?

10. Is follow-up support from the learner's environment listed?
PROGRAM DESIGN EVALUATION

Place a checkmark in front of each question that can be answered with a "Yes".

___1. Is the whole presented before the parts?

___2. Is the learner required to produce a tangible product at the end of each course/lesson?

___3. Does the sequence of learning subproducts lead to a major product?

___4. Are tools and resources listed for each step of the course/lesson?

___5. Is feedback available at each step of the course/lesson?

___6. Is there a course/lesson progress plan including dates and times for each learner?

___7. Is there a course evaluation tool for the learner?

___8. Is there a plan for the administration of the course?
Appendix I

Rater Matrix and Criteria Met Records
## RATER and PROGRAM MATRIX

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>RATERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>1. Feedback</td>
<td>x</td>
</tr>
<tr>
<td>2. Job Requirements</td>
<td>x</td>
</tr>
<tr>
<td>3. Excel</td>
<td>x</td>
</tr>
<tr>
<td>4. Data Management</td>
<td>x</td>
</tr>
<tr>
<td>5. Supervisory—Safety</td>
<td></td>
</tr>
<tr>
<td>6. Word Perfect III</td>
<td>x</td>
</tr>
<tr>
<td>7. Paradox</td>
<td>x</td>
</tr>
<tr>
<td>8. Communications</td>
<td>x</td>
</tr>
<tr>
<td>9. Performance Appraisal</td>
<td>x</td>
</tr>
<tr>
<td>10. Supervisory—My Role</td>
<td>x</td>
</tr>
<tr>
<td>11. Supervisory—Interactive Meetings</td>
<td>x</td>
</tr>
<tr>
<td>12. Windows</td>
<td>x</td>
</tr>
<tr>
<td>13. Professional Write</td>
<td></td>
</tr>
<tr>
<td>14. Word Perfect III (revised)</td>
<td>x</td>
</tr>
<tr>
<td>LP Crit</td>
<td>1</td>
</tr>
<tr>
<td>---------</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program</th>
<th>Design Eval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>RA Crit.</td>
<td>Obs. 1</td>
</tr>
<tr>
<td>---------</td>
<td>--------</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>X</td>
</tr>
<tr>
<td>Average</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PP Crit</th>
<th>Obs. 1</th>
<th>Obs. 2</th>
<th>Obs. 3</th>
<th>Obs. 4</th>
<th>Obs. 5</th>
<th>Obs. 6</th>
<th>Obs. 7</th>
<th>Obs. 8</th>
<th>Obs. 9</th>
<th>Obs. 10</th>
<th>Ave.</th>
<th>Ave.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Average</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MP Crit</th>
<th>Obs. 1</th>
<th>Obs. 2</th>
<th>Obs. 3</th>
<th>Obs. 4</th>
<th>Obs. 5</th>
<th>Obs. 6</th>
<th>Obs. 7</th>
<th>Obs. 8</th>
<th>Obs. 9</th>
<th>Obs. 10</th>
<th>Ave.</th>
<th>Ave.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Average</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
<table>
<thead>
<tr>
<th>RA Crit.</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AVERAGE: 10/10 10/10 6/10 8/10

TOTAL: 10/10 10/10 6/10 8/10

PP Crit

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MP Crit

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AVERAGE: 7.5 7.5 4.5 4.5

After: 7.5 7.5 4.5 4.5
<table>
<thead>
<tr>
<th>LP Crit</th>
<th>Program A</th>
<th>Program B</th>
<th>Program C</th>
<th>Program D</th>
<th>Program E</th>
<th>Program F</th>
<th>Program G</th>
<th>Program H</th>
<th>Program I</th>
<th>Program J</th>
<th>Program K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Program 8/10 7/10 2/10 4/10 8/10 7/10 2/10 4/10 8/10 7/10 2/10 4/10**

**Design Eval**

<table>
<thead>
<tr>
<th></th>
<th>Program A</th>
<th>Program B</th>
<th>Program C</th>
<th>Program D</th>
<th>Program E</th>
<th>Program F</th>
<th>Program G</th>
<th>Program H</th>
<th>Program I</th>
<th>Program J</th>
<th>Program K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>


Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
<table>
<thead>
<tr>
<th>RA Crit.</th>
<th>Program 27</th>
<th>Program 28</th>
<th>Program 32</th>
<th>Program 40</th>
<th>Program 42</th>
<th>Program 50</th>
<th>Program 53</th>
<th>Program 54</th>
<th>Program 56</th>
<th>Program 57</th>
<th>Program 58</th>
<th>Program 60</th>
<th>Program 64</th>
<th>Program 68</th>
<th>Program 77</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEFORE</td>
<td>410</td>
<td>710</td>
<td>410</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AFTER</td>
<td>310</td>
<td></td>
<td></td>
<td>110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| PP Crit  |
|----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1        | o          | x          |            |            |            |            |            |            |            |            |            |            |            |            |            |
| 2        | x          | x          | x          |            |            |            |            |            |            |            |            |            |            |            |            |
| 3        | x          | x          |            |            |            | x          |            |            |            |            |            |            |            |            |            |
| 4        | x          | x          |            |            |            |            |            |            |            |            |            |            |            |            |            |
| 5        | x          | x          |            |            |            |            |            |            |            |            |            |            |            |            |            |
| BEFORE   | 415        | 35         |            |            |            |            |            |            |            |            |            |            |            |            |            |
| AFTER    | 50         |            |            |            |            |            |            |            |            |            |            |            |            |            |            |

| MP Crit  |
|----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1        | x          | x          | x          |            | x          | x          | x          |            | x          | x          | x          | x          | x          | x          | x          |
| 2        | x          | x          |            |            | x          | x          |            |            | x          | x          | x          | x          |            |            |            |
| 3        | x          | x          |            |            |            | x          | x          | x          |            | x          | x          | x          |            |            |            |
| 4        | x          | x          | x          |            | x          | x          | x          | x          | x          | x          | x          | x          | x          | x          | x          |
| 5        | x          | x          |            |            |            |            |            |            |            |            |            |            |            |            |            |
| 6        | x          | x          | x          |            |            |            |            |            |            |            |            |            |            |            |            |
| 7        | x          | x          |            |            |            |            |            |            |            |            |            |            |            |            |            |
| 8        | x          | x          |            |            |            |            |            |            |            |            |            |            |            |            |            |
| BEFORE   | 415        | 418        | 78         |            |            |            |            |            |            |            |            |            |            |            |            |
| AFTER    | 318        |            |            |            |            |            |            |            |            |            |            |            |            |            |            |
|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 2       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 3       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 4       | O X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 5       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 6       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 7       | X O X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 8       | X X O X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 9       | X X O X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |
| 10      | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       | X X X X       |

**Program Design Eval**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X O X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
</tr>
<tr>
<td>2</td>
<td>O X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
</tr>
<tr>
<td>3</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
</tr>
<tr>
<td>4</td>
<td>O X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
</tr>
<tr>
<td>5</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
</tr>
<tr>
<td>6</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
</tr>
<tr>
<td>7</td>
<td>O X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
</tr>
<tr>
<td>8</td>
<td>O X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X</td>
</tr>
</tbody>
</table>

**Before**

<p>| | | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**After**

<p>| | | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9/10</td>
<td>9/10</td>
<td>9/10</td>
<td>9/10</td>
<td>9/10</td>
<td>9/10</td>
<td>9/10</td>
<td>9/10</td>
<td>9/10</td>
<td>9/10</td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
| RA Crit. | Program 1 | Program 2 | Program 3 | Program 4 | Program 5 | Program 6 | Program 7 | Program 8 | Program 9 | Program 10 | Program 11 | Program 12 | Program 13 | Program 14 | Program 15 | Observation 1 | Observation 2 | Observation 3 | Observation 4 | Observation 5 | Observation 6 | Observation 7 | Observation 8 | Observation 9 | Observation 10 |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1        | X         | X         |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 2        | X         |           | X         |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 3        |           | X         | X         |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 4        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 5        | X         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 6        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 7        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 8        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 9        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 10       |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |

**PP Crit**

| 1        | X         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 2        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 3        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 4        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 5        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |

**MP Crit**

| 1        | X         |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 2        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 3        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 4        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 5        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 6        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 7        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 8        |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |                  |                 |                 |                 |                 |                 |                 |                 |                 |                 |

**Rating**

- RA: 9/10
- PP: 9/10
- MP: 9/10

**Score**

- RA: 9/10
- PP: 9/10
- MP: 9/10
<table>
<thead>
<tr>
<th>LP Crit</th>
<th>Obs. 1</th>
<th>Obs. 2</th>
<th>Obs. 3</th>
<th>Obs. 4</th>
<th>Obs. 5</th>
<th>Obs. 6</th>
<th>Obs. 7</th>
<th>Obs. 8</th>
<th>Obs. 9</th>
<th>Obs. 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Design Eval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
</tbody>
</table>

Notes: 4/10, 3/10, 4/10, 4/10
BIBLIOGRAPHY


