The proceedings represent the presentations made at the Fifth TRADOC Chiefs of Analysis Seminar held at the Motor House Inn, Williamsburg, VA, 24-27 February 1981. The major theme of this seminar was Alternative Approaches to Front End Analysis (FEA)--the Schools and the Technologists. The purpose of this seminar was to provide a forum to address training analysis issues, to consider the current state-of-the-art activities within front end analysis/performance technologies, to resolve problems within the TRADOC community attendant to each, and to allow service school chiefs of analysis to interact with the ORAD staff (TRADOC proponent for front end analysis policy and training).
DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.
1. The 5th Chiefs of Analysis Seminar was held at the Cascade Meeting Center of the Motor House Inn in Colonial Williamsburg, VA from 24-27 February 1981. The theme of this seminar was: Alternative Approaches to Front-End Analysis (FEA) – the Schools and the Technologists.

2. The sponsor of this seminar was the Occupational Research and Analysis Division (ORAD) of the Training Developments Institute (TDI), Ft Monroe, VA 23651. The project officer/seminar coordinator was MSG Don Mitchell (telephone: AC (804) 727-3608, AUTOVON 680-3608).

3. The purpose of this seminar was to provide a forum to address training analysis issues, to consider the current state-of-the-art activities within front-end analysis/performance technologies, to resolve problems within the TRADOC community attendant to each, and to allow service school chiefs of analysis to interact with the ORAD staff (TRADOC proponent for front-end analysis policy and training).

4. Seminar presentations are summarized herein and copies of mu-graphs, hand-outs, etc., are provided as inclusions. Unless so indicated, the content of these presentations does not necessarily reflect official TRADOC views on the subject. The intent of the seminar was to permit the service schools and invited speakers to present their opinions on varied subjects and solicit feedback to better our analysis efforts.

5. The agenda is attached as Incl 1. A list of attendees is at Incl 2.

6. Executive Summary of the Proceedings.

   a. Welcoming/Opening Remarks. MSG Mitchell opened the schedule with a brief presentation and an introduction of COL Nerone, Director, Training Developments Institute, who in turn, introduced BG Galvin, Assistant Deputy Chief of Staff for Training. BG Galvin in his official opening remarks chartered the conferees to openly discuss the problems concerning them and offered a brief overview of the current TRADOC philosophy concerning a systematic approach to training (SAT). In closing, he advised conferees that he would return on the last day of the seminar to hear, firsthand,
what they perceived to be the issues currently confronting those involved with training analysis.

b. Theme Presentation. After MSG Mitchell’s announcement of the central theme, CPT Tarr and he offered a brief explanation and comparison of the terms, "Front-End Analysis" (FEA) and "Job and Task Analysis" (JTA). Generally, JTA is perceived as a three step process of Job Analysis, Task Analysis, and Critical Task Selection; whereas, FEA (a five step process), begins with a Needs Assessment/Analysis and concludes with construction of Job Performance Measures (JPM). CPT Tarr delved a little more deeply into JPM and its relationship to training/learning objectives and the necessity to minimize variations between same in order to obtain student mastery of the specific tasks. MSG Mitchell then offered an experiential view of how to go about determining and resolving performance deficiencies and the root causes thereof (needs analysis). It was emphasized that training is not always the answer. The brevity code TINATA was "coined" for this purpose. Performance problems are caused by any one or a combination of environmental, motivational, incentive or attitudinal factors and/or training deficiencies.

c. IPISD: A Model (Dr. Robert K. Branson, Director, Center for Educational Technology, Florida State University and prime author of the Inter-service Procedures for Instructional Systems Development (IPISD)). The original goals and parameters for the ISD models were outlined by Dr. Branson. He noted that it was not designed to be a panacea for all performance or even all training problems. Particular attention was directed to its relationship to the TRADOC school model at the time of its inception.

d. ETAP: Another Look (CPT Tarr). Another look at the Extended Task Analysis Procedure (ETAP) was offered by CPT Tarr. In an audio/video presentation developed by Dr. M. David Merrill, University of Southern California (co-author under SSP contract with Dr. Charles M. Reigeluth, Syracuse University), CPT Tarr presented the applicability of the ETAP model to those skills and knowledge often generalized as "soft skills." Then, in a more direct manner, reinforced ETAP utility within the TRADOC service schools by offering supportive validation data/results. This model/technique then became the second viable model presented at this seminar.

e. SC 28, WO and Enl SQL. (MAJ Collins, SFTD, TDI) A brief overview of the current status of the SC 28 development, alignment, and implementation was offered. Discussions were held concerning the scope, acquisition method(s), and parameters of these management indicators. Limited information was provided on the WO and NCO training development additional/special skill identifiers. Conferees emphasized their desire for educational/instructional technologists rather than generalist in all ranks.

f. Analyst Training Requirements. (LTC Raymond, C, SFTD, TDI) LTC Raymond provided conferees an overview of the staff and faculty development efforts underway including the Senior Managers Course, JTA Workshop,
etc. He then solicited comments from the floor regarding the "needs" as perceived by the conferees.

g. Miscellaneous ORAD Updates (CPT Tarr, Mr. Silverberg, and MSG Mitchell), Conferees were provided data on the following topics:

(1) A Systematic Approach to Training (SAT). Conferees were advised that TRADOC had taken a more generic approach to achieving its ultimate goals of training mastery; that there were scores of techniques, models, etc., which could be employed; that a new regulation (350-XX) would be published sometime this summer; and that this regulation would regulate deliverables only—not the process.

(2) The Individual Training Plan Proposal (ITPP) program and ORAD's involvement in it was presented. Those present were cautioned to be sure they affixed properly completed Job/Task Analysis Plans whenever possible. Failing that, the specific requirements for approval were delineated. References were given to TRADOC Reg 351-4, Circular 351-3, and to TRADOC letter, ATTG-T, 20 Oct 80, dealing with common problems in ITPP submissions.

(3) The current status of TRADOC Pam 351-4(T) (JTA Handbook) and other documents, including the JTA Workshop and Job Aid (Pam 351-6), were discussed. Comments from the gathering were solicited.

(4) An update of the Life Cycle System Management Process and its relationship to individual task analysis was provided.

(5) The current efforts to interface Individual/Collective Analysis were reported on. Attendees were advised that ORAD had a representative (CPT Tarr) on the ATSC task force charged with that mission. Chiefs were asked to make the collective (ARTEP) tasks a basis of their Job Analysis efforts.

(6) Future and/or contemplated ORAD endeavors, including a proposal to bridge the gap between the service school senior managers and the analysis staffs by use of an "Executive Summary for Analysis," were offered for consideration/information.

h. A reception was held for all participants from 1800-1900, 24 Feb 81. Invited speakers, all distinguished within their fields of the Systematic Approaches to training, were introduced to participants.

i. On Wednesday, 25 Feb 81, the format switched to technologist presentations. Each invited speaker/technologist was allowed 45 minutes to present his perspective of an alternative approach to analysis. These speakers, Dr. Frances Mechner, Dr. Lyle Spencer, Dr. Joe Harless, and Dr. Roger Kaufman, offered informative, job relevant views on a particular aspect of the systems approach to training. Dr. Mechner (President of
Behavior Science Applications, Inc.) highlighted the "BSA Model" with emphasis on Steps 1-7 of the 20 step approach (see Incl 3). Dr. Spencer, Vice President, MoBer & Co., delivered a presentation on the "Job Competency Assessment (JCA) Model," being employed in a current contractual arrangement with the US Navy (see Incl 4). In his presentation he referred to an article entitled, "The New Competency Tests: Matching the Right People to the Right Jobs," from the Jan 81 issue of Psychology Today (not provided herewith due to copyright restriction). Dr. Joe Harless, President, Harless Performance Guild, Inc., followed with a summary of his Diagnostic and Planning FEA Models (Incl 5) in which he emphasized the variables between the two FEA models: diagnostic for existing online systems and planning for new or anticipated systems. Considerable time was spent examining causes of performance problems. Dr. Roger Kaufman, Director of the Center for Needs Analysis and Planning, Florida State University, concluded the presentations with his synopsis of theory concerning needs assessment (Incl 6).

j. The afternoon was spent in round robin sessions hosted by the respective technologists and members of the ORAD staff. Attendees were provided an opportunity to conduct small group discussions with the speakers in which specific queries could be addressed. The most often heard questions dealt with implementation of the various approaches in the military environment. At the conclusion of the round robin, the ORAD staff members summarized the sessions they cohosted.

k. Thursday, 26 Feb 81, started with presentations from selected service schools discussing their approach to FEA. The first presenter, MAJ Miles Nakashima, USAIS, addressed the Infantry/Review of Education and Training for Officers philosophy/procedures for Analysis. In his talk he emphasized that the USAIS had managed to utilize IPISD procedures with little or no deviation. He recognized that this was not commonly practical but had resulted in a viable analysis in their case (LTC Evans, Sill, Incl 7). CPT Sims and MAJ Rock, USAOECS, wrapped up the school presentations with a look at the recently concluded efforts of MoBer and Co., in effecting JCA in the Organizational Effectiveness Area (Incl 8). Dr. Brown of the ORAD staff then facilitated a question and answer session in which school representatives could seek out specifics, lessons learned, etc., from the school presenters.

1. Mr. Worstein, USASSC-NCR, then provided an update/overview of the Army Occupational Survey Program (AOSP) (Incl 9). This session was followed by CPT Tarr facilitating a period entitled; "Your Views on AOSP." The results of the session were lists of systemic "debuts" and "credits."

a. "DEBITS"
   
   (1) Not capable of processing classified
   (2) Too long; too many items
Excessive lead-time requirements
(4) Training criteria not used
(5) Redundancy
(6) Creditability - field input
(7) Broad scope
(8) Low return rate
(9) Scale confusion/misunderstanding

b. "CREDITS"

(1) NCR responsiveness
(2) Objectivity
(3) Empirical data base
(4) Target Population Demographics
(5) Data manipulation

No attempt was made to discuss any of the points listed above. Mr. Worstein recorded same and promised to consider the information in an effort to alleviate further systemic problems.

m. LTC Pilgrim and MSG Mitchell divided the participants into work/discussion groups for the purpose of discussing matters relevant to FEA in the service schools. Discussion Group Leaders were appointed and each was assigned a primary topic (see Incl 10). All groups were chartered to discuss the additional topics of FEA vs JTA and Systems Approach to Training (SAT). At a brief meeting with Group Leaders, all were told to arrive at topic consensus and prepare a 20-30 minute briefing highlighting that consensus (the briefings to be given to BG Galvin on Friday morning, 27 Feb 81). This program was scheduled because of repeated comments from participants at past seminars indicating a desire to present their points of view concerning the TRADOC training system. ORAD scheduled these sessions to direct communication between DCST senior officers and the service school Chiefs of Analysis. ORAD staff members monitored the discussions but did not provide input to avoid biasing discussions on Analysis problems.

n. The agenda item entitled "Analysis Data Management," was reduced to 10 minutes in order to accommodate a presentation by Ms. Alice Frappoli on the Training Development Information System (TDIS).

(1) In the Analysis Data Management segment, Mr. Silverberg led a short discussion concerning handling, storage, and retrieval of the millions of bits of analysis data being gathered in our service schools. Mr. Silverberg suggested word processing equipment be considered as a possible alternative to computerization. In short, participants were asked to consider automation of the data bank and to discuss it at an upcoming seminar or other forum (see Incl 11).
(2) Ms. Frappoli provided an overview of the current status of implementing TDIS within the TRADOC. At the time of her presentation, efforts were being made to initiate the system through the RETO effort--putting officer tasks/data into the system first. Overall milestones, system objectives, and anticipated procedures were outlined.

o. Participant topic briefings (see para 6m, above) were given to the ADCST and the Director, TDI by presenters selected by their respective groups. The following is a brief synopsis of the comments:

(1) **FEA vs JTA.** FEA is natural extension of JTA and requires additional resources. The area of needs assessment and needs analysis should have been addressed long ago. Construction of performance measures also will get more emphasis under a broadened analysis scope. It definitely should be a part of SAT (Incl 12).

(2) **SAT.** Improvement over regulatory/strict IPISD adherence. Offers more flexibility. Must be generic and provide a lot of "what" to do. Needs to eliminate some of the conflict between existing policy guidance, redundancies, and ambiguities now plaguing the system. Schools should be allowed to generalize between methods, procedures, or select the one best suiting their needs. Should become "gospel" (see Incl 13).

(3) **Models.** Sufficient commercial and/or Army prepared models available. Need guidance in "how to select best (most appropriate) model for the specific job." ORAD and/or SFTD should provide matrix or other aid to facilitate "how to select...."

(4) **Analyst Training.** The analyst training available is better than any other ISD phase training. Could use improvement/update. FEA specific training required. SC 28, WO, NCO Specialty/MOS identification MANDATORY. Generalization into SC 54 not favorable to training developers. Generalization of model training desirable. Use several alternative means of Analyst training (see Incl 14).

(5) **Data Management.** Volume of data requires some sort of system to manage it effectively. Automation/computerization is expensive - BUT NECESSARY. Special TD ADP Seminar recommended (see Incl 15).

p. BG Galvin responded to the school briefings by assuring those present that due consideration would be given to their remarks. He indicated he had been somewhat overwhelmed by their comments in that they would necessitate extensive staff research and coordination. In view of the complexity of the problems presented, he indicated he could not promise solutions but could assure those present a fair evaluation of their perspectives. COL Nerone added his remarks to those of the ADCST by rededicating the TDI to their tasks of furthering the state-of-the-art technology within the TRADOC and providing technological expertise to the service schools.
q. MSG Mitchell adjourned the seminar at 1200, 27 Feb 81, by thanking all participants, particularly General Galvin and the presenters, for their time and efforts. A challenge was rendered to all: Be prepared to be asked at some future date what you (and/or your school) has done to implement what was discussed/learned at Williamsburg. Our seminar, like any traditional training, only pays dividends when there has been transfer to job. All were asked to "take their 'stuff' home--not to leave it in Colonial Williamsburg."

DONALD L. MITCHELL
MSG
Seminar Project Officer

MARK T. PILGRIM
LTC, AR
Chief, Occupational Research and Analysis Division

19 Incl
1-15 as
16. Training West brochure
17. Article: The Cross-Training of Subject Matter Experts and Instructional Technology
INCL 1

TITLE: AGENDA
AGENDA

FIFTH CHIEFS OF ANALYSIS SEMINAR

24 - 27 FEBRUARY 1981

THEME: Alternative Approaches to Front-End Analysis - Yours and the Technologists!

SCHEDULED TOPICS: The following topics will be addressed:

- Front-End Analysis (FEA) vs. Job/Task Analysis or why we need to expand our horizons.
- IPISD: What it was meant to be - what it does.
- Extended Task Analysis Procedures (ETAP) - another look!
- Analyst training needs.
- SC 28, Warrant ASI, Enlisted SQI for Training Developers.
- Analysis Models/Techniques:
  - Those of the technology leaders and
  - Those of our schools.
- CODAP: Why, what and how - an interface with SSC.
- Management of analysis data - a look at the future.
- Miscellaneous updates:
  - A systematic approach to training (SAT).
  - The ITPP process as it relates to analysis.
  - Status of Pam 351-4(T) and other ORAD "stuff".
  - Individual/Collective Analysis Interface.
  - Future ORAD projects.
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<tr>
<th>Time</th>
<th>Event Description</th>
<th>Presenter(s)</th>
<th>Location</th>
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<tr>
<td>0700-1000</td>
<td>Registration</td>
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<td>Cascade Foyer</td>
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<tr>
<td>0800</td>
<td>Welcome</td>
<td>LTC Pilgrim, COL Nerone, BG(P) Galvin</td>
<td>Council Room</td>
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<td>0830</td>
<td>Agenda and Theme Presentation</td>
<td>MSG Don Mitchell</td>
<td>Council Room</td>
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<td>0845</td>
<td>FEA vs. JTA</td>
<td>CPT Ron Tarr, MSG Mitchell</td>
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<td>0915-0945</td>
<td>Introductory Coffee</td>
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<td>0945</td>
<td>IPISD: A model</td>
<td>Dr. Robert Branson, FSU</td>
<td>Council Room</td>
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<td>1145-1300</td>
<td>Lunch</td>
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<tr>
<td>1300</td>
<td>ETAP: Another look</td>
<td>CPT Tarr</td>
<td>Council Room</td>
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<td>1345</td>
<td>SC 28, WO ASI, Enl SQI</td>
<td>MAJ Ken Collins, SFTD(TDI)</td>
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<td>1415-1430</td>
<td>Break</td>
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<td>1430</td>
<td>Analyst training requirements</td>
<td>Dr. Larry Brown, LTC Dan Raymond</td>
<td>Council Room</td>
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<td>1530</td>
<td>Misc OR&amp;AD Updates</td>
<td>Our staff</td>
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<td>1630</td>
<td>Adjournment</td>
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<td>1800-1900</td>
<td>Reception</td>
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<td>0800</td>
<td>Agenda Review</td>
<td>MSG Mitchell</td>
<td>Cascades Room</td>
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<tr>
<td>0805</td>
<td>The BSA Model</td>
<td>Dr. Frances Mechner, Pres., Behavior Science Applic., Inc.</td>
<td>Cascades Room</td>
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<td>0845</td>
<td>Job Competency Assessment (JCA) Model</td>
<td>Lyle Spencer, Vice Pres., HoBer &amp; Co.</td>
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<td>0930</td>
<td>Break</td>
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<tr>
<td>1000</td>
<td>Diagnostic and Planning FDA</td>
<td>Joe Harless, Harless Performance Guild, Inc.</td>
<td>Cascades Room</td>
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<tr>
<td>1045</td>
<td>Needs Assessment</td>
<td>Roger Kaufman, Dir, Cen for Needs Assessment, FSU</td>
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<tr>
<td>1130</td>
<td>Round-Robin Intro</td>
<td>MSG Mitchell</td>
<td>Cascades Room</td>
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<td>1145-1300</td>
<td>Lunch</td>
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<td>1300-1600</td>
<td>Round-Robin</td>
<td>See Attachment</td>
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<td>1600</td>
<td>Round-Robin Summary</td>
<td>OR&amp;AD staff</td>
<td>Cascades Room</td>
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<tr>
<td>1630</td>
<td>Adjournment</td>
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**THURSDAY, 26 February 1981**

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<tr>
<td>0800</td>
<td>Agenda Review</td>
<td>MSG Mitchell</td>
<td>Cascades Room</td>
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<tr>
<td>0805</td>
<td>School Presentation: Inf (RETO)</td>
<td>MAJ Miles Nakashima</td>
<td>Cascades Room</td>
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<tr>
<td>0845</td>
<td>School Presentation: Field Artillery</td>
<td>LTC John Evans</td>
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<td>1000</td>
<td>School Presentation: OETC</td>
<td>CPT Ron Sims</td>
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<tr>
<td>1045</td>
<td>School Panel (Q&amp;A)</td>
<td>Dr. Larry Brown Facilitator</td>
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<td>1130-1300</td>
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<tr>
<td>1300</td>
<td>CODAP/AOSP: What, Why &amp; How</td>
<td>Dr. Darrell Worstein</td>
<td>Cascades Room</td>
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<td>1330</td>
<td>Your views on CODAP/AOSP</td>
<td>Dr. Brown Facilitator</td>
<td>Cascades Room</td>
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<td>1415</td>
<td>Break</td>
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<tr>
<td>1430</td>
<td>Your views... continued</td>
<td>Dr. Brown Facilitator</td>
<td>Cascades Room</td>
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<td>1500</td>
<td>Work Group Sessions</td>
<td>LTC Pilgrim Appointed Gp Ldrs</td>
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<td>thru 2100</td>
<td>(Optional Tour of CW)</td>
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FRIDAY, 27 February 1981

0800      Agenda Review      MSG Mitchell      Cascades Room
0805      Analysis data management      LTC Pilgrim      Cascades Room
0900      Break
0930      Briefings for ADCST/Dir, TDI      TO BE ANNOUNCED      Cascades Room
1200      Wrap-Up/Adjournment      MSG Mitchell      LTC Pilgrim      Cascades Room

HAVE A SAFE JOURNEY HOME!
**ROUND-ROBIN SCHEDULE**

During the round-robin sessions with the technologists, please follow the below schedule.

**REMEMBER: SESSIONS LAST 30 MINUTES!**

<table>
<thead>
<tr>
<th>Time</th>
<th>echner Council 1</th>
<th>Spencer Council 2</th>
<th>Harless Cascade 1</th>
<th>Kaufman Cascade 2</th>
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<td>SSC</td>
<td>LOGC</td>
<td>CAC</td>
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<td>CAC</td>
<td>Misc.</td>
<td>SSC</td>
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There will be 15 minute breaks between all sessions.

1600 **SUMMARY:** Cascade I and II

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![Floor Plan](image-url)
TITLE: ATTENDEES
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<tr>
<th>NAME</th>
<th>GRADE</th>
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<tr>
<td>Aigarter Garth E.</td>
<td>SFC</td>
<td>NCOIC Analysis Branch</td>
<td>USAAS, ATTN: DTO, Ft Bliss, TX 79916 TEL: AV 987-7739</td>
</tr>
<tr>
<td>Belanus Terry</td>
<td>CPT</td>
<td>Proj Off</td>
<td>Army Trng Bd, USATSC, ATTN: ATTC-ATB-TA, Ft Eustis, VA 23604 TEL: AV 927-4658</td>
</tr>
<tr>
<td>Bergman Joseph A.</td>
<td>GS-12</td>
<td>Occ Psych</td>
<td>AHS, ATTN: HSA-TIA, Ft Sam Houston, TX 78234 TEL: AV 471-3144/5949</td>
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<tr>
<td>Brady John B.</td>
<td>GS-12</td>
<td>C, Qual Ctl, Enl Tng Div</td>
<td>USASAC, ATTN: ATSG-TD-E, Ft Benjamin Harrison, IN 46216 TEL: AV 699-4311</td>
</tr>
<tr>
<td>Brittain Clay V.</td>
<td>GS-14</td>
<td>QRSA</td>
<td>USAFTC, ATTN: ATTS-SM-SE, Ft Eustis, VA 23604 TEL: AV 927-5332</td>
</tr>
<tr>
<td>Burk Garry A.</td>
<td>SFC</td>
<td>C, Res Tng</td>
<td>USA SCH OF MUSIC, ATTN: ATTN-TG-DTD, Little Creek, VA 23521 TEL: AV 680-3211</td>
</tr>
<tr>
<td>Chippendale Joan T.</td>
<td>GS-11</td>
<td>Educ Spec</td>
<td>OFF TNG SYS DIV, TNG DEV INST, Ft Monroe, VA 23651 TEL: AV 680-3211</td>
</tr>
<tr>
<td>Cooper Clarence C.</td>
<td>MAJ</td>
<td>C, Off Tng Br</td>
<td>AHS, ATTN: HSA-TII, Ft Sam Houston, TX 78234 TEL: AV 471-5335/5271</td>
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<tr>
<td>Collins Kenneth R.</td>
<td>MAJ</td>
<td>Staff Off</td>
<td>STF&amp;FAC TNG DIV, TNG DEV INST, Ft Monroe, VA 23651 TEL: AV 680-4260</td>
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<td>Craig, James M.</td>
<td>LTC</td>
<td>Dep Dir, Tng Dev</td>
<td>USA CHAP SCH, ATTN: ATSC-TD-O, Ft Monmouth, NJ 07703 TEL: AV 992-3613/3742</td>
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<tr>
<td>Delton, William F.</td>
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TEL: AV 687-4168

US NAVY SP SVC ACT, ATTN: UIC 66133, Patuxent NAS, MD 20670
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INCL 3

TITLE: THE BSA PROCESS

FOR DEVELOPING LARGE-SCALE TRAINING SYSTEMS
THE BSA PROCESS FOR DEVELOPING
LARGE-SCALE TRAINING SYSTEMS

Presentation made on February 25, 1981
to the Chiefs of Analysis Seminar of the
Department of the Army's
Training Development Institute

by

Francis Mechner, Ph.D.
Behavioral Science Applications, Inc.
1501 Broadway
New York, N.Y. 10036
HISTORIC ORIGINS OF BSA'S PROCESS FOR THE DEVELOPMENT OF LARGE-SCALE TRAINING SYSTEMS

During the period from 1960 to 1965, prior to its acquisition by Xerox, Basic Systems Inc., Dr. Mechner's firm, tried to create an efficient, economical, and manageable industrial production process that would reliably produce high quality training systems responsive to clients' requirements. Since Basic Systems was a commercial operation, this production process had to operate within pre-specified time frames and budgets, and had to be sufficiently well methodized to allow it to be carried out by individuals who were neither psychologists nor experts in the subject matter areas involved.

Basic Systems attempted to develop a production process designed to meet these requirements. The process was gradually improved over the four-year period from 1961 to 1965. Other organizations adopted this process and modified it to meet their own requirements. AT&T, for example, developed a set of "standards" for the phases of the process and for the documentation to be produced at the termination of each phase.

In 1973, Dr. Mechner was asked to transfer the knowhow for producing large-scale training systems technology to Brazil, where manpower development is a major problem. The transfer of the technology was to be accomplished through a series of manpower development projects to be carried out by Brazilians under Dr. Mechner's direction. A
Brazilian corporation, EDUTEC, was organized for this purpose, and since that time hundreds of large-scale performance systems have been developed in such diverse areas as the training of operators of mini-computers, personnel who install and maintain various kinds of equipment, airline ticket agents, sales personnel, auditors, financial analysts, supervisors, physicians to serve as directors of health service centers, gas company servicemen, and professors of administration. In all cases emphasis was placed on producing the desired performance in the job, with training constituting a part of the system that achieves this goal.

In order to accomplish the task of implementing an effective production process for the development of large-scale performance systems in Brazil, it was necessary to carry the methodization of the process beyond the level to which Basic Systems had taken it.

This new, more advanced production process makes it possible to produce higher quality performance systems at lower cost, and with greater efficiency than Basic Systems was ever able to do. The process is also the only one in existence that was developed and honed continuously, over a period of years, through practical use and application.

Dr. Mochner has continued to improve the process to the present day, with a view to making it more efficient, more economical, easier to manage, and easier to learn. His most recent work on the process has been done under contracts with the U.S. Army Training Development Institute and the Army Research Institute.
BSA'S 20-STEP PROCESS FOR DEVELOPING LARGE-SCALE TRAINING SYSTEMS

The 20-step process for the development of performance systems described below was developed by Francis Mechner's organization.

The process is based upon and related to training systems development processes used previously. It differs from these in that (a) it places greater emphasis on installing the desired performance in the real field situation, as opposed to merely producing high scores on tests, (b) task analysis is done in a more sophisticated and effective way, (c) the process is broken down and methodized into smaller discrete production steps, (d) there is more emphasis on behavioral analysis which is separated out as a discrete step of the process, (e) several other important tasks that have usually been buried in other phases or overlooked altogether are separated out as discrete steps of the process, and (f) equal emphasis is placed upon the "how to" or operational aspect of carrying out each step of the process, and the final documentation or end product of each step.

The steps were selected and defined with several criteria in mind: (a) Each step has applicability and a place in all or almost all performance systems development projects regardless of subject matter area or target population; (b) Each step defines as restricted and narrowly-defined a task as possible, consistent with the steps still being large and significant enough to justify their being carried out in a specific sequence, and consistent with the activities required by the steps not overlapping in consecutive steps.
The benefits of the 20-step methodization that was arrived at are several. First, each step is so simple to execute that a non-psychologist who may also be unversed in the subject matter of the training system can be brought into the project at any step of the 20-step process and become productive in a short time.

Second, the completion of each step provides a meaningful check point at which the project manager, client, or subject matter expert can evaluate and control the progress of the work. Third, the procedures defined by the steps allow efficient use to be made of the time of outside subject matter experts whose knowledge is to be transferred, via the training system, to the trainees in the system's target population. The subject matter experts are able to make their contributions without actually participating in the writing or production process.

This 20-step production process has been used for the development of many training systems during the past eight years, in many widely different areas, ranging from the training of physicians to become managers of health service centers at one extreme of the educational range, to the training of semi-illiterates to become equipment installers, and clerk-typists to become mini-computer operators at the other extreme. In the course of the experience gained with these many projects, the 20-step process has been continuously improved and refined.
OUTLINE OF THE 20-STEP PROCESS

1. Project analysis -- Preliminary studies and analyses; proposal.
2. Project manual -- To be updated and maintained throughout project.
3. Gross task analysis -- Job analysis or analysis of duties
4. Task analysis -- Development of job performance specifications
5. Performance evaluation procedures -- Development of evaluation items.
6. Validation of performance evaluation items -- Target population test.
8. Production of examples and cases -- Scripts, episodes, etc.
9. Final review of prerequisites -- Additional pre-requ's are included
10. Final specification of media -- Specified on an item-by-item basis.
11. Performance system plan -- Specification of sequences, types of activities to be used, check points, management plan, evaluation methods to be used, equipment, logistics, etc.
12. Physical specification of the system -- Amount of each type of material such as pages, tapes, booklets, etc.
13. Development of first complete usable version of the system.
14. Test of first version -- on a small group of target population members.
15. Analysis of data from the first test -- Results are used to diagnose problems in the first version.
16. Development of second version of the complete system
17. Test of second version -- on another small group of target population.
18. Analysis of data from the second test -- To diagnose remaining problems.
19. Production of the final version of the system
20. Large-scale installation and implementation.
SELECTED TOPICS TO BE DISCUSSED

1. The most important function of the task analyst -- to figure out what constitutes competent task performance. The behavioral components that remain invisible during task performance are usually the most important ones. How does the man reason? On what basis does he make his decisions and judgments? What plausible mistakes does he avoid? The task analyst must learn these things by skilled investigative techniques.

2. The end-point of the task analysis process -- How does the task analyst know when to stop breaking down tasks into smaller units? When he has a task that meets each of five criteria. The first of these five criteria is that it is a unit of performance that is performed repeatedly, each time more or less the same way, and often in different circumstances and situations. The second criterion is that the unit of performance has a specified and measurable result when done correctly.

3. The output of the task analysis step -- The purpose of the output documents of task analysis is to provide the designers (Phase 2 of the ISD process) with the information they need. The essential output document is the Task Performance Specification. It describes task performance in the real work situation. It must include the conditions under which the task is performed, if must describe the behavior involved and provide examples of it, it must specify the desired results or outcomes of the behavior, and the criteria that would be applied in determining whether the results or outcomes have been achieved.
4. The distinction between Task Performance Specifications and Performance Evaluation Procedures -- TPS's are the end-product of Task Analysis and specify task performance under real field conditions; Performance Evaluation Procedures are a product of the Design Phase and specify the behavior and performance that will called for and measured in the training and test setting. The training and test conditions simulate the real field conditions as closely as is practical, but they are not identical to the real field conditions.

5. Behavioral Analysis -- the second half of the Design Phase. The input documents for Behavioral Analysis are the TPS's and the PEP's. The end product of Behavioral Analysis is the specification of the training materials to be developed in the Develop Phase. The Behavioral Analysis document tells the developer how to teach each task, what kinds of cases, examples, and problems to use, what responses to call for for each instructional item, item sequences, and instructional media to use.
TITLE: JOB COMPETENCY ASSESSMENT (JCA)

IDENTIFYING, MEASURING, AND TRAINING "SOFT SKILL" COMPETENCIES WHICH PREDICT PERFORMANCE IN PROFESSIONAL, MANAGERIAL, AND HUMAN SERVICE JOBS
JOB COMPETENCY ASSESSMENT (JCA)

A FRONT-END ANALYSIS METHOD TO IDENTIFY

"SOFT SKILLS" THAT PREDICT SUPERIOR PERFORMANCE IN
PROFESSIONAL AND MANAGERIAL JOBS

Now used in Army

(1) ORGANIZATIONAL EFFECTIVENESS STAFF OFFICERS (OESOs)
OEC&S, Ft. Ord

(2) JUNIOR OFFICERS
ARI

(3) ARMY CHAPLAIN SCHOOL
Ft. Monmouth
PROBLEM

Increasing evidence that traditional assessment methods based on knowledge content--

0 grades
0 test scores
0 interviews--

(1) do not predict job behavior or results;

(2) are discriminatory: race, sex, cultural background;

(3) are boring to adults.
COMPETENCY

EMPIRICALLY MEASURABLE
* MOTIVE
* TRAIT
* SELF-CONCEPT
* KNOWLEDGE
* SKILL

THAT CAN BE SHOWN TO CAUSE OR PREDICT EFFECTIVE OR SUPERIOR PERFORMANCE IN A GIVEN JOB
COMPARISON OF JOB TASK ANALYSIS
AND JOB COMPETENCE ASSESSMENT

<table>
<thead>
<tr>
<th>JOB TASK/FUNCTIONS</th>
<th>JOB COMPETENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elements of Job</strong></td>
<td><strong>Characteristics of Person Who Does Job Well</strong></td>
</tr>
<tr>
<td>E.g., Administrative paperwork</td>
<td>Logical thought: Arrays things in hierarchical (priority) or temporal (&quot;PERT&quot;) sequences</td>
</tr>
<tr>
<td></td>
<td>Delegation</td>
</tr>
<tr>
<td></td>
<td>Monitoring</td>
</tr>
</tbody>
</table>

**Training Implication**

<table>
<thead>
<tr>
<th>Detailed instruction and practice in filling out/processing job-specific form</th>
<th>Understand/practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Logical thought</td>
</tr>
<tr>
<td>2.</td>
<td>Delegation</td>
</tr>
<tr>
<td>3.</td>
<td>Monitoring</td>
</tr>
<tr>
<td>Etc.</td>
<td>In many varied cases (including specific job):</td>
</tr>
<tr>
<td></td>
<td>Hospital pathology lab</td>
</tr>
<tr>
<td></td>
<td>Tactical nuclear-weapons depot</td>
</tr>
<tr>
<td></td>
<td>Washington staff agency</td>
</tr>
</tbody>
</table>

I.e., Teach specific job skill—Best for "micro" technical tasks—Trouble-shoot radio

I.e., Teach underlying generic causal skill—Best for "higher-level" professional and managerial jobs—E.g., lawyer
**LOWER-LEVEL ENLISTED GENERIC COMPETENCIES**

<table>
<thead>
<tr>
<th>JOB TASK/FUNCTIONS</th>
<th>JOB COMPETENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Clean chapel/motor pool</td>
<td>0 Attention to detail</td>
</tr>
<tr>
<td>0 Type memos</td>
<td>0 Proactivity in advancing career</td>
</tr>
<tr>
<td></td>
<td>-- Persists (innovatively) when blocked</td>
</tr>
<tr>
<td></td>
<td>-- Makes productive use of &quot;doing nothing&quot; time</td>
</tr>
<tr>
<td></td>
<td>0 Conflict-resolution skills with boss</td>
</tr>
</tbody>
</table>

**TRAINING IMPLICATION**

<table>
<thead>
<tr>
<th>JOB TASK/FUNCTIONS</th>
<th>JOB COMPETENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Attention to detail</td>
<td>(1) Comic picture: How many things can you find wrong?</td>
</tr>
<tr>
<td></td>
<td>(2) Memo with typos</td>
</tr>
<tr>
<td></td>
<td>(3) Dirty chapel/motor pool</td>
</tr>
<tr>
<td></td>
<td>(4) Conflicting schedule</td>
</tr>
<tr>
<td>0 Productivity</td>
<td>(1) Career maze game with blocks</td>
</tr>
<tr>
<td></td>
<td>(2) &quot;Hour Alone&quot;: How many ways can you use it?</td>
</tr>
<tr>
<td>0 Conflict resolution</td>
<td>Role-play real incidents</td>
</tr>
</tbody>
</table>
## STABLE (CAUSAL) COMPETENCIES OF PEOPLE vs. TEMPORARY SKILL DEMANDS OF JOBS

<table>
<thead>
<tr>
<th>Environment</th>
<th>Person</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SITUATIONAL (JOB) DEMAND</strong></td>
<td><strong>IMPULSE</strong></td>
</tr>
<tr>
<td>● Getting mugged</td>
<td>● &quot;I'm angry&quot;</td>
</tr>
<tr>
<td>● Job instruction: &quot;This is the right way to do this task&quot;</td>
<td>● &quot;I want to do well on this task&quot;</td>
</tr>
<tr>
<td><strong>ORGANIZATIONAL/STRUCTURE INCENTIVES</strong></td>
<td><strong>MOTIVE DISPOSITIONS</strong></td>
</tr>
<tr>
<td>● Sustained combat, confrontive politics</td>
<td>● Aggression (fighter pilots): &quot;I'm always looking for a fight&quot;</td>
</tr>
<tr>
<td>● Challenge, rewards for excellent performance</td>
<td>● Achievement motivation: &quot;I'm a chronic perfectionist&quot;</td>
</tr>
</tbody>
</table>

**JOB TASK ANALYSIS**

**STABLE**

**TEMPORARY**

**JOB COMPETENCE ASSESSMENT**
The Job Competency Assessment Process

Objective: increase assessment and training efficiency by empirically identifying characteristics of people who do jobs well

Process: Define

1. Performance Effectiveness Criteria
   - "Hard data": sales, profits, productivity measures, unit performance records (e.g., ARBEP scores, retention rates)
   - supervisor nominations
   - peer ratings
   - subordinate ratings (as by organizational climate surveys)

2. Criterion Sample
   - superior performers
   - average performers

G. Job Task/Function Analysis
   - elements of the job people are required to perform

4. Performance Characteristics Analysis
   - hypotheses about characteristics of people who do the job well

5. Direct Observation
   - coding of observed behaviors

G. Thematic Analysis: Development of Competency Model
   - development of "Behavioral Codebook" describing competencies

3. Validation of Competency Model
   - interviews, tests (second criterion sample)

Application of Competency Model

- selection
- training for job
- professional development while in job
- performance appraisal
- evaluation of training, professional development, etc., progress
COMPARISON OF JOB ANALYSIS METHODS

1. Content Knowledge/“Theory”

2. Expert Panels:
   - No data - doesn't predict
   - Folklore, “Motherhood” items
   - Not specific: e.g., “Concern for people”

3. Job Task Analysis
   - Job, not best people: e.g., “Contract with clients”
   - Too detailed
   - Not selective: 80/20 rule

4. Competency Assessment
   - People who do job well: Predictive
   - Specific measurement, training of soft skills
   - Selective: Key causally-related “Transfer” skills which predict ability to learn other skills
MEASURING COMPETENCIES

- Tests
- Ratings
- "Assessment Center"
  EMPIRICAL CODING OF BEHAVIOR

OPERANT

VS.

RESPONDENT
TRAINING COMPETENCIES

1. Recognition: Importance of skill to job functions
2. Understanding: Learn scoring system
3. Self-assessment: Self vs. superstar
4. Skill practice: To criteria
5. Job application: Goal setting - action planning
SUMMARY POINTS

Competency Assessment

* COMPATIBLE WITH ISD

* ESPECIALLY USEFUL WITH "SOFT SKILLS" IN HIGHER LEVEL JOBS: LEADERS, MANAGERS, HUMAN SERVICE PROFESSIONALS

* TRAINING IN CAUSALLY-RELATED "TRANSFER" COMPETENCIES MORE EFFECTIVE
  - WHAT PEOPLE WILL DO VS.
  - SKILLS TRAINING ALONE: WHAT PEOPLE CAN DO
IDENTIFYING, MEASURING, AND TRAINING "SOFT SKILL" COMPETENCIES WHICH PREDICT PERFORMANCE IN PROFESSIONAL, MANAGERIAL, AND HUMAN SERVICE JOBS

Lyle M. Spencer, Ph.D
McBer and Company

A paper presented at the Soft Skill Analysis Symposium, Department of the Army Training Development Institute, Fort Monroe, Virginia, 15 August 1979.

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Introduction

This paper will describe a new personnel procedure, Job Competence Assessment (JCA), which has been successfully used to identify "soft skill" competencies which predict performance in professional, managerial, and human service jobs.

I can best introduce the Job Competence Assessment method by providing an example from one of the seminal projects in which it was used.

In the early 1970s, McBer and Company was approached by the United States State Department for assistance in selecting and assessing the performance of Junior Foreign Service Officers (FSOs). Traditionally, the State Department had selected Foreign Service Officers through the use of a Foreign Service Officer exam. This exam was based on the hypothesis of senior statesmen officials that the skills required for effective performance as a modern diplomat were essentially "liberal arts" knowledge and culture: American history, Western civilization, verbal fluency, and such specialties as economics and government. Typical items on this exam presented an aspiring FSO with a line of Greek poetry, followed by a multiple choice question as to the line's author: Aeschylus, Sophocles, Euripides, Aristophanes.

This exam had two principal drawbacks. First, it was quite discriminatory: Minorities and others from less privileged, "cultured" backgrounds were much less likely to pass it. Second, and more importantly, performance on this test not only did not predict performance as a Foreign Service Officer, but scores were actually negatively correlated with ratings of on-the-job performance (McClelland & Dailey, 1973).

McBer was asked to develop a methodology to answer the obvious question: If verbal fluency and cultural content knowledge do not predict FSO performance, what skills and competencies do? The Job Competence Assessment methodology used to answer this question consisted of the following steps.

First, the State Department was asked to identify, through a variety of techniques (including supervisory, peer, and client nominations and ratings) one criterion sample of its best Junior FSOs and another of average FSOs.

Second, superior and average performers were interviewed using an in-depth "Behavioral Event Interview" (BEI) technique. This method, developed by Harvard University psychology Professor David C. McClelland and colleagues at McBer and Company (McClelland, 1976) is derived from Planagan's (1954) classic Critical Incident Method.
It asks interviewees to identify the most critical situations they have encountered on their jobs and describe these situations in considerable narrative detail: What led up to the situation? Who was involved? What did the interviewee think about, feel, and want to accomplish in dealing with the situation? What did he or she actually do? What was the outcome of the incident? McClelland's method goes beyond Flanagan's, however, in that it includes thematic apperception test probes which elicit data about the interviewee's personality and cognitive style (e.g., achievement motivation or convergent thinking ability).

Third, interview protocols were content analyzed to identify characteristics and behaviors which distinguished superior from average job incumbents.

Fourth, hypotheses about competencies which discriminated superior from average performers were tested in two types of cross-validation designs. Additional interviews were conducted with a second set of superior and average job incumbents. These interviews were empirically coded for elements which distinguished the two groups in the first criterion sample. (Empirical coding of interviews can be done with high interrater reliability, \( r_s = 0.80 - 0.90 \), providing quantitative data that can be used in standard statistical tests of significance.) Objective tests were then developed to measure the presence of competencies causally related to the behaviors reported in the behavioral event interviews. Discriminate function analysis techniques were used to see how well interview and test variables derived from the competency model, based on the first criterion sample, predicted classification of superior versus average performance in the second validation sample.

The findings of the State Department study were very interesting. The types of competencies which discriminated superior from average Foreign Service Officers were such soft skills as:

- **nonverbal empathy**: the ability to "hear" what a person from a foreign culture was really saying or meaning in a negotiation;

- **a skill we wound up calling "speed in learning political networks,"** the ability to very quickly figure out in a foreign capital that it was the Prime Minister's executive assistant's mistress' nephew that really called the shots in a particular area of foreign policy—and how to get to this nephew; and

- **positive expectations**, or what Rosenthal (1976) calls "the Pygmalion effect": a strong belief in the underlying dignity and worth of others different from oneself, and the ability to maintain this positive outlook under stress.
These and other nontraditional "soft skill" competencies did demonstrate criterion validity in predicting Foreign Service Officer performance at statistical levels of significance and proved not to be discriminatory on racial, sexual, or SES background bases.

This Job Competence Assessment process has now been used to identify the "soft skills" which predict performance in more than 50 professions, from manufacturing managers and computer design engineers in high technology industries, to paraprofessional human service workers in New York City, to United States naval officers.

The Job Competence Assessment Process

The Job Competence Assessment process has since been elaborated to include some of the job task/function analysis techniques prescribed in the DOD's ISD model, and the job element analysis methods developed by civil service researchers (Primoff, 1977). The present process remains, however, based on the assumption that the best way to identify the knowledge, skills, or other abilities needed to perform competently in a job is (1) to identify the most effective performers in that job; (2) study what these people actually do that distinguishes them from individuals whose performance is less satisfactory; and (3) identify the specific skills, abilities, or characteristics which are responsible for this difference.

The current Job Competence Assessment process, now being used to identify competencies of effective Army Organizational Effectiveness Staff Officers, consists of eight steps (see Figure 1).

1) Define Performance Effectiveness Criteria

To identify superior job incumbents, it is first necessary to define measures of performance effectiveness in a given job. Ideal criteria are "hard" outcome measures, such as sales or profits data in industry, or unit performance outcomes, such as ARTEM scores or retention rates, for military officers. In the absence of such criteria, supervisor nominations and peer ratings can be used. (Recent reviews by Lewin and Zwany, 1976, and Kane and Lawler, 1979, indicate that these ratings have high criterion validity.) Supervisory and peer ratings can in some cases be supplemented with client or subordinate ratings (e.g., those available from organizational climate surveys).

2) Identify Criterion Sample

Job incumbents who are consistently rated superior on a number of different performance criteria provide a standard for comparison analyses with a sample of average performers in the remaining steps of the process.
FIGURE 1
Schematic of the Job Competency Assessment Process

Define

Performance Effectiveness Criteria

Identify

Criterion Sample

Job Task/Function Analysis

Behavioral Event Interviews

Performance Characteristics Analysis

Direct Observation

Thematic Analysis: Development of Competency Model

Validation of Competency Model

Application of Competency Model

- "hard data": sales, profits, productivity measures, unit performance records (e.g., ARTEP scores, retention rates)
- supervisor nominations
- peer ratings
- subordinate ratings (as by organizational climate surveys)

- superior performers
- average performers

- elements of the job people are required to perform
- hypotheses about characteristics of people who do the job well
- coding of observed behaviors

- development of "Behavioral Codebook" describing competencies

- interviews
- tests

second criterion sample

- selection
- training for job
- professional development while in job
- performance appraisal
- evaluation of training, professional development, etc., programs
(3) **Job Task/Function Analysis**

A job task or function analysis by traditional time-log, panel, or direct observation methods can be used to supplement the data collected in the Job Competence Assessment process, although for reasons which will be discussed below, this method is less useful in identifying critical "soft skills" competencies, because job task analyses identify the characteristics of the job as opposed to those of the people who do the job well.

(4) **Performance Characteristics Analysis**

A panel of expert incumbents or observers of the job to be analyzed is convened to develop a list of hypothesized characteristics of people who do the job well (cf. the "Job Element Analysis" method developed by Primoff, 1977). Expert panels then rate each characteristic on four scales:

1. the extent to which it distinguishes superior from average performers;
2. how many barely acceptable performers possess it;
3. how critical it is for selection or training; and
4. how many job openings one could realistically expect to fill if one demanded the characteristic or skill as an entry criteria.

Statistical analysis of these ratings provides a numerical ranking of those characteristics which contribute most highly to superior performance and elimination of those which are unrealistic or appear to be possessed by few job incumbents. This analysis provides a set of hypotheses about critical performer competencies which must be verified by behavioral event interview or direct observation data.

(5) **Behavioral Event Interview**

As described in the Foreign Service Officer example, superior and average performers are interviewed in-depth about the most critical situations they have encountered and hence, the most important skills and competencies required of them in their actual jobs. Behavioral event interview protocols provide a wealth of data...

---

1 An element will be rated highly (1) if it distinguishes the superior performer; (2) if very few barely acceptable performers have it; (3) if trouble is likely if it is not considered in selection or training; and (4) if it is realistic to fill at least some jobs by demanding it. Conversely, an element will receive a low rating (1) if it does not distinguish the superior performer; (2) if almost all barely acceptable performers possess it; (3) if one can safely ignore it in selection and training; and (4) if all jobs can be filled by demanding it. (See equations in Primoff, 1977.)
for the identification of "soft skill" competencies and a very specific description of job behaviors. (A significant "by-product" of these interviews is the generation of numerous situation and problem narratives which can be used to develop highly relevant training materials—e.g., case studies and simulations.)

(6) **Direct Observation**

Where possible, direct observation can be used to verify job task analysis, performance characteristics, hypotheses, and behavioral event interview data. As will be discussed below, empirical "assessment center" behavioral coding schemes (Bales, 1969; Bales, Cohen, & Williamson, 1979) provide perhaps the most valid method of measuring soft skill competencies.

(7) **Thematic Analysis and Development of a "Competency Model"**

Data from the job task performance characteristic analysis and behavioral event interviews are subjected to a rigorous content analysis procedure to identify the behavioral patterns and personality characteristics which distinguish superior from average job incumbents. This is the most difficult and creative step in the JCA process. Two or more trained analysts examine the data and attempt to define competency elements which are differentially present or absent in the data on superior as compared with average performers. These elements are refined until they can be recognized with acceptable inter-rater reliability. A detailed and specific "behavioral code book" is prepared to facilitate empirical coding of interview data. These data are then used to test the criterion validity of the model. The behavioral code book, which describes the soft skill competencies that predict performance in the job, provides the "competency model" for the job.

(8) **Validation of the Competency Model**

As described in the Foreign Service Officer example, the competency model derived in Step 7 can be cross-validated by (1) collecting behavioral event interview data on a second criterion sample and seeing if a discriminant functions analysis based on the first study predicts successful as opposed to average performers in the second sample; and/or (2) constructing objective tests to measure the competencies derived from the competency model and using test scores from a second criterion sample to test the model's criterion and predictive validity.
Application of the Competency Model

Once validated, the competency model can be used in a variety of ways: as the basis for the design of selection tests, assessment centers, performance appraisal systems and training and professional development programs, and as a source of criteria for the evaluation of training programs.

Comparison of Job Competence Assessment With Other Job Analysis Methods

It is useful to examine how the Job Competence Assessment method differs from and can address some of the limitations in traditional job analysis techniques. Three traditional approaches to defining selection and training criteria can be distinguished:

1. **Content Knowledge or Theory-Based Systems** which specify, on the basis of theory, the knowledge skills which should be important for a person to have in order to do a job.

2. **Expert Panel**: the characteristics which experts, tasked to determine by consensus, think are important for a person to have in order to do the job (represented in the Job Competence Assessment process by the performance characteristics analysis step).

3. **Job Task/Function Analysis**: identification of the task functions that make up the job which are used to infer the knowledge and skills needed by the people who occupy the job.

Theory and panel methods have three distinct limitations. First, they lack supporting empirical data to show that the knowledge or skill characteristics they posit are in fact related to on-the-job performance. An example was the humanistic psychology courses which swept the military a few years back: Civilian academic management theories and strongly-held beliefs on the part of a few persons led to the implementation of "leadership" courses, which taught and prescribed "humanistic" communications techniques in the absence of any data to show that these techniques had in fact anything to do with effective leadership in military organizations.

Second, theory and panel methods tend to identify so-called "folklore" or "motherhood" items (such as "integrity," "perseverance" or "moral courage") which sound good and are seen as qualities that all job incumbents should have, but which may or may not be related to performance on the job. For example, in the State Department study, "writing skills" was agreed upon as necessary for superior performance of Foreign Service Officers. The
Job Competence Assessment process found that despite the fact that "everyone knew" that writing skills were important, this ability did not in fact differentiate superior from average performers. What was important was the ability to write with sensitivity to political issues.

The third shortcoming of theory and panels is that the data they generate are not sufficiently behaviorally specific to provide practical selection or training criteria. For example, it is difficult to define "concern for people" in observable terms. How does one manifest concern? What does this mean? It turns out that what has usually been identified as "concern for people," affiliation motivation, or the desire to establish close friendly relations with others has consistently been found to be negatively related to effective performance in managerial roles (McClelland & Burnham, 1976). Effective concern for people, at least for industrial and military leaders, is not a function of affiliation needs, but rather the combination of a skill called accurate empathy (the ability to understand what others are saying) and power or influence skills (the ability to empower others to make them feel more capable of solving their own problems).

Job tasks/function analysis methods also have limited utility in identifying soft skills. The unit of analysis is the job, not the person who performs the job well. For example, a job task analysis statement for a mechanical engineer might be "designs gears." This is accurate enough but says nothing about what enables an engineer to design a gear well. Behavioral event interviews with superior engineers indicate that they have an underlying competency which might be labeled "three dimensional eidetic rotational imagery." For example, in behavioral event interviews, better engineers described an ability to mentally "image" and mutate physical objects in three dimensions, imaging different configurations until they arrive at an optimum design. Some even reported bringing other senses into play as well (e.g., "I sort of became the gear and tried to feel where I would hurt or break if under stress--sounds crazy, but it led me to 'seeing' the need to thicken a flange..."). This cognitive competency did not appear in average engineers' interview protocols. Similarly, in studies of Army Organizational Effectiveness Staff Officers (internal organizational development consultants), an important job function appeared to be "contracting with clients" (i.e., negotiating with the service recipient to agree on just what services the consultant would provide). This functional statement, however, does not specify what consultant skills lead to effective contracting. All consultants contract, but only some do it well. A key soft skill competency in this case proved to be "accurate empathy": more effective consultants were better able to "hear" their clients' underlying concerns.

In each case, job task analysis methods can identify what people do, but not the nuances of professional skill that enable some persons to perform a task more effectively than others. Lists of tasks,
such as "writes memos" or "communicates orally to subordinates," are of little use without supplementary information about the competencies a superior job incumbent uses to make these communications effective (e.g., accurate empathy, political sensitivity, or such influence methods as assertive persuasion).

Second, job task analyses tend to be too detailed to be practical (e.g., lists of the 4,300 discrete behaviors required in driving a car or the 3,001 functions performed by a teacher). Such analyses may be useful for describing specific technical tasks (for example, the steps in trouble-shooting a radio), but provide too much information in the wrong form to be helpful in teaching soft skills.

Finally, job task analyses are not selective. The well-known Praetor rule indicates that only a critical 20 percent of the functions a person performs on the job account for 80 percent of performance. The remaining 80 percent of all job functions are routine maintenance activities which do not distinguish successful from average performers. Job tasks/function analysis lists, particularly in the absence of a criterion sample, can not distinguish the important functions from all the functions that a job incumbent performs.

The Job Competence Assessment method overcomes some of the limitations of theory, panel, and job task analysis techniques and can supplement them in the identification of critical soft skills. First and most importantly, the JCA method goes beyond espoused theories and job descriptions to identify the personal characteristics and skills important to effective performance of specific job functions.

Second, the behavioral event interview makes it possible to document these soft skill competencies with sufficient behavioral specifics that they can be used to assess and train others.

Third, the JCA method is selective. The critical incident interview approach necessarily focuses on the "critical 20 percent" of knowledges, skills, abilities, and other characteristics most important to performance as opposed to the large number of ancillary behaviors associated with routine functions.

Application of Job Competence Assessment Methods to Measuring and Training Soft Skills

It may be useful to briefly describe some of the methods developed from the Job Competence Assessment procedure for measuring and training to soft skills.
Measuring Soft Skills

There are three commonly used "soft skill" assessment methods:

(1) **Paper-and-pencil tests** of knowledge content, cognitive ability (e.g., critical thinking or decision making), and personality variables (e.g., attention to detail and concern for influence). In general, operant tests (e.g., essay exams or projective instruments), which require test-takers to generate behavior, are more useful than respondent measures (e.g., multiple choice exams) which ask test-takers to choose among items. Reviews suggest the criterion validity of multiple-choice tests rarely exceeds $r = .33$ or 10 percent of the observable variance (Ghiselli, 1966; Mischel, 1968).

(2) **Superior and/or peer ratings** of job incumbents on the basis of general performance or aptitude for a job. Recent reviews indicate the criterion validity of such ratings is somewhat better than that of paper-and-pencil tests: $r = .40 - .45$ or 16 - 20 percent of the variance (Lewin & Zwany, 1976; Kane & Lawler, 1979).

(3) **Observer ratings of performance on simulated job-specific tasks** (e.g., ratings of military officer performance in such assessment center exercises as giving a presentation or managing a leaderless group). Reviews of the predictive validity of assessor scores is better still: $r = .50 - .60$ or 25 - 30 percent of the variance (MacKinnon, 1975).

Our research indicates that operant tests are much more effective in measuring soft skills than are respondent knowledge content tests. For example, in assessing influence skills, it is much better to measure individuals' ability to make an effective argument (an operant performance) as opposed to their ability to recognize an effective argument on a multiple-choice test. In general, simulated job performance tests are more predictive than operant paper-and-pencil tests.

Very frequently, the operant test items or situations and test scoring criteria for specific soft skill competencies can be derived from behavioral event interview data and the behavioral code book which describes the competency model for a job. A better score on such tests is what superior performers actually do as opposed to what average performers do. Two examples from the Navy officer competency model may be helpful here.

Figure 2 provides examples from an operant coding system for critical thinking, the cognitive ability to make inferences or draw critical distinctions from large amounts of confusing, conflicting data, and cite specific data to support one's inference.
FIGURE 2

Example from an Operant Coding System for "Critical Thinking" (from Winter & McClelland, 1978)

Procedure: a subject is asked to compare and contrast two conflicting analyses of or statements about a stimulus or set of data

Coding System for scoring subjects' response:

-1: no critical distinction nor inference; affective bias (e.g., "I liked analysis 1 and disliked analysis 2."")

0: no critical distinction nor inference; no affective bias

+1: critical distinction or inference, but no mention of supportive data (e.g., "Analysis 1 identifies the problem as X, where Analysis 2 identifies it as Y.")

+2: critical distinction with mention of supportive data

+3: critical distinction or inference with mention of data pro and con one's inference; probabilistic or weighted reconciliation of conflicting data
Critical thinking is important because it appears to be a generic competency of superior performers in almost every field: Better Navy officers, better counselors, better organic chemists, better medieval literature students, better lawyers, etc. all are higher in critical thinking ability.

The procedure for giving this test is to ask a subject to compare and contrast two conflicting statements or analyses of a situation or set of data. The content of the stimulus or data is not important. It can be drawn from any knowledge area or profession; for example, two conflicting tactical plans for an infantry officer, or two conflicting analyses of the same organic compound for an organic chemist.

The coding system for scoring subjects' operant responses is summarized in Figure 2. At low levels of critical thinking, subjects are unable to make a critical distinction or inference between the two sets of data and may show affective biases (e.g., "I liked Analysis 1 and disliked Analysis 2"). At higher levels of critical thinking, persons are better able to make critical distinctions or inferences, cite data to support their positions, and reconcile conflicting data pro and con their inferences (i.e., reason probabilistically or reconcile conflicting data by weighting opposing statements).

Subjects' behavioral event interview protocols can be coded for this dimension, as can their memoranda, arguments in leaderless case discussions, essay responses to problem analysis tests, and the like.

A second example of operant coding of a critical soft skill competency, "accurate empathy" or understanding, is provided in Figure 3. This is a generic competency evidenced by superior performers in a wide range of professional, managerial, and human service workers jobs.

For example, a somewhat surprising finding of our Job Competence Assessment studies of Navy officers was that they spent a sizable amount of their time counseling subordinates, and that superior officers were significantly more proficient in counseling skills. The coding and scaling system provided in Figure 3 is taken from a competency-based training module designed to teach naval officers advising and counseling skills.

Accurate empathy is an assessment of the extent to which the person can accurately hear the content, meaning, and feeling of what another person is saying. This variable is measured by coding the response a subject makes to a live, audio-tape, or written stimulus statement made by a "counselee." The coding system for accurate empathy recognizes three elements: the respondent's accuracy as to (1) the content of what the counselee is talking about; (2) the counselee's meaning (i.e., why he or she is concerned
FIGURE 3

Example:
An Operant Coding System for "Accurate Empathy"
(from Carkhuff, 1969)

Procedure: a subject is asked to make an appropriate
counseling response to a taped or live
statement made by a "counselee"

Understanding (accurate empathy): measures the extent to which
the counselor accurately hears the content, meaning, and feeling
(type of feeling and intensity of feeling) of what the counselee
is saying.

- Content: what the person is talking about—his wife,
his job, an alcohol problem, etc.

- Meaning: why the person is talking about it—"You are
talking about, because..." (e.g., wife, because she’s
leaving him; job, because she’s not doing it as well as
she could, etc.)

- Feeling: how the person feels—the feeling word the
person uses.

  --type of feeling: sad, angry, frustrated

  --intensity of feeling: for example, for anger,
  where on a scale from "mildly irked" to "blind rage"

For example, to a person who has received a "Dear John" letter,
the counselor says:

<table>
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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Content, meaning, feeling absent or wrong</td>
<td>Content accurate; meaning, feeling absent or wrong</td>
<td>Content and meaning accurate; feeling inaccurate or wrong</td>
<td>Content, meaning, feeling all accurate</td>
</tr>
<tr>
<td>&quot;Nice weather, isn't it?&quot; &quot;So what?—get back to work.&quot;</td>
<td>&quot;Sounds like you got marriage problems.&quot;</td>
<td>&quot;Your performance was off today because you got some bad news.&quot;</td>
<td>&quot;You were too upset to work because you got that letter from your wife.&quot;</td>
</tr>
</tbody>
</table>

-25-
-13-
about the content); and (3) the counselee's feeling, both the type of affect and the intensity of affect expressed about the content and meaning.

For example, at a low level of accurate empathy, a Navy officer may respond to a subordinate who has received a "Dear John" letter with a curt, "Tough luck. Get back to work.", or a completely content-irrelevant response such as, "Nice weather, isn't it?" At higher levels of accurate empathy, the officer understands and reflects the subordinate's feelings in the context of their content and meaning (e.g., "You're really shook up because of that letter you got from your wife."). A response of this type makes the subordinate feel understood and facilitates his or her coping with stressful feelings.

A large body of literature indicates that accurate empathy is a critical competency for all types of professionals (e.g., doctors or lawyers, persons in helping positions) (Carkhuff & Berenson, 1976). More recently, it has also been found to be a critical skill for leaders and managers, underlying what is called "concern for people." (It should be emphasized that accurate empathy is not sympathy, feeling what the other feels, but rather understanding, knowing what the other feels, which enables a manager to make the appropriate response to help a subordinate solve a personal problem.)

The important thing about such operant coding systems for any soft skill competency is that they are both highly interrater reliable (i.e., can be accurately recognized) and demonstrate predictive validity (i.e., can be shown to be causally related to superior job performance). Perhaps even more importantly, once soft skills can be defined in this level of behavioral detail, they can be readily taught to others; which leads me to my final subject, training in soft skills.

Training in Soft Skills

Until recently, many educators have been skeptical about the extent to which it is possible to teach or train people in such soft skill competencies (e.g., achievement motivation, critical thinking, accurate empathy, or skillful use of influence). Over the past 25 years, McClelland (McClelland & Winter, 1971) has conclusively shown that achievement motivation, an important cognitive affective competency which predicts success in jobs requiring entrepreneurial initiative, can be taught. The method McClelland prescribes for training to such a competency is relatively simple. It involves (1) teaching people the behavioral coding system for the competency in great detail; (2) practice in assessing their own and other's behaviors in achievement motivation terms; (3) setting specific goals and defining action steps for using the
competency, first in a supportive training environment, and then increasingly in real life. Persons trained in achievement motivation show significant increases in personal income, career advancement, business sales and profits, and create more capital and jobs. (Miron & McClelland, 1979).

In recent work in developing competency-based leadership and management courses for the United States Navy, McBer has developed a fairly standard five-step competency training procedure (Spencer, 1978) which incorporates and expands upon McClelland's principles. I will briefly describe how each of these steps is used to teach the two competencies discussed above under measurement of soft skills, critical thinking, and accurate empathy.

Recognition

Trainees are presented with a difficult case or a simulation problem—designed to produce a "shock of recognition" in which they realize that they actually encounter problems calling for the use of the competency in question in their real jobs, and that they often have trouble dealing with these problems. For example, trainees may be given a complex analytical task which requires critical thinking or be asked to counsel a subordinate in distress in a role-play. The cases and simulations used are drawn from actual critical incidents collected during the behavioral event interview phase of the Job Competence Assessment process. The recognition step is designed to introduce the competency in an experiential way and create specific motivation for learning.

Explanation

Trainees receive practical conceptual input on the competency via readings, lectures, or demonstrations. For example, in the module on critical thinking, trainees are given a lecture on the importance of critical thinking in their field, are taught the critical thinking coding system, and score actual case problem analyses for critical thinking. In a counseling module, trainees are similarly taught the accurate empathy scoring system and then code video-taped demonstrations illustrating lower and higher stages of empathy behavior. Recent research indicates that trainees can quickly acquire a very high degree of reliability (r = .95+) when exposed to behaviorally specific examples of discrete points on a scale (Lawton & Borman, 1978).

Self-Assessment

Trainees receive operant test feedback on their performance on the competency factors which predict superior performance. This feedback in effect tells them, "This is how the superstars in your billet perform on these dimensions, and this is how you perform," which provides trainees with very specific motivation, direction,
and goals for change. Knowledge of the behavioral coding scheme imparted in Step 2 enables trainees to grasp quickly and see exactly what they are doing effectively or ineffectively in terms of a given soft skill competency.

**Skill Practice**

Trainees practice using the competency skills they have been taught. For example, the best way of practicing critical thinking is repeated exposure to analytic case discussions of the type pioneered by Harvard's Law and Business Schools. Students who are repeatedly asked to analyze complex case problems to respond to the insistent questions "What's the problem? Who has it? What are your data?" rapidly gain in the ability to draw critical distinctions and inferences from complex information. (Incidentally, our studies indicate that the case method effectively teaches two competencies; critical thinking and assertive persuasion skills, the ability to "think on one's feet" and articulately defend one's analysis of a situation, or proposed solution to a problem.)

In practicing accurate empathy, students conduct repeated real or simulated counseling sessions which are recorded on video or audio tape, then play back and score their responses on the accurate empathy scale, continuing this process until they reach a mean level of 3 on a 4-point scale, the level which predicts successful performance (Carkhuff & Berenson, 1976).

**Job Application**

In the final step, trainees identify situations in which they will use the competency in their jobs and set goals, anticipate obstacles, and develop an action plan for doing so. This step reinforces the relevance of the training, translates it back into a real job performance context, and increases the likelihood that any soft skill competency learned will be in fact used back on the job.

In summary, the Job Competence Assessment process identifying, measuring, and training soft skills provides a number of benefits. It permits description, in very specific behavioral terms, not only of the elements of a job but the characteristics and skills of the persons who do the job well. These behavioral indices can be used in a variety of personnel functions: development of non-discriminatory selection tests and interview processes and competency-based performance appraisal, "efficiency" or evaluation reports, and the design and evaluation of training programs. Competency-based selection, assessment, and training procedures provide empirical, reliable, predictively valid and face valid methods of defining the soft skills associated with competent job performance: what superior incumbents actually do in their real jobs.
References


INCL 5

TITLE:

OUTLINE OF THE TWO MODELS FOR FRONT-END ANALYSIS
OUTLINE OF THE TWO MODELS FOR FRONT-END ANALYSIS

PROBLEM ALIGNMENT
- Preliminary data collection and analysis
- FEA Model selection

FEA DIAGNOSTIC MODEL

PROBLEM SPECIFICATION
- M - A = D
- Root problem

FEA PLANNING MODEL

MASTERY SPECIFICATION

CAUSE ANALYSIS
- Hypotheses (S/K-ENV-MIA)
- Data collection
- Data analysis

TRAINING SUPPORT
- Job aids
- Instruction

ENVIRONMENT SUPPORT
- Job design
- Environmental design

MOTIVATION DESIGN
- Initial
- Maintenance

SOLUTION SELECTION
(Analysis of alternatives)

SOLUTION PLANNING
## Examples of Cause Hypotheses & Data/Evidence Sources within Cause Categories

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<th>Cause Category</th>
<th>Cause Hypotheses</th>
<th>Data/Evidence Sources</th>
</tr>
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<tr>
<td>Skill/Knowledge Deficits, S/K</td>
<td>• Don't know what</td>
<td>• Formal/informal tests of performers' skills/knowledge</td>
</tr>
<tr>
<td></td>
<td>• Don't know when</td>
<td>• Examine available training</td>
</tr>
<tr>
<td></td>
<td>• Don't know how</td>
<td>• Examine actual/possible use of job aids</td>
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<tr>
<td></td>
<td>• Don't know why</td>
<td>• Interviews/questionnaires</td>
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<tr>
<td></td>
<td></td>
<td>- performers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- supervisors</td>
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<tr>
<td></td>
<td></td>
<td>- other knowledgeable persons</td>
</tr>
<tr>
<td>Environmental Obstacles, Env</td>
<td>• Lack of needed equipment, tools, reference materials</td>
<td>• Examine the performance situation</td>
</tr>
<tr>
<td></td>
<td>• Faulty/poorly designed equipment, tools, reference materials</td>
<td>• Observe performers in the situation</td>
</tr>
<tr>
<td></td>
<td>• Inconvenient access to needed equipment, tools, reference materials</td>
<td>• Interviews/questionnaires with performers, supervisors, other knowledgeable persons</td>
</tr>
<tr>
<td></td>
<td>• Tasks unnecessarily complex or difficult</td>
<td>- equipment, tools, reference materials</td>
</tr>
<tr>
<td></td>
<td>• No or poor supervision</td>
<td>- possible task simplification</td>
</tr>
<tr>
<td></td>
<td>• Uncooperative coworkers</td>
<td>- supervision, coworkers, other aspects of the performance situation</td>
</tr>
<tr>
<td></td>
<td>• Unclear/unstated policies</td>
<td></td>
</tr>
<tr>
<td>Motivation-Incentive-Attitude-Factors, Mia</td>
<td>• Enforcement problem</td>
<td>• Examine the performance situation</td>
</tr>
<tr>
<td></td>
<td>• Feedback problem</td>
<td>• Observe performers in the situation</td>
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<tr>
<td></td>
<td>• Incentive problem</td>
<td>• Interviews/questionnaires:</td>
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<tr>
<td></td>
<td>• Reinforcement problem (e.g., wrong actions rewarded, no rewards)</td>
<td>- performers</td>
</tr>
<tr>
<td></td>
<td>• Unpleasant/socially negative tasks</td>
<td>- supervisors</td>
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<td>- other knowledgeable persons</td>
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TITLE:
NEEDS ASSESSMENT AND HOLISTIC PLANNING:
AN ARRIVING TREND
NEEDS ASSESSMENT AND HOLISTIC PLANNING:
AN ARRIVING TREND

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approval from the author.

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Abstract

Needs assessments are useful starting places for realistic, practical planning. By using information from a correct needs assessment, curriculum may be designed which will be useful to learners and to society. The value of the concept of needs assessment seems readily apparent. However, confusion and controversy concerning definition and scope has arisen among practitioners and researchers. This article attempts to clarify conceptual and philosophical issues and provide a synthesis. In doing so we specify a model based on the relationships between organizational efforts, organizational results and societal impact -- called the organizational elements model. Distinctions are made between environments internal and external to the educational agency. This, then, is a holistic approach because it considers NOT simply teachers, learners, and curriculum, but seeks to link school efforts and results to social requirements and realities. It sees education in a social context, not just a schooling environment. The article concludes with a discussion of arguments typically advanced for or against needs assessment and planning based on what learners should know and do in today's and tomorrow's society.
NEEDS ASSESSMENT AND HOLISTIC PLANNING: AN ARRIVING TREND

There can be little doubt that needs assessments, in one form or another, are becoming a part of educational planning and development. There are kits, admonitions, plans, concepts, and junk (Witkin, 1977). Most needs assessment procedures, but not all (Scriven and Roth, 1978), use some form of a discrepancy model, which asks the educational planner to identify and document the gaps between "what is" and "what should be".

With all of these alternative views, controversy about "need" and needs assessment has surfaced. Much of the controversy is due to how the term "need" is defined and used. Although Kaufman (1972) suggests that "need" be defined as a gap between observed results and desired results as a possible way to remove surplus meanings from use of the term "need", his advice and limiting definition appear to be ignored frequently. By restricting the use of "need" to a gap in results, confusion can be avoided. Seemingly unaware of ambiguity which can be created when a term is used equivocally, some writers (e.g., Schriven and Roth, 1978) proceed to use "need" both as a noun (e.g., as a gap between actual and satisfactory) and as a verb (e.g., "A needs X"). Confusion is increased when they attempt to define needs in terms of process gaps (e.g., "treatment-need") and as a gap between actual and satisfactory (i.e., a "performance-need"). Users get confused as to whether a "need" is a gap in results or a way to eliminate a gap in results. Can "need" be both a means and an end?

All gaps are discrepancies, but not all gaps are "needs". Taking a closer look, gaps or discrepancies can be observed in a number of different places within the complex parts of a school or school system. There can be gaps between present levels of resources and required levels of resources.
Needs Assessment

(e.g., not enough money to purchase reading texts for learners). There can also be gaps in processes (e.g., learning materials are too difficult for one group but not another). And there may also be gaps in results (e.g., some high school graduates cannot read, write or compute well enough to get and keep a job, while others can). Here are three different kinds of gaps. Is each an appropriate example of a "need"?

Although the literature has referred to these different kinds of gaps as "needs", it is more useful to restrict the term "need" to gaps in one of the three types of results: products, outputs, and outcomes. (Definitions for product, output and outcome are given below.) By so doing, we can avoid the troublesome problem of confusing means and ends. When means and ends are allowed to remain confused, we may either allow a means to become an end in itself or to select inappropriate ends. We might rush in with a well-intentioned solution (such as a reading program) and find out later that it doesn't close the gap! And we may have selected the wrong solution to the learning problem because we did not "trace" the presenting problem (such as low reading scores) back into society where we might have found a more basic gap in valuing behavior relative to what should be read. The most basic gaps to which a needs assessment should address itself are the gaps found in society -- gaps in values, aspirations, making a living and the resulting standard of living. The subsequent "internal" needs assessment -- assessing gaps within education -- can be used to identify gaps in educational results and processes.

There is a rational and basic referent for "what should be" -- minimal self-sufficienty and contribution of individuals after they legally exit the formal educational system and enter society (Kaufman, 1972; Kaufman and Carron, 1980). This basic concept serves as the basis for a type of needs
assessment known as External (Kaufman, 1977b) because it has its roots in society, not within the school system. External needs assessment requires that educators begin planning with a determination of the requirements, current and future, for individual and collective self-sufficiency in society.

This, then, is a holistic approach in that it goes beyond the boundaries of the school. A holistic approach provides a link between curriculum, instruction and society. By taking this larger, "Gestalt" or holistic approach we will be able to help learners to be successful in school as well as in society.

Self-sufficiency is defined as economic and social self-reliance (and hopefully contribution) when production (e.g., personal income) is greater than or equal to consumption (e.g., personal expenditures). Determination of self-sufficiency, as used here requires that use of indicators rather than absolute criteria or rigid fixed standards. Moreover, self-sufficiency is culturally dependent. What may be self-sufficiency for one ethnic group or socio-economic class may not be adequate for another. For example, self-sufficiency for individuals in an underdeveloped, agrarian society may require different kinds of knowledge, skills, and income than those required by an individual in a developed, industrialized society. Yet it seems apparent that minimal self-sufficiency can and should be defined for individuals given their societal context. And, unseen to the casual observer, in self-sufficiency are personal factors such as self-concept, values and preferences.

One current limitation of an external needs assessment model is that current knowledge is not totally precise and complete. We only have available present economic indicators of self-sufficiency, and these do not
represent a full array of all possibly important parameters. But something is better than nothing. Indicators currently used include measures of individual credit ratings, income level of specific individuals as compared to others, ability to get and keep a job, individual income-expense ratios and expected levels of income and outgo (Hills and King, Note 1), or freedom from requiring food stamps, welfare, unemployment or other types of transfer payments. While still primitive, recent work indicates that such measures may be derived, and further, decisions relative to alternative public educational programs may be determined on the basis of relating individual and public good, at least to a minimal level (Kaufman and Carron, 1980). There are other indicators of self-sufficiency in the intellectual and social domains of behavior. These would include ability to seek and use information as a citizen, to establish and maintain positive social relationships in the home, on the job and in society.

FORGING A NEW BOND WITH REALITY

Educators, and other interventionists such as legislators, lawyers, social workers, counselors, physicians, community psychologists, and clinical psychologists, should start their planning and needs assessments with an external -- societal -- referent. This external starting place, minimal self-sufficiency in today's and tomorrow's world, represents an intended "outcome" for education.

An outcome is the impact an intervention has upon society. Outcomes, then, serve as the basis for the determination of intended results as well as realistic criteria for assessing the effectiveness of educational agencies (Kaufman and Thomas, 1980). Outcomes are the "bottom line" criteria upon which to begin and then to evaluate planning, program implementation and
To avoid some of the semantic problems, there are three types of results to bear in mind: outcomes, outputs and products. Outcomes are results in society such as citizens who are economically, socially and intellectually self-sufficient. Outputs are the results of an organization which are "delivered" to society, such as graduates who have acquired the skills, knowledge and attitudes to be self-sufficient. Products are the enroute results which an organization produces as it attempts to meet its aims and purposes, e.g., indicators would include courses completed, skills acquired, etc. Processes are the methods and means for obtaining results, such as curriculum and instruction. In order to achieve products, outputs, and outcomes through processes, inputs are required. Inputs are ingredients and starting requirements which a system may use to achieve its purposes, such as money, teachers, goals, objectives, facilities, and the like. Thus there are five organizational elements which derive what a organization does (inputs and processes), what an organization achieves (products and outputs) and the impact all of these elements have in society (outcomes). Figure 1 shows relationships among the "organizational elements", the different levels of results and some examples of each (Kaufman and English, 1979).

Although identifying gaps in inputs and processes is vital to increasing organizational effectiveness and efficiency, we urge that input gaps and process gaps not be classified as bonafide "needs" in order to avoid semantic confusion and erroneous thinking. Inputs and processes have been the subject of so-called needs assessments, but gaps in these areas
Needs Assessment

relate only by inference to results-oriented needs assessments. Gaps in inputs and processes are "quasi-needs" at best. So discrepancy analyses concerned with them might be termed "quasi-needs" assessments with the caveat that they refer to assessing gaps in means and not ends.

Schools have been created to serve society. They are means to societal ends. Therefore, if educational organizational efforts and educational organizational results are going to have the most utility for society now and in the future they should relate to societal outcomes -- results external to the educational organization. The relationship between internal efforts and results, and external societal results is shown in Figure 2.

--- Insert Figure 2 about here ---

If what we do and achieve in education is to have greater usefulness to learners, then linkages must be established between that which educational agencies do to learners and the requirements for individual and collective self-sufficiency and contribution in society. These linkages are depicted in Figure 3.

--- Insert Figure 3 about here ---

SOME PHILOSOPHICAL ISSUES

Planning for individuals and organizations, on the basis of an external referent is basically different from other planning methods and concepts (Simon, 1969; Kaufman, 1972; Provus, 1972; Kaufman & English, 1979). Most existing models and planning efforts start with
an internal set of objectives and move to identify and meet organizational goals and objectives; thus they assume that internally derived goals, objectives, and results will satisfy external societal requirements. But do they? Having to link the internal with the external is a difficult, not fully charted course. There are some who argue that it is impossible or difficult at best, and even some who hold that it should not be attempted. The work of Scriven and Roth (1978) seems to show indications of their considering only the internal aspect of needs assessment. Although Popham (1975) indicates awareness relative to external considerations regarding selection of performance indicators and criteria, he seems to advise against their use on practical grounds.

Following are some arguments and some rebuttals for consideration. While they may represent legitimate concerns in the minds of those who present them, they are not sufficient to keep education planners from using an external referent.

The arguments against using an external referent seem to cluster into five, sometimes overlapping, areas.

These arguments and rebuttals to them are presented below. It should be noted that both sides have little empirical data to support their positions. The arguments, therefore, are philosophical. They will only be resolved when needs assessments using the external referent are tried (Kaufman & Stakenas, Note 2). Following is a brief discussion of each of the opposing arguments and responses to those positions.

**Argument one:** The economic utility referent of self-sufficiency is too narrow and restrictive, and does not represent the full array and richness of what an educational system should provide for learners,
because it is only an indicator and not sensitive to all people under all conditions, or both.

Rebuttal to argument one: While it is true that an "indicator" such as self-sufficiency does not describe the full array of skills, knowledges and attitudes that a school does or could deliver, it is suggested that self-sufficiency is the MINIMAL outcome requirement for a school, and that intangibles such as critical thinking, self-respect, good citizenship, and art appreciation, while they are important, are much more meaningful when an individual is achieving or is on the way to achieving self-sufficiency. An external needs assessment does not rule out such intangibles, it only requires that self-sufficiency be the basic, "bottom line" for educational planning.

Argument two: The economic utility data for self-sufficiency is difficult if not impossible to obtain.

Rebuttal to argument two: Much individual information about income and financial worth is private, and is protected by law. There are, however, indicators of self-sufficiency which will provide educational planners and evaluators with a more useful planning base than pure conjecture, or good intentions alone. Indicators include individual credit ratings, samplings of a variety of net worth statements for individuals typical of a part of the target population, poverty-level data for a region or district or the absence of having to get unemployment, welfare, food stamps or other charity. Thus, while the data might be expensive or difficult to obtain, useful indicators may be derived, and these provide a better planning base than what is currently being used.
Argument three: Organizational focus and change of this major magnitude is threatening to educators and parents, and thus will not be permitted.

Rebuttal to argument three: It is true that substantial change tends to be threatening to many individuals and that those who advocate or attempt it are often "punished" (Reusch, 1975). It also seems to be true that change-for-change-sake is more threatening than change which makes sense to the individuals being asked to change. While much change which has been attempted in schools (and indeed in other social agencies) has not been wildly successful, change has occurred. We suggest that when change is introduced which seems rational as well as logical, much of the opposition (but, not all) will be reduced. By basing change requirements on external realities such as self-sufficiency, and not upon internal considerations such as busing, team teaching, behaviorism, modular scheduling, or computer-assisted instruction, we suggest that people will have better reason for attempting change. Many of our previous attempts at change only proposed to exchange one "means" for another (busing as a substitute or adjunct to curriculum, for example). This type of exchange, rather than "deep change" (Kaufman & English, 1979; Kaufman & Stakenas, Note 2) is less than productive in most instances, and deserves resistance.

Argument four: The linkages between educational efforts and results and societal outcomes are not available, and are tenuous to build.

Rebuttal to Argument four: There are neither data nor models which clearly link outcomes with the other educational elements of inputs, processes, products, and outputs. This has not been a central
issue until now, and the procedures and models for so doing are only
now being considered. This argument, then, has currency. However, we
suggest that with the understanding and commitment to planning using
an external referent, then such linkages can and will be developed
(Kaufman & Carron, 1980). There is another aspect to this argument;
perhaps some current curricular offerings might have to be changed.
Justifying some existing courses and curriculum in schools might be
increasingly difficult if one were to put primary emphasis for minimal
products, outputs, and outcomes upon self-sufficiency. Clear linkages
do not currently exist, nor does any justification for the effective-
ness of current offerings in helping today's and tomorrow's citizens
(Sobel, 1980).

**Argument five:** Educators should not set educational goals, but
only carry out policy which is set by legislators, executive branches
of government, or policy boards outside of the schools.

**Rebuttal for Argument five:** It is true that in most cases
legislators, de facto, set educational goals and objectives by the way
in which they fund (thus "enable") education. By attaching how-to-do-it
provisos to funding bills, they not only set the intended results but
also prescribe the inputs and processes. Actually, they most often
prescribe inputs and processes that shape the products and outputs.
And when it doesn't work out well they blame education and tinker once
more with inputs and processes. This situation is "what is". It does
not have to be "what should be" or "what will be".

Legislators are not usually educational experts. They are elected
representatives with a strong instinct for survival and usually a desire
to help their constituency. They are neither evil nor destructive by nature, and they often legislate inputs and processes in frustration over not having some useful criteria by which to judge and provide for the schools (Carron, 1977).

By using planning data which comes from an external referent, the legislator and the executive branch will be able to make more rational, useful decisions about education. By involving them in the needs assessment and by providing them information on the basis of self-sufficiency (which makes sense to most lay persons), educators may forge a new bond with reality.

A frequently encountered subset of this argument is that planned change is impossible within a school or school system. If change is to occur, they argue, then it has to be prescribed at the highest levels. This concept has just no support. Change is possible if people are convinced changed is useful and desirable (Greenwald, 1973). A "victim" mentality which presupposes that change is impossible will usually result in a self-fulfilled prophecy. It does not have to be so.

IMPLICATIONS FOR SCHOOLS

The effectiveness and efficiency of schools may be dramatically improved by adopting a holistic view of the relationship between schools (as means, or processes) and the societal end of self-sufficiency. Instead of educational processes which end at the front door of the schoolhouse, this approach requires that the planning, design, development, evaluation, and revision referent for education begin in the
external world outside of schools. A model for deriving and designing useful education is presented in Figure 4.

By starting the educational design and development process with external considerations, we are more likely to select and organize inputs and processes that will result in socially valued results and, consequently, increase public acceptance and support for the educational enterprise.

This process is dramatically different than that which is currently used in education (and indeed training as well). It seems to be a rational, effective way of proceeding. It is likely to result in less "educational scrap" (Lessinger & Conners, 1978) and less public disdain for education. It does not seem to make sense to begin and end educational needs assessment and planning at the front door of the schoolhouse. Learners do not stop there, so why should our planning and evaluation?

CONCLUSIONS

To base something as important -- crucial in fact -- as education on the basis of results "internal" to education seems to be no longer acceptable. We must begin to portray new realities and relationships for decision-makers and legislators and move towards linking external results in society with those internal to education. It is not only logical, but it is rational as well.
REFERENCE NOTES


REFERENCES


FOOTNOTES

Requests for reprints should be sent to either author at the Center for Needs Assessment and Planning, Florida State University, Tallahassee, Florida 32306.

1There appears to be a misconception on the part of some that a discrepancy model is a deficiency or deficit model of need. Careful analysis of definitions is required to make this determination. A discrepancy model does not have to be a deficiency or deficit model.
FIGURE CAPTIONS

Figure 1. Relationships between organizational elements and results and some examples of each (Based on Kaufman & English, 1979).

Figure 2. The suggested relationships between internal organizational efforts and results and external societal results (after Kaufman & English, 1979). Combining both internal and external viewpoints yields a holistic emphasis.

Figure 3. Bridging the internal-external interface by establishing required linkages between organizational efforts, organizational results and societal results.

Figure 4. A strategy for educational system design.
Figure 1

Needs Assessment

- Inputs: e.g., money, time, buildings, teachers, learners, needs, problems, objectives, curriculum materials
- Processes: e.g., staffing patterns, competency based, vocational, instructional
- Products: e.g., courses completed, knowledge, and attitudes acquired
- Outputs: e.g., certified completion, job entry skills, licenses
- Outcomes: e.g., current and future individual and group self-sufficiency and contribution

TOP
Needs Assessment

Figure 2

[Diagram showing relationships between organizational efforts, internal results, societal results, and external aspects, with a holistic emphasis.]
Needs Assessment

Figure 3
Needs Assessment

Figure 4

INPUTS
- Determine required personnel & other resources

PROCESS
- Determine effective and efficient methods

PRODUCTS
- Determine course completion requirements

OUTPUTS
- Determine graduation requirements

OUTCOMES
- Select current and future requirements

- Determine current minimal requirements for self-sufficiency
- Determine future minimal requirements for self-sufficiency
- Determine future desired requirements for self-sufficiency and contribution

Obtain resources and implement processes
TITLE:
FRONT-END ANALYSIS (FEA) OVERVIEW
FRONT END ANALYSIS (FEA) OVERVIEW

Mr. Taft H. Joseph, Jr.
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Directorate of Training Developments
United States Army Field Artillery School
Fort Sill, Oklahoma 73503
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AUTOVON 639-3092
TRADOC PAM 350-30 HAS BEEN THE MAIN DOCUMENT FOR PERFORMING FRONT-END ANALYSIS (FEA) WITHIN THE TRADOC COMMUNITY FOR SEVERAL YEARS. THE ISD MODEL OUTLINED IN THE PAM AND DEVELOPED BY FLORIDA STATE UNIVERSITY IS EXCELLENT FOR ANALYZING A JOB IN WHICH AN INDIVIDUAL IS ONLY CONCERNED WITH PERFORMING MOTOR-TYPE TASKS. HOWEVER, ONCE WE TRY TO DETERMINE THE COLLECTIVE AND SUPERVISORY TASKS, THE PROCEDURES FAIL TO WORK AS WELL, AND IT IS DIFFICULT TO PRODUCE A COMPLETE ANALYSIS BASE AND DESIGN APPROPRIATE TRAINING PRODUCTS. AS ONE OF THE RETO PILOT SCHOOLS, USAFAS (CETC) HAS, OVER A TWO-YEAR PERIOD, APPLIED UPON THE EXCELLENT ISD PROCEDURES AND MET THE LONG-STANDING CHALLENGE TO DEVELOP A METHODOLOGY THAT WOULD ENABLE AN ANALYST TO IDENTIFY WHAT SUPERVISORS DO IN THEIR FA SPECIALTY AREAS AND FURTHER TO DEVELOP TRAINING FROM THESE TASKS. THIS METHODOLOGY, WHICH CONCENTRATES HEAVILY ON THE TOTAL ORGANIZATION, CO-RELATES WITH THE CURRENT TRADOC COLLECTIVE TRAINING ANALYSIS DOCTRINE. BY USING THE ARTEP TASKS DERIVED FROM THIS TOP-DOWN APPROACH, WE ARE FURTHER ABLE TO DEVELOP THE MUCH-NEEDED ARTEP/INDIVIDUAL TASKS CROSSWALK FOR THE FIELD. BEFORE WE GET INTO THE CROSSWALK METHODOLOGY, LET US FIRST EXAMINE THE OVERALL PROCESS.
SHOW SL #1

COLLECTIVE FEA

ARTEP TASKS

INDIVIDUAL FEA

- WHAT SHOULD BE DONE
- WHAT IS ACTUALLY BEING DONE
- WHAT SHOULD BE TRAINED
- WHERE TO TRAIN
THE COLLECTIVE FEA RESULTS IN THE IDENTIFICATION OF ARTEP TASKS. THESE ARTEP TASKS ARE THEN USED AS A STARTPOINT FOR THE DEVELOPMENT OF INDIVIDUAL TASKS. A NATURAL DIALOGUE IS ESTABLISHED BETWEEN THE ANALYST RESPONSIBLE FOR INDIVIDUAL TASK IDENTIFICATION AND PRODUCTS AND THE COLLECTIVE ANALYST WHO MUST PRODUCE THE ARTEP. THIS DIALOGUE RESULTS IN A REFINEMENT PROCESS BETWEEN THE DEVELOPMENT OF INDIVIDUAL AND COLLECTIVE ANALYSIS AND INITIATES THE AUDIT TRAIL PROCEDURES THAT WILL EVENTUALLY RESULT IN A COMMON ANALYSIS BASE. TO ARRIVE AT A FINAL ANALYSIS BASE A FRONT-END ANALYSIS (FEA) MUST BE ACCOMPLISHED.

AT THE INSTITUTION WE ARE CAPABLE OF DEVELOPING THE DESIRED FA DOCTRINE AND FURTHER HAVE GREAT CONTROL OVER THE STRUCTURE OF OUR ORGANIZATION, TOE OR TDA. OUR ANALYSTS CAN THEREFORE BY USING DOCTRINE, STRUCTURE, AND SUBJECT MATTER EXPERTS (SME’s) CAN DERIVE WHAT THE INSTITUTION FEELS SHOULD BE DONE AND WHO SHOULD DO IT. THE MAJOR RESULTS OF THIS FIRST STEP ARE INITIAL TASKS LISTS DEVELOPED IN A MANNER THAT PRODUCES A CORRELATION OR CROSSWALK BETWEEN ARTEP UNIT TYPE TASKS AND THE INDIVIDUAL TASKS REQUIRED TO SUPPORT THEM. IN ORDER TO ACCURATELY DEPICT A TOTAL PICTURE OF THE ORGANIZATION OR ONE OF ITS SUB-SYSTEMS A MODEL MUST BE USED THAT CONSIDERS THE ASPECTS OF SUPERVISION, GOALS OF THE ORGANIZATIONS, EQUIPMENT, AND THE INDIVIDUAL TASKS PERFORMED BY SUBORDINATES.
NOTE: ABOVE MODEL DEVELOPED BY MR. JOSEPH (USAFAS) NOV 1977
To relate the supervisor to the subordinate within an organization, the principle of involvement has been established. When a subordinate performer performs a task (can be any grade - for example: E-1 or O-3), the first line supervisor is highly involved with the individual as he performs that task. The second line supervisor is moderately involved with the task being performed. Additionally, the third line supervisor has low involvement through the second and first line supervisors. The supervisors, in addition to their levels of involvement when a task is being performed by a subordinate, may sometimes be required to perform the same task themselves. They will also be responsible to perform tasks which they alone must do. The performer will always be the most involved and the degree of involvement decreases as we progress up the chain of command. Authority, on the other hand, will increase as we progress upward.

This organizational model can be used to develop individual tasks in conjunction with an ARTEP task. The hierarchy is shown along the left side. Any level of supervision above the third line supervisor is considered to have low involvement. Levels of involvement will change in the organization depending upon who is performing the task. The subordinate performer and the supervisors all have tasks which they must perform in concert, if the ARTEP task is to be properly executed. The relationship between the subordinate performer and the supervisory levels has been previously discussed. When the first line supervisor performs tasks, the next higher supervisor (the second line supervisor) is highly involved and the third line supervisor becomes moderately involved. The third line supervisor, who had low involvement with the subordinate performer's tasks, is shown to have high involvement with the tasks of the second line supervisor. It can be noted that the third line supervisor also has tasks that he must perform.
SHOW SLIDE #3

ORGANIZATION: LANCE FIRING PLATOON

STEP TASK: POSITION, CHECK, LAY, ARM AND FIRE THE MISSILE ROUND. (3-1-4-5)

<table>
<thead>
<tr>
<th>LOW</th>
<th>MODERATE</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-02 INVOLVEMENT</td>
<td>WITH E3-E5</td>
<td>WITH E6</td>
</tr>
<tr>
<td>M0DERATE</td>
<td>HIGH</td>
<td>LAY THE LAUNCHER</td>
</tr>
<tr>
<td>E7 INVOLVEMENT</td>
<td>WITH</td>
<td>FOR AZIMUTH (REMOTE THEODOLITE)</td>
</tr>
<tr>
<td>HIGH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E6 INVOLVEMENT</td>
<td>WITH E3-E5</td>
<td>POSITION LAUNCHER OVER FIRING POINT</td>
</tr>
<tr>
<td>E3-E5</td>
<td></td>
<td>THE REAR RAMP</td>
</tr>
<tr>
<td>ETC.</td>
<td></td>
<td>ETC.</td>
</tr>
</tbody>
</table>

OBTAIN TRANSPORT LOCK PIN, UPPER POD APU AND GREEN APU STREAMERS
A more practical, military application can be seen by an analysis of the Lance Firing Platoon. Working with the organization of the Lance Firing Platoon, the analyst concentrates on the ARTEP task shown. By using the model, along with the pertinent references, and having a knowledge of the jobs within the Lance Firing Platoon, the analyst begins the systematic development of the individual tasks for each position as they relate directly to the ARTEP task "Position, check, lay, arm and fire the missile round."

A simple example of an organization and its collective and individual relationships can be seen in this slide. Note that the tasks can now all be written using performance-oriented action verbs. By doing this and showing only the degree of involvement, we can get away from using nebulous action verbs, such as "supervise," "manage," "control," and generalized task statements for the supervisor which seriously cloud the issue, cause redundancy, and serve no useful purpose in the training design of tasks for the supervisor.

The analyst actually identified 32 tasks that were performed by the lower skill levels shown (E-3 - E-5) but, for example purposes, only the one task "lower/raise the rear ramp" is shown to illustrate use of the model. The supervisors (E-6, E-7, O-1 - O-2), in addition to their supervisory involvement, are shown to have performance tasks which they themselves must perform. These tasks are all developed based on the one ARTEP task shown.

A crosswalk relationship within the organization can be developed as shown in this matrix.
CROSSWALK OF INDIVIDUAL TASKS
WITH ARTEP TASK 3-1-4-5- "PERFORM, CHECK, LAY, ARM & FIRE THE MISSILE ROUND

<table>
<thead>
<tr>
<th>Task</th>
<th>E3-E5</th>
<th>E6</th>
<th>E7</th>
<th>01-02</th>
<th>03</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>P</td>
<td>HIGH</td>
<td>MOD</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>2</td>
<td>P</td>
<td>HIGH</td>
<td>MOD</td>
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<td>MOD</td>
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<td>P</td>
<td>HIGH</td>
<td>MOD</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>7</td>
<td>P</td>
<td>P/S</td>
<td></td>
<td>HIGH</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>P</td>
<td>P</td>
<td></td>
<td>HIGH</td>
<td></td>
</tr>
</tbody>
</table>

P = PERFORMS TASK
P/S = PERFORMS OR SUPERVISES TASK DEPENDING ON THE SITUATION
HIGH = HIGH SUPERVISORY INVOLVEMENT WITH TASK
MOD = MODERATE SUPERVISORY INVOLVEMENT WITH TASK
LOW = LOW SUPERVISORY INVOLVEMENT WITH TASK
WE NOW HAVE IDENTIFIED WHO PERFORMS, WHO PERFORMS AND SUPERVISES, OR WHO ONLY SUPERVISES (DEGREE OF INVOLVEMENT) EACH TASK. THIS METHOD NOT ONLY PROVIDES A CORRELATION BETWEEN THE COLLECTIVE AND INDIVIDUAL TASKS OF THE LANCE FIRING PLATOON, BUT IT ALSO BEGINS TO GIVE INDICATIONS OF THE TRAINING NEEDS FOR ALL OF THE INDIVIDUALS WITHIN THE PLATOON. IN THE PAST, WHERE WE HAVE EITHER UNDERTRAINED OR OVERTRAINED IN A CERTAIN COURSE OF INSTRUCTION, THIS METHOD ALLOWS US TO TAILOR A COURSE MORE CLOSELY WITH WHAT AN INDIVIDUAL MUST ACTUALLY DO IN HIS FUTURE JOB. THIS IS ESPECIALLY CRITICAL FOR OFFICERS WHO ENTER THE SYSTEM DIRECTLY AFTER COMMISSIONING.

UP TO THIS POINT WE HAVE ONLY DETERMINED WHAT WE THINK "SHOULD BE" THE FIRST STEP IN THE FEA PROCESS.
SHOW SLIDE #5

- Collective FEA
- Artep Tasks
- Individual FEA

- What should be done
- What is actually being done
- What should be trained
- Where to train
TO PREVENT THE INSTITUTION FROM BECOMING TOO PAPOCHIAL AND TO PROVIDE BETTER TRAINED INDIVIDUALS AND TRAINING PRODUCTS TO THE FIELD WE MUST PURSUE THE SECOND STEP OF THE FEA PROCESS AND DETERMINE "WHAT IS" AND WHO IS ACTUALLY DOING IT. THIS CAN BE ACCOMPLISHED THROUGH THE EXTENSIVE USE OF THE INTERVIEW PROCESS OF JOB INCUMBENTS AND THEIR SUPERVISORS, AND THROUGH THE USE OF QUESTIONNAIRES AND SURVEYS. WE CONSIDER THE INTERVIEW COUPLED WITH SPECIFIC JOB ORIENTED QUESTIONNAIRES THE MOST VALID APPROACH. WE USE SCALES RECOMMENDED BY DA PAM 351-4 AND THOSE WHICH WE HAVE INTERNALLY DEVELOPED TO COMPLIMENT OUR SUPERVISORY INVOLVEMENT APPROACH.
CRITERIA / SCALES

HELPS

PERFORM / SUPERVISE

DETERMINE-

SUPERVISORY INVOLVEMENT

WHAT IS?

FREQUENCY

BY WHOM?

CRITICALITY

DIFFICULTY
ONCE WE OBTAIN THIS DATA WE ARE ABLE TO INSERT IT IN A DECISION TREE MODEL WHICH IS COMPUTER ASSISTED PROVIDING US WITH AN ANALYSIS DATA BASE. ACQUIRED DATA IS NATURALLY USELESS UNLESS WE HAVE A CREDIBLE WAY OF GAINING AN OUTPUT. IN THIS CASE USE OF THE VARIOUS SCALES AND DATA PROVIDE US THE NEEDED OUTPUTS OF WHAT TASKS ARE TO BE TRAINED (STEP 3 OF AN FEA PROCESS).

SHOW SLIDE #7

COLLECTIVE FEA
   ↓
ARTEP TASKS
   ↓
INDIVIDUAL FEA

✓ • WHAT SHOULD BE DONE
✓ • WHAT IS ACTUALLY BEING DONE

• WHAT SHOULD BE TRAINED
• WHERE TO TRAIN
AN ADDITIONAL OUTPUT FROM THIS DECISION PROCESS IS DEGREE OF TRAINING. OUR MODEL DIFFERS GREATLY FROM OTHERS PREVIOUSLY DEVELOPED IN THAT WE ARE ABLE TO DETERMINE DEGREE OF TRAINING FOR SUPERVISORS AS WELL AS SUBORDINATES.

SHOW SLIDE #8

OVERTRAIN - Trainee must be trained to a high standard of retention. This is accomplished by reinforcement training.

TRAIN - Trainee must be able to demonstrate proficiency in performing task at speed required on the job.

SOME TRAINING - Trainee must be trained, but not necessarily to the proficiency/speed required to perform the task on the job.

NO TRAINING - Formal training not required. Skills can be acquired on the job.
THESE DEFINITIONS FURTHER EXPLAIN THE ADDITIONAL OUTPUT OF DEGREE OF TRAINING RECEIVED FOR EACH TASK. ONCE THIS TYPE INFORMATION IS PASSED TO THE DESIGNER & DEVELOPER, A MORE ACCURATE AMOUNT (OR INTENSITY) OF TRAINING CAN BE DETERMINED DEPENDING ON THE INDIVIDUAL'S POSITION IN THE ORGANIZATION.

WE CAN NOW TRANSGRESS TO THE LAST STEP OF THE FEA PROCESS, THAT OF DETERMINING "WHERE TO TRAIN".

SHOW SLIDE #9

COLLECTIVE FEA

APPLICABLE TASKS

INDIVIDUAL FEA

✓ • WHAT SHOULD BE DONE
✓ • WHAT IS ACTUALLY BEING DONE
✓ • WHAT SHOULD BE TRAINED

WHERE TO TRAIN
WE CAN, OF COURSE, BEGIN ANALYZATION / DOCUMENTATION (CONDITIONS, STANDARDS, ELEMENTS, ETC.) OF TASKS ONCE THE BOARD HAS SELECTED THEM FOR TRAINING, WHICH COULD BEGIN PRIOR TO OUR LAST STEPS AND NORMALLY DOES TO SAVE TIME AND TO KEEP THE ANALYSTS BUSY. THE "WHERE TO TRAIN" OR SITE SELECTION PROCESS CONSIDERS THE FOLLOWING CRITERIA PRIOR TO MAKING A DECISION ON A CERTAIN TASK.

SHOW SLIDE #10

WHERE TO TRAIN CRITERIA:

• CONSEQUENCES OF INADEQUATE PERFORMANCE

• DELAY TOLERANCE

• IMMEDIACY OF PERFORMANCE

• EQUIPMENT AVAILABILITY
THE MAJOR OUTPUT FROM THIS DECISION PROCESS BY THE SITE SELECTION BOARD IS THE DETERMINATION OF WHERE A TASK SHOULD BE TAUGHT.

RS - RESIDENT SCHOOL - THE ARMY BRANCH SCHOOLS (i.e., FIELD ARTILLERY SCHOOL, INFANTRY SCHOOL, ETC)

ISS - INSTALLATION SUPPORT SCHOOL - THE SCHOOLS CREATED AT MAJOR ARMY INSTALLATIONS, (i.e., ARMORER SCHOOL, CBR SCHOOL, ETC)

FOJT - FORMAL ON-THE-JOB TRAINING - FORMAL TRAINING CONDUCTED BY UNIT PERSONNEL

STEP - SELF-TEACHING EXPORTABLE PACKAGES - MATERIAL THAT IS SENT TO A UNIT BY THE BRANCH SCHOOL (i.e., CORRESPONDENCE COURSES, TEC, ETC)
AFTER THE BOARD DETERMINES WHERE EACH TASK SHOULD BE TAUGHT, THEY
SHOULD MAKE THESE RECOMMENDATIONS THAT WOULD BE CONSIDERED FOR INCLUSION
IN THE TRAINING STRATEGY.

SHOW SLIDE #17

<table>
<thead>
<tr>
<th>INDIVIDUAL TASKS</th>
<th>CROSSWALK</th>
<th>MGS</th>
<th>LOCATION OF PRIMARY TRAINING REFERENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2B55.01-0400 LOWER/RAISE THE REAR RAMP</td>
<td>1 0 8</td>
<td>8 8</td>
<td>8-1425-485-10-2</td>
</tr>
<tr>
<td>2B55. 1-0410 LOWER/RAISE THE CAB TOP</td>
<td>1 0 8 8 8 8</td>
<td>8 8</td>
<td>8-1425-485-10-2</td>
</tr>
<tr>
<td>2B55. 1-0330 EMPLACE THE FIRING DEVICE AT THE FIRING POINT</td>
<td>1 8 8 8 8</td>
<td>8 8</td>
<td>8-1425-485-10-2</td>
</tr>
<tr>
<td>2B55. 1-0430 SET UP/RECOVER THE TARGET SET</td>
<td>1 1 8 8 8</td>
<td>8 8</td>
<td>8-1425-485-10-2</td>
</tr>
<tr>
<td>2B55. 1-0150 INSTALL/REMOVE CONTROL SURFACES</td>
<td>1 1 8 8 8</td>
<td>8 8</td>
<td>8-1425-485-10-2</td>
</tr>
<tr>
<td>2B55. 01-0040 POSITION THE LAUNCHER OVER THE FIRING POINT</td>
<td>1 1 8 8 8</td>
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</tr>
<tr>
<td>2B55. 01-0300 LAY THE LAUNCHER FOR AZIMUTH (REMOTE THEODOLITE)</td>
<td>1 1 8 8 8</td>
<td>8 8</td>
<td>8-1425-485-10-2</td>
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<tr>
<td>2B55. 01-0440 OBTAIN TRANSPORT PACK PIN, LINES, APU AND GREEN APU STREAMERS</td>
<td>1 8 8 8 8</td>
<td>8 8</td>
<td>8-1425-485-10-2</td>
</tr>
</tbody>
</table>

CODES

- A. Perform
- B. Perform and Supervise
- C. Supervise

0. No Formal Training
1. Resident School
2. Installation Support School
3. Formal On-the-Job Training
4. Self-Teaching Exportable Package
THE FINAL RECOMMENDATIONS MADE FOR FINALIZATION OF THE TRAINING STRATEGY WILL BE THE CAPSTONE OF TRAINING FOR THE FA SPECIALTY AREAS BY MOS AND OFFICER SSI. AFTER APPROVAL BY THE COMMANDANT WE WILL HAVE THE GREEN LIGHT FOR THE DEVELOPMENT OF TRAINING PRODUCTS BY TASK.

ADDITIONALLY, THERE APPEARS TO BE A GREAT DEMAND FOR A CROSSWALK DELIVERABLE THAT WOULD PROVIDE KEY INFORMATION TO THE TRAINERS IN THE FIELD. THIS "STRAWMAN" EXAMPLE COULD ASSIST THE UNIT IN CONCENTRATING ITS TRAINING EFFORT ON THOSE INDIVIDUAL TASKS THAT AFFECTED A DEFICIENT ARTEP AREA. THE CODE SHOWS THE RELATIONSHIP OF EACH INDIVIDUAL TO EACH TASK AND WHERE THE INDIVIDUAL RECEIVES TRAINING FOR THE TASK, IF ANY.

FOR EXAMPLE, THE CODE "A" SHOWS THAT TASK 2853.01-0070 "LOWER/RAISE THE REAR RAMP" IS PERFORMED BY BOTH THE SKILL LEVEL 1 AND 2 INDIVIDUALS. THE "1" WITH THE "A" MEANS THEY BOTH RECEIVED THAT TRAINING IN THE RESIDENT SCHOOL. NOTE ALSO THAT THE CODE "C,0" ATTRIBUTED TO THE SKILL LEVEL 3 & 4 POSITIONS AND THE FIRING PLATOON LEADER (01/02) INDICATES THEY ARE REQUIRED TO SUPERVISE THE TASK TO SOME DEGREE AND HAVE NOT RECEIVED ANY FORMAL TRAINING. TASK 2853.01-0440 INDICATES THE 01/02 PLATOON LEADER IS THE ONLY INDIVIDUAL IN THE ORGANIZATION REQUIRED TO PERFORM THE TASK. HE HAS RECEIVED FORMAL INSTRUCTION ON HOW TO PERFORM THE TASK. THE CHECKED BLOCK UNDER MQS II MEANS THE TASK IS REQUIRED TO BE MASTERED BY THE OFFICER BETWEEN HIS FIRST THREE YEARS OF COMMISSIONED SERVICE. THE REFERENCES SHOWN IN THE LAST COLUMN ARE THE ARTEP & SOLDIER'S MANUALS OR PRIMARY TRAINING REFERENCES THAT RELATE TO THE TASKS.

7-20
SHOW SLIDE #13

PRODUCTS

OFFICER'S MANUALS

SOLDIER'S MANUALS

COMMANDER'S MANUAL / TRAINEES GUIDE

JCB BOOKS (JB)

SKILL QUALIFICATION TEST (SQT)

PRESSES OF INSTRUCTION (POI)

EXPORTABLE TRAINING MATERIALS
AS YOU HAVE SEEN, THE FEA PROCESS IS COMPLICATED AND DETAILED. THE ANALYSIS BASE ONCE DEVELOPED WILL, HOWEVER, WITH ONGOING MODIFICATIONS, PROVIDE A COMMON POINT OF DEPARTURE FOR ALL OF THE DELIVERABLES CURRENTLY BEING PRODUCED IN TRADOC (E.G., SOLDIER’S MANUALS, TRAINER’S GUIDE, JOB BOOKS, ARTEPS, OFFICER’S MANUALS AND RESIDENT AND NON-RESIDENT INSTRUCTION). WITH WELL-TRAINED ANALYSTS AND A GOOD PLAN, COUPLED WITH WELL DESIGNED AUDIT TRAIL PROCEDURES, THIS PROCESS IS MANAGEABLE AND EXTREMELY BENEFICIAL.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Begin</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSTITUTIONAL ANALYSIS</td>
<td>APR 80</td>
<td>JUL 80</td>
</tr>
<tr>
<td>FIELD VALIDATION</td>
<td>AUG 80</td>
<td>OCT 80</td>
</tr>
<tr>
<td>TASK/SITE SELECTION BOARDS</td>
<td>OCT 80</td>
<td>FEB 81</td>
</tr>
</tbody>
</table>
BECAUSE OF THE NEED FOR A COMMON ANALYSIS BASE FROM WHICH ALL TRAINING CAN BE DEVELOPED AND THE DESIRE FOR A CROSSWALK FOR PROBABLY INCLUSION IN THE TRAINER'S GUIDE, A REANALYSIS EFFORT WAS BEGUN BY USAFAS IN APRIL 1980. THE "WHAT SHOULD BE" ASPECTS OF THE FEA WERE COMPLETED IN JULY OF 1980. THE "WHAT IS" ASPECT OR VALIDATION PHASE BEGAN IN AUGUST 1980 WITH FIELD VISITS TO 5TH AND 7TH CORPS ELEMENTS IN GERMANY. TASK/SITE SELECTION BOARDS ARE ANTICIPATED TO BEGIN IN OCTOBER 1980 AND COMPLETED FOR ALL MOS AND OFFICER SSIs BY FEBRUARY OF 1981. THIS CONCLUDES BY BRIEFING....ARE THERE ANY QUESTIONS?
TITLE:
UNITED STATES ARMY ORGANIZATIONAL EFFECTIVENESS CENTER AND SCHOOL'S EXPERIENCE
Objective

To present the United States Army Organizational Effectiveness Center and School’s experience using a Competency System to develop training for the Organizational Effectiveness Staff Officer Course.
Rationale for Using a Competency System

- Traditional JTA appears more suitable for "hard" skills than "soft" skills areas.

- Performance of soft skills has an added dimension in which a JTA cannot measure.

- Our interface with ARI and the Navy produced a viable alternative to traditional JTA.

- GECS faculty wanted to know the characteristics of a superior Management Consultant.
Competency System

- Analyze
- Design/Development
- Implement
- Evaluate
Pre-Work Process

- OECS contacted ARI who contracted McBee & Company to conduct a Job Competence Assessment (JCA) on Army OESOs (MCs).

- OECS and ARI sent representatives to the Navy Personnel Research Development Center (NPRDC) to obtain their Lessons Learned.

- OECS personnel closely examined the Navy's use of the JCA process in developing training in leadership.
Lessons Learned From NAVY/NPPDC

- One Project Manager
- Roles among ARI, OEGS, and contractor must be understood.
- Host IPR's
- Be specific with desired outcomes.
- Conduct a traditional Job Task Analysis.
- Criterion groups should be superior and average.
- Performance Evaluation Measures must be developed.
Signs in the 1920s

- 1920s - Views that 1920s were the best and had all the old performance characteristics for use in a survey sent to 300
  families.
- 1920s - Have a poor assumption of the data.
  Functional analysis, Superiority and Farmer characteristics were
  matched.
- Winter 1920
  No of 1920 - 226118 and 17203 conducted electrical content
  of all the variables.
- Winter 1920 - Conducted electrical content on 17203, 17063.
## COMPETENCY SYSTEM

### 9 CLUSTERS
34 COMPETENCIES

<table>
<thead>
<tr>
<th>ANALYZE</th>
<th>DESIGN/DEVELOPMENT</th>
<th>IMPLEMENT</th>
<th>EVALUATE</th>
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<tbody>
<tr>
<td>CLUSTERS</td>
<td>COMPETENCIES</td>
<td>INTERACTIVE EFFECTS:</td>
<td>MATCHES the methodology</td>
</tr>
<tr>
<td>&quot;Results Orientation&quot;</td>
<td>&quot;Concern for Measurable Outcomes&quot;</td>
<td>ANTECEDENT &quot;Concern for Clarity&quot;</td>
<td>used in the</td>
</tr>
<tr>
<td>COMPETENCIES</td>
<td>PERFORMANCE INDICATORS</td>
<td>SUBSEQUENT</td>
<td>Skill</td>
</tr>
<tr>
<td>&quot;Concern for Measurable Outcomes&quot;</td>
<td>&quot;Describes Specific Milestones&quot;</td>
<td>&quot;Cause and Effect Thinking&quot;</td>
<td>Development.</td>
</tr>
<tr>
<td>&quot;Describes Specific Milestones&quot;</td>
<td>&quot;Etc.&quot;</td>
<td>IV. SKILL DEVELOPMENT</td>
<td>V. Job Application:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Simulate Contracting</td>
<td></td>
</tr>
</tbody>
</table>
A HYPOTHETICAL DYNAMIC PROCESS MODEL OF COMPETENCY INTERACTION

1. Functional Knowledge
2. Strong Self-Concept
3. Develops Common Understanding
4. Tacit Knowledge
5. Personal Influence
6. Diagnostic Skills
7. Problem-Solving Skills
8. Tactical Flexibility
9. Results Orientation
INCL 9

TITLE:

ARMY OCCUPATIONAL SURVEY PROGRAM (AOSP)
ARMY OCCUPATIONAL SURVEY PROGRAM (AOSP)

COMPREHENSIVE OCCUPATIONAL DATA ANALYSIS PROGRAMS (CODAP)
AOSP

- RESPONSIBILITY OF THE SOLDIER SUPPORT CENTER - NCR
- POLICIES COVERED IN AR 611-3
- ADMINISTRATION COVERED IN DA PAMPHLET 611-3
- USES THE AIR FORCE DEVELOPED CODAP SYSTEM
AOSP YEARLY OBJECTIVES

- APPROXIMATELY 50 ENLISTED INCUMBENT SURVEYS AND 30 TRAINING EMPHASIS SURVEYS
- APPROXIMATELY 40 COMMISSIONED OFFICER/WARRANT OFFICER INCUMBENT SURVEYS WITH APPROPRIATE TRAINING FACTORS
OCCUPATIONAL SURVEY DIVISION

- Determines yearly AOSP survey program
- Develops survey questionnaires in conjunction with schools
- Distributes questionnaires and answer booklets
- Monitors returns
- Hands screens answer booklets
- Maintains the occupational data banks
- Provides users with enlisted Codap reports
DATA ANALYSIS DIVISION

- PARTICIPATES IN QUESTIONNAIRE DEVELOPMENT
- PROVIDES TECHNICAL ADVICE AND CONSULTING SERVICES CONCERNING CODAP
- PROVIDES USERS WITH CODAP REPORTS ON OFFICER SPECIALTIES AND WARRANT MOS
- DEVELOPS OCCUPATIONAL SURVEY ANALYSIS REPORTS
COMPREHENSIVE
OCCUPATIONAL
DATA
ANALYSIS
PROGRAMS
CODAP

BASIC HISTORY:
- RESEARCHED BY US AIR FORCE 1960-1967
- DOD APPROVED FOR ARMY 1972
- USED BY ALL US ARMED FORCES (ITRO)
CODAP

METHOD:

- LARGE SCALE SURVEYS OF JOB INCUMBENTS AND THEIR SUPERVISORS
- COMPUTER PROCESSING OF SURVEY DATA
- ANALYSIS BY TRAINED SPECIALISTS OF THE PROCESSED RESULTS
FROM JOB INCUMBENTS
CODAP PROVIDES:

- Probability of task performance (percent performing)
- Average percent time spent by duty and task
- A profile (e.g., average paygrade, distribution by command and location, educational level)
- Equipment used, maintained, etc
- Importance of skills, knowledge, abilities, responsibilities, and physical characteristics
- Measures of job satisfaction, unit morale, and career intent
FROM SUPERVISORS/SME's

CODAP CAN PROVIDE:

- TRAINING EMPHASIS
- LEARNING DIFFICULTY
- CONSEQUENCES OF INADEQUATE PERFORMANCE
- TASK DELAY TOLERANCE
- OTHER FACTORS RELATED TO TRAINING DECISIONS
ARMY OCCUPATIONAL SURVEY PROGRAM (AOSP)

SCHEDULE CY 1981

PART I - Officer

PART II - Warrant Officer

PART III - Enlisted
<table>
<thead>
<tr>
<th>SPECIALTY</th>
<th>GRADES</th>
<th>DATE TO FIELD</th>
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<tbody>
<tr>
<td>11 - Infantry</td>
<td>04-06</td>
<td>Jul-Sep</td>
</tr>
<tr>
<td>12 - Armor</td>
<td>01-03</td>
<td>May-Jun</td>
</tr>
<tr>
<td>13 - Field Artillery</td>
<td>04-06</td>
<td>Jul-Sep</td>
</tr>
<tr>
<td>14 - Air Defense Artillery</td>
<td>01-03</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>15 - Aviation</td>
<td>01-03</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>21 - Engineer</td>
<td>01-03</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>27 - Communications-Electronics Engineering</td>
<td>01-06</td>
<td>Mar</td>
</tr>
<tr>
<td>31 - Law Enforcement</td>
<td>04-06</td>
<td>Jul-Sep</td>
</tr>
<tr>
<td>35 - Military Intelligence</td>
<td>01-03</td>
<td>Apr</td>
</tr>
<tr>
<td>36 - Counterintelligence, Signal Security, and Human Intelligence</td>
<td>01-03</td>
<td>Apr</td>
</tr>
<tr>
<td>41 - Personnel Programs Management</td>
<td>04-06</td>
<td>Oct-Dec</td>
</tr>
<tr>
<td>42 - Administrative and Personnel Systems Management</td>
<td>04-06</td>
<td>Oct-Dec</td>
</tr>
<tr>
<td>72 - Communications-Electronics Materiel</td>
<td>01-06</td>
<td>Feb-Mar</td>
</tr>
<tr>
<td>73 - Missile Materiel Management</td>
<td>04-06</td>
<td>Jul-Sep</td>
</tr>
<tr>
<td>81 - Petroleum Management</td>
<td>01-03</td>
<td>Apr-May</td>
</tr>
<tr>
<td>82 - Subsistence Management</td>
<td>01-03</td>
<td>Apr-May</td>
</tr>
<tr>
<td>82 - Subsistence Management</td>
<td>04-06</td>
<td>Oct-Dec</td>
</tr>
<tr>
<td>92 - Materiel/Services Management</td>
<td>04-06</td>
<td>Oct-Dec</td>
</tr>
</tbody>
</table>

TOTAL - 17 Specialties (18 Surveys)
## II WARRANT OFFICER SURVEY SCHEDULE CY81

<table>
<thead>
<tr>
<th>MOS</th>
<th>DATE TO FIELD</th>
</tr>
</thead>
<tbody>
<tr>
<td>201A - Meteorology Technician</td>
<td>Jul-Sep</td>
</tr>
<tr>
<td>211A - Target Acquisition Radar Technician</td>
<td>Jul-Sep</td>
</tr>
<tr>
<td>214GO - Missile System Technician, Lance (Organizational)</td>
<td>Jul-Sep</td>
</tr>
<tr>
<td>214GV - Missile System Technician, Lance (DS/GS)</td>
<td>Jul-Sep</td>
</tr>
<tr>
<td>221B - Missile Assembly Technician, Nike</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>222BO - Missile Fire Control Technician, Nike (Organizational)</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>222BV - Missile Fire Control Technician, Nike (DS/GS)</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>223BO - Missile System Technician, Hawk (Organizational)</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>223BV - Missile System Technician, Hawk (DS/GS)</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>224BO - Short-Range Air Defense Systems Technician (Organizational)</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>224BV - Short-Range Air Defense Systems Technician (DS/GS)</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>310A - Utilities Operation and Maintenance Technician</td>
<td>Jan</td>
</tr>
<tr>
<td>401A - Airdrop Equipment Repair Technician</td>
<td>Oct-Dec</td>
</tr>
<tr>
<td>621A - Engineer Equipment Repair Technician</td>
<td>Feb</td>
</tr>
<tr>
<td>711A - Personnel/Administrative Technician</td>
<td>Oct-Dec</td>
</tr>
<tr>
<td>761A - General Supply Technician</td>
<td>Oct-Dec</td>
</tr>
<tr>
<td>762A - Support Supply Technician</td>
<td>Oct-Dec</td>
</tr>
<tr>
<td>821A - Survey Technician</td>
<td>Mar</td>
</tr>
<tr>
<td>833A - Reproduction Technician</td>
<td>Jan</td>
</tr>
<tr>
<td>951A - Criminal Investigator</td>
<td>Jul-Sep</td>
</tr>
</tbody>
</table>

TOTAL - 16 MOS (20 Surveys)
### III ENLISTED SURVEY SCHEDULE CY81

<table>
<thead>
<tr>
<th>MOS</th>
<th>DATE TO FIELD</th>
</tr>
</thead>
<tbody>
<tr>
<td>008 - Diver</td>
<td>Nov-Dec</td>
</tr>
<tr>
<td>00E - Recruiter</td>
<td>Jun-Jul</td>
</tr>
<tr>
<td>00J - Club Manager</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>00U - Equal Opportunity NCO</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>03C - Physical Activities Specialist</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>11B - Infantryman</td>
<td>Mar</td>
</tr>
<tr>
<td>11H - Heavy Anti-armor Weapons Crewman</td>
<td>Mar</td>
</tr>
<tr>
<td>13F - Fire Support Specialist</td>
<td>Feb</td>
</tr>
<tr>
<td>16J - Defense Acquisition Radar Operator</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>16Z - Air Defense Artillery Senior Sergeant</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>21L - PERSHING Electronics Repairer</td>
<td>Sep-Oct</td>
</tr>
<tr>
<td>24H - Improved HAWK Fire Control Repairer</td>
<td>Nov-Dec</td>
</tr>
<tr>
<td>24J - Improved HAWK Pulse Radar Repairer</td>
<td>Nov-Dec</td>
</tr>
<tr>
<td>24M - VULCAN System Mechanic</td>
<td>Apr-May</td>
</tr>
<tr>
<td>24N - CHAPARRAL System Mechanic</td>
<td>Apr-May</td>
</tr>
<tr>
<td>26B - Weapons Support Radar Repairer</td>
<td>Jun-Jul</td>
</tr>
<tr>
<td>26D - Ground Control Approach Radar Repairer</td>
<td>Feb</td>
</tr>
<tr>
<td>26L - Tactical Microwave System Repairer</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>26T - Radio/Television Systems Specialist</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>26V - Strategic Microwave System Repairer</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>31N - Tactical Circuit Controller</td>
<td>Feb</td>
</tr>
<tr>
<td>31U - Tactical Communications System Operator/Mechanic</td>
<td>Feb</td>
</tr>
<tr>
<td>31S - Field General CONSEC Repairer</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>31E - Communications-Electronics Operations Chief</td>
<td>Feb</td>
</tr>
<tr>
<td>32F - Fixed Ciphony Repairer</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>32H - Fixed Station Radio Repairer</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>34F - DSTE Repairer</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>35K - Avionic Mechanic</td>
<td>Feb</td>
</tr>
<tr>
<td>35L - Avionic Communications Equipment Repairer</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>36L - Electronic Switching Systems Repairer</td>
<td>Aug-Sep</td>
</tr>
<tr>
<td>42B - Optical Laboratory Specialist</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>46M - PERSHING Electrical-Mechanical Repairer</td>
<td>Sep-Oct</td>
</tr>
<tr>
<td>51C - Structures Specialist</td>
<td>Apr-May</td>
</tr>
<tr>
<td>51T - Technical Engineering Supervisor</td>
<td>Jun-Jul</td>
</tr>
<tr>
<td>52E - Prime Power Production Specialist</td>
<td>Aug-Sep</td>
</tr>
<tr>
<td>54E - Chemical Operations Specialist</td>
<td>Apr-May</td>
</tr>
<tr>
<td>62F - Lifting and Loading Equipment Operator</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>62J - General Construction Equipment Operator</td>
<td>Sep-Oct</td>
</tr>
<tr>
<td>71P - Flight Operations Coordinator</td>
<td>Aug-Sep</td>
</tr>
<tr>
<td>71Q - Journalist</td>
<td>Jun-Jul</td>
</tr>
<tr>
<td>73D - Accounting Specialist</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>81B - Technical Drafting Specialist</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>81E - Illustrator</td>
<td>Oct-Nov</td>
</tr>
<tr>
<td>83E - Photo and Layout Specialist</td>
<td>May-Jun</td>
</tr>
<tr>
<td>91Q - Pharmacy Specialist</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>91S - Environmental Health Specialist</td>
<td>Jul-Aug</td>
</tr>
<tr>
<td>91T - Animal Care Specialist</td>
<td>May-Jun</td>
</tr>
<tr>
<td>93H - Air Traffic Control (ATC) Tower Operator</td>
<td>Aug-Sep</td>
</tr>
<tr>
<td>93J - ATC Radar Controller</td>
<td>Aug-Sep</td>
</tr>
<tr>
<td>95B - Military Police</td>
<td>Mar</td>
</tr>
</tbody>
</table>

**TOTAL - 51 MOS**
**CODAP POINTS-OF-CONTACT**

**WRITE:** Commander
**US Army Soldier Support Center**
**ATTN:** ATZI-NCR-MD
**Alexandria, VA 22332**

**TELEPHONE:** AUTOVON 221-0056/9272

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>PRIMARY</th>
<th>ALTERNATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Army Air Defense School</td>
<td>Ms. Toni Weir</td>
<td>Mr. Leslie Lord</td>
</tr>
<tr>
<td>US Army Armor School</td>
<td>Ms. Toni Weir</td>
<td>Mr. Alan Craig</td>
</tr>
<tr>
<td>US Army Aviation Center/School &amp; Ft Rucker</td>
<td>Ms. Peg Mercer</td>
<td>Mr. Gregg Dudding</td>
</tr>
<tr>
<td>US Army Chaplain Center &amp; School</td>
<td>Mr. Leslie Lord</td>
<td>Mrs. Susan German</td>
</tr>
<tr>
<td>US Army Chemical School</td>
<td>Ms. Peg Mercer</td>
<td>Mr. Dave O'Kane</td>
</tr>
<tr>
<td>US Army Engineer School</td>
<td>Mr. Alan Craig</td>
<td>Mr. Gregg Dudding</td>
</tr>
<tr>
<td>US Army Field Artillery School</td>
<td>Dr. Larry Goldman</td>
<td>Mr. Dave O'Kane</td>
</tr>
<tr>
<td>US Army Infantry School</td>
<td>Mr. Dave O'Kane</td>
<td>Mr. Leslie Lord</td>
</tr>
<tr>
<td>US Army Intelligence Center &amp; School</td>
<td>Mr. Dave O'Kane</td>
<td>Ms. Toni Weir</td>
</tr>
<tr>
<td>US Army Intelligence School-Devens</td>
<td>Mr. Dave O'Kane</td>
<td>Dr. Larry Goldman</td>
</tr>
<tr>
<td>US Army Military Police School</td>
<td>Mr. Leslie Lord</td>
<td>Dr. Larry Goldman</td>
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<tr>
<td>US Army Missile &amp; Munitions Center &amp; School</td>
<td>Dr. Larry Goldman</td>
<td>Ms. Toni Weir</td>
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<tr>
<td>US Army Ordnance School</td>
<td>Mr. Gregg Dudding</td>
<td>Mr. Alan Craig</td>
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<tr>
<td>US Army Quartermaster School</td>
<td>Mr. Leslie Lord</td>
<td>Mr. Dave O'Kane</td>
</tr>
<tr>
<td>US Army Signal School &amp; Ft Gordon</td>
<td>Mr. Gregg Dudding</td>
<td>Ms. Toni Weir</td>
</tr>
<tr>
<td>US Army Transportation School</td>
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<td>Ms. Peg Mercer</td>
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**INTEGRATING CENTERS**

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<td>Ms. Toni Weir</td>
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<tr>
<td>US Army Logistics Center</td>
<td>Dr. Larry Goldman</td>
<td>Mr. Leslie Lord</td>
</tr>
<tr>
<td>US Army Soldier Support Center*</td>
<td>Mr. Alan Craig</td>
<td>Dr. Larry Goldman</td>
</tr>
</tbody>
</table>

OTHERS

Defense Information School
Defense Language Institute
Defense Race Relations Institute
US Army Command & General Staff College
US Army Element of Music
Naval Amphibious Base
US Army Institute for Military Assistance
US Army Sergeants Major Academy
US Army Organizational Effectiveness Training Center
Academy of Health Sciences

PRIMARY

Mr. Alan Craig
Ms. Toni Weir
Ms. Peg Mercer
Mr. Dave O'Kane
Mrs. Susan German
Mr. Dave O'Kane
Mr. Leslie Lord
Ms. Peg Mercer
Mrs. Susan German

ALTERNATE

Mrs. Susan German
Mrs. Susan German
Mr. Leslie Lord
Mr. Alan Craig
Mr. Gregg Dudding
Mr. Alan Craig
Mrs. Susan German
Mr. Gregg Dudding
Ms. Peg Mercer

INCL 10

TITLE:
DISCUSSION GROUP
DISCUSSION GROUP LEADERS

MODELS:  Chief - Chap (LTC) Bridgeman
           Mr. Brady
           Mr. Foley

DATA:    Chief - LTC Kasper
           MAJ Mann
           Mr. Priest

TRAINING: Chief - Mr. Van Zante
           Chap (LTC) Craig
           MAJ Rock

TOPICS:

  FEA vs JTA and SAT all

  Model availability/selection

  Training needs for analyst (include SC 28, etc.)

  Data management thereof (include CODAP/AOSP/TDIS, etc.)
Chief - LTC Joe Kasper
Asst - MAJ Mann
Asst - Mr. Gary Priest

USAADS

BERGMAN, Joseph
BURK, Gary
COLLINS, Gary
CRICK, Paul
DAVISON, Jaquelin
DIEUDARDO, Joseph
DILG, James
GROTTIE, Mark
HAYS, Robert
KNIFFENBERG, Robert
LAKEMAN, Doris
LOWERY, Ray
MANN, Morris
NAKASHIMA, Miles
REDMAN, Jack
ROBERTS, Hugh
YOUNGBLOOD, Jesse
PRIVETT, Judy
TRAINING GROUP

Chief - Mr. Mark VanZante
Asst - Chap (LTC) Craig
Asst - MAJ Rook

DAVIS, Larry
FISHER, Edward
KELLAR, Vera
LONDONER, Carroll
NOLAN, John
PARKER, Frank
PIERSON, John
POND, George
ROMPF, Everett
SCHUYLER, Margaret
THOMAS, Thomas
VANDERLAAN, John

USASSC

VASSOS, Aggie
WHITE, Ray
WILLIAMS, Roy
MITCHELL, Dennis
PRYOR, Jack
KENDALL, Ray
BELANUS, Terry
WAGNER, Robert
STRATTON, James
BRITTAINE, Clay
DAVIS, Andrew
WORSTEIN, Darrell
MODELS GROUP

Chief - Chap (LTC) Bridgeman
Asst - Mr. John Brady
Asst - Mr. Bernie Foley

CHAP SCH

AEGETHER, Garth
AINSWORTH, Jack
BOLIN, Stan
COOPER, Clarence
DALTON, William
DILG, James
EUBANKS, Robert
EVANS, John
FELTON, James
FINCH, Curtis
FOLEY, Bernard
FRIETAG, Melvin
FULLER, Ralph
GOVER, Donald
GREER, William
HOBSON, George
HOFFMAN, Marianne
KOERIN, Phil

MONTGOMERY, Major
O'KELLEY, George
ROBINSON, Joe
ROSE, Leroy
ROWLEY, Cleve
RUBLE, William
RYAN, Art
SHARP, William
SIMS, Ronald
STUART, Walter
VANDEREN, Richard
VANDINE, Peter
WARD, Joseph
WEIR, Toni
WERNER, Susan
KELLEY, G. H.
BRITTAIIN, Clay
INCL 11

TITLE:

CONCEPTUAL MODEL FOR STORAGE, MANAGEMENT, AND
TRANSMISSION OF FEA DATA USING WORD PROCESSING EQUIPMENT
Mr. Silverberg presented a model for utilizing word processing equipment to store, manage and transmit analysis data. Data will be coded, entered and stored on disk in TRADOC Form 550 or equivalent format. An image generator program will display the entry format on the CRT screen for operator entry. Hard copies may be obtained by calling out of disk the desired data utilizing the entry code and printing it out in entry format. In the data transmission mode, data is outputed from the word processor into an interface buffer and then into a modum. The modum transmits the data on to an AUTODIN/AUTOVON line (depending upon data transmission rate). Data is processed in the reverse fashion on the receiving end. Cost per terminal for the interface buffer and modum is estimated at approximately $3,000 over and above the cost of the word processing equipment.
TITLE:
JTA VS FEA
"... AND IN THIS CORNER..."
TITLE: SAT
SAT

• FLEXIBLE
• LESSONS LEARNED
• LITERATURE
IV. SYSTEMS APPROACH TO TRAINING

A. Generic SAT Regulations

B. "How To" Tampers

C. Training Programs
TRAINING NEEDS FOR THE ANALYST
TRAINING NEEDS
FOR THE
ANALYST
TRAINING ANALYST

- NEEDS

I Baseline Training for the Analyst
II Alternative Modes of Training
III Specialty Codes / Identifiers
IV Systems Approach to Training (SAP) Package
V Front-End Analysis (FEA) vs. Job-And-Task Analysis (JATTA)
BASELINE TRAINING FOR THE ANALYST

A. Minimum Competencies

B. Train For All levels Within The Analytical Structure

C. Identify Principles Common To All Models
I. ALTERNATIVE MODES OF TRAINING
   A. Staff and Faculty
      1. For the School/Training Center
      2. For the S & F Trainer
   B. Use of Contractor Training
   C. OJT
   D. Short Term Civilian Training
   E. Centralized Training
   F. TRADOC Seminars
III. SPECIALTY CODES/IDENTIFIERS

A. SC 28

B. SOI For Enlisted/NCO

C. WO Identifier

YES

NO
INCL 15

TITLE:
DATA MANAGEMENT
DATA MANAGEMENT

IMPACTING FACTORS

VOLUME/SHEER BULK OF PAPER
PERSONNEL TURBULENCE
LACK OF INSTITUTIONAL MEMORY
PROGRAM COMPLEXITY AND DETAIL
RESOURCE CONSTRAINTS

EXPENSIVE BUT ESSENTIAL REQUIREMENT
DATA MANAGEMENT

PERCEPTIONS

- Improvements in storage/access of task documentation and audit trail information are needed.

- Organic capability to manipulate specialty/MOS-related task data is necessary.

- Computer applications ("datamatics") to training development possess the potential to be a tremendous asset to the TD community - dependent on certain actions.
DATA MANAGEMENT

RECOMMENDATIONS

CONDUCT TD ADP SEMINAR

ESTABLISH POCs FOR TNG DEVELOPMENT ADP DEVELOPMENT PLANNING

DETERMINE SHORT RANGE / INTERIM ADP GOALS

DETERMINE LONG TERM GOALS
INCL 16

TITLE:

TRAINING WEST
TRAINING Magazine's First Annual

TRAINING WEST

Spring Conference & Expo
April 13-16, 1981
Disneyland Hotel, Anaheim, CA

• 10 compelling reasons you shouldn't miss this conference—Page 2

• With so many national conferences available, why pick this one?—Page 5

• Who attends conferences like this anyway?—Page 7

• Complete seminar/workshop program at a glance—Page 14

• Why April in Anaheim can't be beat—Page 28

• “I'm already sold! Where's the registration form?”—Page 27

SEE INSIDE FOR DETAILS ON 99 SEMINAR/WORKSHOPS
WHY YOU OWE IT TO

TRAINING WEST: TRAINING MAGAZINE'S FIRST ANNUAL SPRING CONFERENCE AND EXHIBITION
APRIL 13-16, DISNEYLAND HOTEL, ANAHEIM

Entering their fifth year, TRAINING Magazine's Annual Conferences have become generally recognized as the most powerful and comprehensive events in the Human Resources Development field.

Now we've got some exciting news! You have a choice of locations where you can plan to attend TRAINING's annual conference and exhibition: TRAINING WEST will take place April 13-16, 1981, at the Disneyland Hotel in Anaheim, California. Although it's modeled after our successful conference held annually in early December in New York City, TRAINING WEST will not be a carbon copy. Indeed, research by TRAINING's editors and conference planners indicates that the WEST seminar workshop program will be excitingly different. By all means, the best sessions of TRAINING's previous conferences will be repeated, but dozens of new workshops are being designed specifically for this event, some of them never before available on the West Coast.

TRAINING's annual conference moves to the West Coast because you asked for it. In a recent survey of West and Midwest readers of TRAINING, over 60% of the respondents indicated they would attend a West Coast event sponsored by TRAINING. In response to that request, TRAINING's editors have planned TRAINING WEST to coincide with a school vacation period (the week before Easter), offering you the opportunity to bring your family and extend your stay in Anaheim. The site, the fabulous Disneyland Hotel, combines the best in convention facilities with direct monorail access to one of the world's largest and best playgrounds, Disneyland.

Here's why you owe it to yourself and your organization to attend:

1 YOU PAY ONLY FOR SESSIONS YOU ACTUALLY ATTEND. You do not have to sign up for the full four days, and may register for as few as one or as many as eight of the more than 90 seminar workshops offered.

2 TRAINING WEST OFFERS AN IMPROVED LEARNING ENVIRONMENT. Not only are the meeting facilities at the Disneyland Hotel first rate, but several features of the seminar workshop program combine to provide a good learning climate. For example, attendees preregister, and speakers are told two weeks before the conference whom their sessions' attendees will be. This helps speakers tailor their presentations to your needs.

3 YOU CAN CHOOSE FROM SCORES OF WORKSHOPS ON THE EVER-IMPORTANT BASICS: How to design instruction for adults; what we know about the way adults learn, how to plan and run better meetings; training first-line supervisors to be better on-the-job counselors, how to measure and evaluate training effectiveness. The sessions on the what's, why's, and when of classroom training will range from a workshop on how to improve your platform skills to a session on instructor training. Leading specialists from throughout the nation will conduct sessions on training with media, many of them structured as hands-on workshops. Examples: making video creative without spending money, how to produce effective radio and video programs, the new videodisc and how it can help trainers. How to get the most out of using printed materials, and writing for the eye and ear.

4 MANY SESSIONS DEAL WITH PERFORMANCE AND PRODUCTIVITY IMPROVEMENT. You'll be able to learn the whys and hows of managing stress for organizational productivity. Hear members of the Woodlands Group, a "think tank" of trainers, put the productivity crisis into perspective for HRD. Plus, there'll be useful sessions on management and supervisory development; sessions on various aspects of organization development topics, in selection, placement and career development, sales management and training, and topics specifically related to helping training and development executives improve the ways they currently stress classroom and market training and development in their organization . . . and much, much more!

5 YOU CAN MEET AND EXCHANGE IDEAS WITH YOUR PEERS. The exhibition, the special evening functions, and the more than 90 sessions help attendees meet and rap with the 75 faculty members and more than 200 exhibitor personnel and, of course, other attendees from a wide variety of organizational settings.

6 THE FREE EXHIBITION OFFERS A GOLDMINE OF USEFUL AIDS AND INFORMATION. You'll see the technological innovations that are dramatically chang-
ASONS YOURSELF TO ATTEND

ing training — the latest advances in hardware, software and services that can make your job easier and more productive. You’ll meet many of the industry’s major suppliers and key management personnel. They’ll be eager to show you how their products, services and equipment can help you control costs, operate more efficiently and grow in today’s competitive environment.

7 FREE FILM FESTIVAL
You will have an opportunity to view the latest off-the-shelf training films and videotapes at the free Film Festival. The best from previous Training Film Festivals will augment the premiere showings for many new releases.

8 EVENING EVENTS PROMISE FUN AND LEARNING.
Larry Wilson will address attendees on the topic of wellness late Monday afternoon. Tuesday evening is the gala wine and cheese reception for all attendees, speakers and exhibitors. And on Wednesday evening Ronald Zemke will discuss why training departments and HRD functions of some organizations grow and prosper while others flounder and fail.

9 FREE SPECIAL EVENT TICKETS FOR MULTIPLE SESSION REGISTRATION. If you register for four or more seminar/workshops, you will receive free tickets to the Monday, Tuesday, and Wednesday special events plus tickets to Disneyland for Thursday evening, April 16.

10 YOU’LL GET A FREE SUBSCRIPTION (OR RENEWAL) TO TRAINING MAGAZINE. Everyone who attends at least one session receives a one-year subscription (worth $24) to TRAINING, The Magazine of Human Resources Development.

CALENDAR OF EVENTS

SEMINAR/WORKSHOPS
Monday, Tuesday, Wednesday and Thursday, April 13-16.
Morning sessions: 9:00-11:30 a.m. Afternoon sessions: 1:00-3:30 p.m.
(Except as otherwise noted in the session descriptions.)

SPECIAL EVENING EVENTS
Monday, April 13 6:00-7:00 p.m. Larry Wilson
Tuesday, April 14 6:00-7:30 p.m. Wine & Cheese Reception
Wednesday, April 15 6:00-7:00 p.m. Ronald Zemke
Thursday, April 16 6:00 p.m. Disneyland Night

FILM FESTIVAL
Tuesday, Wednesday and Thursday evenings, April 14, 15 and 16

EXHIBITION HALL
Tuesday, April 14 11:30 a.m.-6:00 p.m.
Wednesday, April 15 11:30 a.m.-6:00 p.m.
Thursday, April 16 11:30 a.m.-6:00 p.m.

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14 Complete Seminar/Workshop Schedule at a Glance
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20 Thursday PM Seminar/Workshops
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22 Special Evening Events
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26 Registration Information and Form

MAIL FORM ON PAGE 27 WITHOUT DELAY!
SEMINAR/WORKSHOPS

TUESDAY
APRIL 14
1-3:30 P.M.

USING GAMES AND SIMULATIONS TO DEVELOP MANAGERIAL SKILLS
Faculty: Dr. Scott B. Parry, president, Training House

During this session attendees will design a simulation and play two management games. Highly participative, this session illustrates Dr. Parry's fundamental thesis: that people learn best not by being told, but by experiencing the consequences of their own actions. Attendees will leave with an ability to select and/or develop management games and simulations and the ability to fill the role of a catalytic, process-oriented instructor in administering them.

HUMAN FACTORS IN PRODUCTIVITY: WORKING FOR A LIVING
Faculty: Rob Wall, president, Productivity Products, Inc.

Working for a living can be a creative, rewarding and enjoyable experience for both the employer and the employee. This session will show trainers how measurement of work and workers and employee satisfaction can be integrated. Questions to be answered will include:

• What can we learn from other countries, such as Japan?
• How can supervisors and managers measure white and "open" collar performance?
• How can training be modularized? Plan to participate in structured exercises. Handouts will be provided.

MAKING THE MOST OF PRINTED MATERIALS
Faculty: Stephanie Jackson, vice president, Operants, Inc.

Print is both the most common and the most versatile training medium in use today. Too often, however, trainers and instructional writers look on it as a limited, somewhat "old fashioned" medium. In fact, some of the most innovative training systems available today use only the worker, the workplace and printed materials. To achieve a high level of impact with written material, however, requires more than just getting the information down on paper correctly. Research and practical experience have produced a number of rules and guidelines for producing effective written materials. This workshop won't turn you...
SEMINAR/WORKSHOPS

TUESDAY
APRIL 14
1-3:30 P.M.

into a great writer in three hours. What it will do, however, is teach participants to:

- Decide when and how to use printed materials to support performance.
- Select appropriately from among the many types of print materials available.
- Review printed materials, whether your own or others, for such characteristics as audience appeal, instructional appropriateness, format, use of graphics, etc.

The workshop will include presentation, examples and participant exercises. Participants will receive a job aid handout containing guidelines for making decisions about the choice of printed materials and for reviewing (or writing) printed materials.

This session will also be offered Wednesday morning. See Session 506.

This session will run from 1-4:00 p.m.

JOB AIDS ANALYSIS, PART 1: DECIDING IF THEY ARE APPROPRIATE
Faculty: Claude Lineberry, president, Performance Design Corp., and co-author of Job Aids

Key to the cost effectiveness of training is the use of job aids to guide on-the-job performance — in addition to instruction on job-related skills and knowledge. This session will focus on analysis of job performance to determine the appropriateness of job aids as part of the training solution and design of the job aids to be utilized.

An application session, "Job Aids Analysis, Part 2: Developing and Evaluating," will be offered Wednesday morning. See Session 407. A separate registration fee is required for each part of this program.

DESIGNING INTERACTIVE VIDEO PROGRAMS
Faculty: Steve Floyd, writer/producer, Texas Instruments

Participants in this session will learn how to use instructional design principles to plan and develop interactive video programs. A case study example will be used to demonstrate the techniques of computer/video-based interactive formats. Participants should be familiar with basic media production and have an understanding of instructional design theory.

SELECTING AND USING THE RIGHT TASK ANALYSIS/NEEDS ANALYSIS TECHNIQUE
Faculty: Ron Zemke, research editor, TRAINING Magazine, and president, Performance Research Associates

Most trainers only learn one or two ways of doing task and/or needs analysis. In this session, ten task/needs analysis techniques will be discussed. Criteria for successful needs and task analysis studies will also be reviewed. Recommended for trainers with a minimum of two years experience. Registrants are urged to read Analyzing Performance Problems by Mager and Pipe (Fearon, 1970) prior to the session.

A SIMPLIFIED APPROACH TO INSTRUCTOR TRAINING
Faculty: Martin Broadwell, corporate partner, Resources for Education & Management, Inc.

The challenge is to take qualified content and make satisfactory instructors out of them. The approach is to find those things which will give the new instructors enough skill and confidence that they can do a competent job, until they get the experience to actually know the best techniques. When this is combined with a design that centers the instruction around the learners instead of the teachers, we have a means of getting the job done just as though we had professional trainers. This session will give instructor trainers a method to use in developing such a group of trainers.

HOW TO BUILD AND MAINTAIN YOUR OWN FULL-TIME/PART-TIME CONSULTING PRACTICE
Faculty: Howard L. Shenon, author of numerous books on consulting and publisher of The Professional Consultant, a newsletter on the consulting profession

Special all-day session. For a complete description, see Session 311.

STRATEGICALLY POSITIONING HRD IN YOUR ORGANIZATION
Faculty: Olaf Isachsen, president, Institute for Management Development, a consulting group and clearing house for training and development programs

Human resource development people often feel that they lack real organizational impact and that they are overlooked as an important organizational resource. But HRD can become an effective organizational tool if appropriately positioned with senior management. This session will focus on moving HRD from the background role it often plays into one of vital impact on overall corporate performance. Session attendees will explore various methods of achieving a results-oriented positioning of HRD.

INTEGRATING STRATEGIC AND MANPOWER PLANNING
Faculty: Geary Rummler, vice president and managing director, Kepner-Tregoe, Inc.

Training and development should be a key element in an organization's strategic planning, but it seldom has been. Rummler will explore the reasons for that situation, the steps human resources development people can take to change it and the changes HRD people will have to make in their own behavior in order to succeed.

POSITIVE DISCIPLINE
Faculty: Richard C. Grote, president, Performance Systems Corporation, and author of Positive Discipline

Organizations have many ways of dealing with employees who miss too many days, do poor quality work, break organizational rules or create other kinds of trouble. But the basic steps remain the same. With traditional approaches, employees are expected to become better by being treated progressively worse. Positive Discipline is the alternative approach developed by Grote that maintains discipline without punishment. Positive Discipline has received national publicity because of its effectiveness in reducing absenteeism, terminations and grievances and increasing supervisory self-confidence. Grote will explain the concept, demonstrate the procedures and share the experiences of the growing number of organizations who are adopting this tough-minded, humanistic approach.
### At a glance, the entire set

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<tr>
<th>Date</th>
<th>Time</th>
<th>Title</th>
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<td>Trends in Career Management</td>
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<td>Interviewing Skills Workshop</td>
<td>Managing Your Manager - The Effective Subject</td>
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<td>Designing and Implementing Upward Mobility Programs</td>
<td>Training as an Inner Game</td>
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<td>Integrating Strategic and Manpower Planning</td>
<td>Using Games and Simulations to Develop Management Skills</td>
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<td>Interviewing Skills Workshop</td>
<td>Getting Your Act Together: Goal Setting For Fun, Health and Profit</td>
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<td>Designing and Implementing Upward Mobility Programs</td>
<td>Training Supervisors to be Better Counselors on the Job</td>
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<td>Integrating Strategic and Manpower Planning</td>
<td>How to Effectively Use Formative and Summative Feedback</td>
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<td>Interviewing Skills Workshop</td>
<td>Building A Performance Engineering Department</td>
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<td>Designing and Implementing Upward Mobility Programs</td>
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<td><strong>TUESDAY</strong></td>
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<td>Designing and Implementing Upward Mobility Programs</td>
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<td>Interviewing Skills Workshop</td>
<td>Human Factors in Productivity: Working for a Living</td>
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<td>Designing and Implementing Upward Mobility Programs</td>
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<td>9-11:30 A.M.</td>
<td>Helping Others Learn From Conflict</td>
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<td>1-3:30 P.M.</td>
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<td>Strategies for Implementing and Maintaining a Matrix Organizational Structure</td>
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<td>Staff Consulting Skills Workshop</td>
<td>Why Management Development Programs Fail and How to Prevent It</td>
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<td>Designing and Implementing Upward Mobility Programs</td>
<td>The Productivity Crisis: New Perspectives</td>
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<td>Staff Consulting Skills Workshop</td>
<td>Job Aids Analysis Part II: Developing and Evaluating</td>
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<td>Designing and Implementing Upward Mobility Programs</td>
<td>Organizing, Staffing and Managing the Technical Training Function</td>
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<td>Staff Consulting Skills Workshop</td>
<td>Productivity: New Directions</td>
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<td>Staff Consulting Skills Workshop</td>
<td>How to Select Media for Technical Skills Training</td>
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<td><strong>THURSDAY</strong></td>
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<td>Human Resource Planning: From Concept to Reality</td>
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<td>1-3:30 P.M.</td>
<td>Getting Started in Organizational Development</td>
<td>How to Teach Managers to Get Work Done in Meetings</td>
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<td>Staff Consulting Skills Workshop</td>
<td>Productivity - How to Make It Happen in Your Organization</td>
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**NOTE:** Some sessions last longer than 2½ hours. See individual session descriptions for exceptions.
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<th>DESIGNING TRAINING</th>
<th>CONDUCTING AND EVALUATING TRAINING</th>
<th>STRUCTURING, MANAGING AND MARKETING THE HRD FUNCTION</th>
<th>GENERAL INTEREST</th>
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<td>108: Getting Results from Surveys and Questionnaires</td>
<td>108: How to Sell Your Training Programs to Higher Management</td>
<td>109: Building Your Personal Resource Network</td>
<td>9:00-7:00</td>
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<td>208: Behavior Modeling How to Develop It and Use It</td>
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<td>209: The Consulting Process</td>
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<td>514: Videotaping and Scripting Training Programs</td>
<td>517: Applying Instructional Design Principles to Any Type of Training</td>
<td>518: Comprehensive Consultation: A Model for the Personnel Function</td>
<td>311/411: How to Build and Maintain Your Own Full Time/Part Time Consulting Practice</td>
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<td>518: Strategic Positioning HRD in your Organization</td>
<td>311/411: How to Build and Maintain Your Own Full Time/Part Time Consulting Practice</td>
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<td>706: How to Make Instructional Computing Work: Basic Information for the Inexperienced</td>
<td>716: Customizing Off-The-Shelf Programs</td>
<td>718: How to Conduct a Training Program Audit</td>
<td>719: A Guide to Strategic Planning in HRD</td>
<td>11:30-5:00 Film Festival (Time to be announced)</td>
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<tr>
<td>706: How to Make Instructional Computing Work: Basic Information for the Inexperienced</td>
<td>718: How to Conduct a Training Program Audit</td>
<td>719: A Guide to Strategic Planning in HRD</td>
<td>714: Meet the Producers: A Dialogue Between Filmmakers and Film Users</td>
<td>11:30-5:00 Film Festival (Time to be announced)</td>
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<td>804: Writing for the Ear and Eye</td>
<td>807: An Overview of Evaluation: A Beginner’s Guide</td>
<td>809: Developing Brain Power</td>
<td>11:30-5:00 Film Festival (Time to be announced)</td>
<td>8:00 Night at Disneyland</td>
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Special Hotel Rates for TRAINING WEST Participants

If you are coming to the show from out of town, you can obtain special — and lower — room rates at the Disneyland Hotel. To assure these special rates, you must use this form (or a photocopy of the form). Mail it directly to the Reservations Manager.

To: Reservations Manager
DISNEYLAND HOTEL
1150 West Cerritos Avenue
Anaheim, California 92802

(please type or print)

FOR:

Company
Address
City/State/Zip

Sharing room with

Please reserve accommodations as circled:

Accommodations
Single (One Person) $70.00
Twin (Two Persons) $84.00
Double (Two Persons) $84.00
Triple/Quad $84.00
Suites On Request
Rollaways $8.00
Plus 5% City Tax

Please enclose first night’s rental as deposit. Refundable only if hotel is notified 5 days before arrival date.

Arrival Date: ____________________

Before 6 p.m. _______ After 6 p.m. (Gtd.)

Length of Stay _______ Nights

Reservations not guaranteed if not received by March 18, 1981.
**REGISTRATION FORM**

Please type or print clearly — use separate form for each registrant.

<table>
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Write the session numbers of your choice in the appropriate boxes — please print clearly.

- **Monday, April 13**
  - 9-11:30 a.m. (Session #1: 101-109 only)
- **Tuesday, April 14**
  - 9-11:30 a.m. (Session #2: 301-317 only)
- **Wednesday, April 15**
  - 9-11:30 a.m. (Session #3: 501-514 only)
- **Thursday, April 16**
  - 9-11:30 a.m. (Session #4: 701-714 only)

**SEMINAR/WORKSHOPS**

Advance Registration (postmarked with payment by March 27, 1981)
- 1st seminar @ $60
- additional seminars @ $50

Regular Registration (postmarked with payment after March 27, 1981)
- 1st seminar @ $70
- additional seminars @ $60
- Special Events Package @ $30

I would like _______ individual tickets to the M. T. W. special events ( @ $10 each).________ 

I have registered for four or more seminars. _________

Please send me _______ additional FREE Exhibit Hall registration forms. Total Amount Enclosed $________

IMPORTANT: Please check all appropriate boxes. Your answers will help the faculty of the sessions you sign up for tailor their presentations to your background and that of the other attendees.

**My Role in Training & Development**

- 1. Part-time responsibility (2) Career position in HRD (4) Other
- 2. 1-2 hours per week (3) 3-4 hours per week (4) Other

**My Major Job Function Is**

- 1. Department Manager (2) Classroom Instructor (3) Other

**Total Number of Employees in My Organization**

- 1. Over 1,000 (2) 100-299 (4) Other
- 2. 500-999 (5) 50-99 (6) Under 50

If you are charging your registration to a credit card, please complete this section.

Check one: 

- Visa 
- Master Charge

EXPIRATION DATE 

For Office Use Only

**Enclose Total Remittance With This Form**

Make checks payable to TRAINING WEST and mail to TRAINING WEST Seminar Director, Conference Management Corporation, 588 Summer Street, Stamford, CT 06901.
REGISTER TODAY . . . SAVE MONEY AND BE ELIGIBLE TO WIN A TRIP TO MEXICO

You'll save money by registering in advance. Your early registration also insures your admittance to the Seminar/Workshops of your choice. Attendance in many sessions is limited.

Use the Registration Form on opposite page to register for sessions and/or obtain forms for admission to the Exhibition Hall. The form may be photocopied for additional registrants.

Advance Registration
Prior to March 27, 1981
$50 for the first session and $50 for each additional session attended by the same person. In order to qualify for the above rates, registration (with payment in full) must be postmarked by March 27, 1981.

Early Registration Suggested
Since the size of many sessions is limited, we advise early registration to assure a place in the programs of your choice.

Registrations will be accepted in the order they are received.

Regular Registration
After March 27, 1981
$70 for the first session. Each additional session attended by the same individual: $60.

Win a Free Trip to Mexico City
If your seminar registration is received before March 27, you will be eligible for the Grand Prize drawing of an expense-paid trip to Mexico City — another good reason for registering early. A special Prize ticket will be mailed to you in advance of your arrival at the Disneyland Hotel. The drawing will be held at the show, time and place to be announced. (At-the-door or late mail registrants will not be eligible for the Grand Prize.)

Special Evening Events
• If you register for four or more seminars/ workshops, you'll receive FREE tickets to the four special evening events: Larry Wilson, the Wine and Cheese Reception, Ron Zemko, and Disneyland.
• If you register for fewer than four seminars/ workshops, you can purchase the special events package at a discount rate of $30 for all four events.
• If you'd like individual tickets to Larry Wilson, the Wine and Cheese Reception or Ron Zemko, they can be purchased for $10 for each event. Individual tickets to Disneyland are not available through this brochure but may be purchased at the gate.

See page A22 for complete details on the special evening events.

Visa and Master Charge
You have the option of charging your registration fees to your Visa or Master Charge account. Simply complete that section of the Registration Form on the opposite page.

Note: Anyone registering for one or more sessions will receive a one-year subscription (worth $24) to Training: The Magazine of Human Resources Development. Individuals already subscribing to Training in their own name will receive a one-year extension to their subscription.

Confirmation and Tickets
Your seminar/workshop confirmation will be mailed to you if advance registration and payment are postmarked by March 27. Session tickets can be picked up at the Registration Desk at the Disneyland Hotel starting at 7:30 a.m., April 13-16.

Cancellations
Cancellations with full refund accepted only if cancellation notice is postmarked by March 9, 1981. After that, the fee, less $10 per session, is transferable to any other 1981 or 1982 TRAINING conference.

Time Schedule
Morning sessions will start promptly at 9 and will end at 11:30. Afternoon sessions will start promptly at 1 and end at 3:30.

Information on specific room assignments will be available at the hotel.

Accommodations
A block of rooms has been set aside at the Disneyland Hotel at special lower rates for attendees. In order to qualify for these lower rates, you must use the special Hotel Reservation form which appears on page A21 in this brochure.

Tax Deduction of Expenses
An income tax deduction is allowed for expenses of education (including travel, meals and lodging) undertaken to maintain and improve professional skills. (See Treasury Reg. 1:162-5; Coughlin v. Comm. 203F. 2nd 307.)

Free Exhibit Hall Seminar registrants will automatically receive Exhibit Hall admission badges with their tickets. To register for the Exhibit Hall only, complete the form on the opposite page and bring it with you to the Exhibit Hall Registration Desk. (Do not mail.)
INCL 17

TITLE:

THE CROSS-TRAINING OF SUBJECT MATTER EXPERTS
AND INSTRUCTIONAL TECHNOLOGISTS
The Cross-Training of Subject Matter Experts and Instructional Technologists

Marc J. Rosenberg
Bell System Center for Technical Education

Today, more than ever, organizations are increasing their investment in training. Of all the resources devoted to this effort, the contribution of full-time personnel to training endeavors is perhaps the most significant. The emphasis on instructional and performance technology as a foundation for training development is increasing as well. To effectively integrate instructional technology skills with subject matter expertise is a major goal of an organization's training function. In order for these skills to be effectively applied to training development, it becomes important for subject matter experts (SMEs) to learn the basics of instructional technology and for instructional technologists (ITs) to gain an understanding of the relevant content areas they work with. Successful training development is usually associated with effective teamwork between development personnel. How each member of the team comes to understand the activities and contributions of other team members is critical to that success. It should be noted that the purpose of cross-training is not to create a situation of dual expertise in the team members. Clearly, each member must remain at the cutting edge of knowledge and ability in his/her field; to pursue such a high level of expertise in another field which clearly goes beyond a basic level of understanding would be inappropriate from the viewpoint of effective and efficient training development.

Training the SME in Instructional Technology

The systematic approach to the development of effective training programs can be a frustrating experience for the new SME who may have little experience with the field. SMEs may find their perceptions of these new development processes in conflict with past training experiences. Training organizations should recognize this and seek to assess the SME's initial background and understanding of the field, provide a working climate where the lack of appropriate skills is viewed as non-threatening, and make the SME aware of the organization's concern for improving his/her skills.

With a positive organizational environment established, programs for providing the SME with instructional technology skills can be implemented. Such programs may include a variety of approaches:

Direct Training Instructional Technology

Here the SME participates, either part time or full time, in courses, workshops, and seminars designed to improve a variety of skills. Such programs can be developed in a number of ways:
- In-House Programs. A train-the-trainer curriculum can be established on site. Courses are developed through consultation/purchase from outside sources, contracts with local educational institutions, or through the internal course development activities of an instructional technology staff. Such a curriculum would include formalized classes, independent study, observation, and practical exercises and experiences. Comprehensive in-house training can be expensive and would, in most cases, require a relatively large potential population to justify costs. Yet such programs can be specifically designed to meet the needs of the organization and SMEs involved.
- Outside Vendors. The SME can receive instructional technology training through attendance at various workshops and seminars sponsored by outside vendors, universities, or professional associations. The availability and variety of such programs provides easy access to the organization which purchases "seats" for their people. While far less expensive than in-house training, outside vendor offerings will be less "industry-specific" (more generic) than the in-house program.

Academic Training. Enrolling SMEs in university courses and degree programs can provide an effective approach if local universities have adequate program offerings to meet the need. It is important to examine these programs carefully to match the program to the organization's goals. If there are a sufficient number of potential participants, new or altered courses which are more in line with those goals might be negotiated with the university. In addition, the university may agree to deliver the courses at the work site. A well established program in instructional technology may offer a wide variety of courses of interest. However, such a variety must be balanced with a relatively extended length of time required for completion. Also, while enrollment in some specific courses may be appropriate, the participation of an SME in an entire instructional technology program will probably be predicated on a complete re-evaluation of the career path of the SME and a decision by the organization as to where the efforts of the SME would be most valuable in the future. Only for SMEs who expect to spend a major portion of their future careers in a training environment and who see themselves as becoming instructional technologists, would a total academic program be advisable.

Consultation

In addition to direct training, consultation can provide a means for training SMEs in instructional technology. If the organization has a staff of instructional technologists, effective consultation arrangements can be established. Such consultations may revolve around a project under the joint development of an SME (or SME group) and an IT, or by using the IT as an advisor to a group of SMEs.
SMEs. In the absence of an internal instructional technology staff, the organization can hire outside consultants from specialized consulting firms or from academic institutions.

The consultant's contribution can range from occasional instructional technology advice to an active and regular participation on a training project. The SME learns about instructional technology through exposure to the consultant's skills. The consultant teaches the SME how to assume some facets of the IT's role. Essential to this relationship, however, is the fact that although the SME begins to apply some instructional technology skills, the consultant remains as an essential part of the working relationship although the role of the consultant may change from a direct product orientation, to an indirect advisory role.

The establishment of internal instructional technology staffs is clearly more expensive than hiring outside consultants and probably not justified when the organization's contribution to the training effort consists mostly of part-time SMEs and support personnel. However, as the commitment to training, especially training personnel, grows to a full-time basis, the communications problems which in- terrupt the working relationship and the quality of the work delivered will be better able to communicate with SMEs throughout the instructional development process. Two alternatives are offered here:

Consultative Role

The IT can apply effective consulting skills to help SMEs define and specify the content scope of the instructional project. Through the application of learning hierarchies, task analysis, and other techniques, the IT should gain an insight into the subject area such that it can effectively reduce or eliminate the communications problems which inhibit the effective teamwork necessary for a successful working relationship.

Successful ITs are those who recognize the importance of consultation skills. These ITs have some training or experience in the application of these skills, and who use these skills to learn as much as is necessary about the content area to get the development job done. Clearly, SMEs who perceive that the other members of the team have a genuine interest in their areas of expertise will be more positively oriented towards the input coming from those team members.

Providing Subject Matter Understanding to the Instructional Technologist (IT)

Most organizations realize that the SME's value lies in his/her technical knowledge, backed by years of experience and superb job performance. To set this value aside in pursuit of complete mastery of a second set of professional skills negates the large investment in the SME's expertise. This is essentially why there is a point of diminishing returns in any attempt at total transfer of instructional technology skills to the SME, and why it is very difficult to find SMEs who are expert in their technical fields and in instructional technology. Therefore, it is probably not in the best interests of the organization to make instructional technology professionals out of SMEs; nor is it very likely that all the instructional technology needs of industry or government could be met by people with appropriate technical backgrounds. It thus becomes advisable to suggest some ways for the majority of ITs hired by industry to become acquainted with the content areas in which they work so that they will be better able to communicate with SMEs throughout the instructional development process. Two alternatives are offered here:

Consultative Role

The IT can apply effective consulting skills to help SMEs define and specify the content scope of the instructional project. Through the application of learning hierarchies, task analysis, and other techniques, the IT should gain an insight into the subject area such that it can effectively reduce or eliminate the communications problems which inhibit the effective teamwork necessary for a successful working relationship.

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Researching the Content Area

Another approach for providing an opportunity for gaining an awareness of subject matter is for the IT to do as much of the pre-development research as possible. Such research might take the form of a front-end analysis, needs assessment, or other investigative and data gathering practices such as interviewing, content analysis of documentation, and orientations to working environments, products/services, policies and philosophies of the organization. Through these activities, the IT learns for themselves what they need to know about the content areas they are about to develop instruction for.

Neither of these two approaches, consultation and research, is meant to stand alone. More often than not, these techniques are used together, so that the IT learns to ask the right questions in an effort to bring out information from the SMEs which is critical to successful instructional development.

A Large Scale Example

The Bell System Center for Technical Education, near Chicago, is one of the largest training centers in the country. It employs an SME staff, recruited on a rotational basis from the various telephone operating companies around the country. Its IT staff is permanently located at the Center and works closely with the SMEs in course development.

The Center uses a variety of methods to acquaint SMEs with instructional technology. It maintains a train-the-trainer curriculum, developed in part by the IT staff and in part by outside vendors. An instructional technology curriculum path is established for the SMEs who normally spend from one to three weeks a year in IT related training. Most of the fundamental instructional technology skills are taught through these courses, and while the SME is not expected to perform all tasks in an expert-like manner, the training does afford a basis for effective communication between the IT and SME. Of course, the SME is expected to keep abreast of technical developments in his/her field and the Center provides extensive assistance in this area as well. In addition, the instructional development process is set up so that it fosters a great deal of communication between the SME and IT. Team members are required to work independently and as a group on all aspects of training development. Thus the SME has considerable opportunities to observe and contribute to the instructional technology component of the project.

ITs also have opportunities to learn about the content area in which they work. Through a phase of the development process called the Job Study, ITs are required to investigate and document various aspects of the job for which training will be designed. This process requires both research and communication skills as the ITs gain information about performance problems, target population, job tasks, etc. through a number of well specified procedures. Extensive interviewing is usually called for, which allows the IT an opportunity to communicate directly with job performers. Additional information about the content area is gained when the IT performs an editing function on lesson materials provided by the SMEs.

(continued on page 33)
Cross-Training
(continued from page 17)

Thus through a combination of instruction, consultation, and research, SMEs and ITs at the Bell System Center for Technical Education do learn about each other's worlds. And it is this cross learning, as much as any other aspect of training development at BSCTE, that contributes to project success.

Conclusions and Recommendations

Of course, very few organizations are as large as the Bell System or have such extensive training facilities and resources. However, the approaches outlined in the BSCTE example, along with other approaches suggested in this article, can be instituted at a variety of levels and scales depending on the size and commitment of the individual organization. In this light, it is possible to specify a number of general recommendations about the cross-training of SMEs and ITs:

1. Establish a program to acquaint SMEs with instructional technology concepts and practices which is consistent with the ready availability of an IT staff and within the resource limitations of the organizations. Smaller organizations may wish to do this through the use of outside courses and consultants, while larger organizations may wish to internalize instructional technology training and expertise.

2. Recognize the limitations of cross-training and that the primary value of the SME remains with the maintenance of content expertise.

3. Provide for adequate time and support (both resource and emotional) for new SMEs to settle into their roles.

4. Provide instructional technology consultants who understand the role of all parties to a development effort and who can effectively use consulting skills to foster effective working relationships and gain content understanding.

5. Encourage and provide vehicles for ITs to learn about content areas through front-end analysis, observation, and research.

6. Continuously evaluate the effectiveness of the working relationship between SMEs and ITs and assess their abilities and needs with respect to each other's area of expertise.

Almost every training organization which seeks to improve the working climate for its SMEs and ITs, and thus improve the resulting instructional product, will find much value in these recommendations. Yet it is also important to remember that no two training organizations are exactly alike. In every case, a program of cross-training of SMEs and ITs must be based upon the real needs of all training professionals.
TITLE:

TASK ANALYSIS: A SURVEY OF PROCEDURES AND PRODUCTS
TASK ANALYSIS: A SURVEY OF PROCEDURES AND PRODUCTS

Paul A. Twelker
Margo Hicks
Roger Kaufman

US Army Training Support Center

June, 1977
TASK ANALYSIS: A SURVEY OF PROCEDURES AND PRODUCTS

PROBLEM STATEMENT

Procedures for task analysis in TRADOC schools reflect inconsistencies. Products are judged to be of subadequate quality in many cases. The reasons for this are not altogether clear, and since all instructional development hinges on the validity of the task analysis, it is essential for TPD to study the methods of task analysis that TRADOC employs.

OBJECTIVES

The objectives of the study were:

1. To document the task analysis procedures used at a number of TRADOC schools.

2. To determine the match between these procedures and the ISD recommended procedures.

3. To determine important factors in TRADOC schools' task analysis procedures that represent:
   a. Significant conceptual advances.
   b. Problem areas that require attention.

4. To aid TPD in determining recommendations indicating how task analysis effectiveness may be maximized.

5. To develop a checklist instrument that may be used by task analysts to critique their task statements.

PROCEDURES

Three SSP members visited ten TRADOC locations and two contractors preparing TEC training materials (See Inclosure 1). Survey instruments were designed, tested, revised and administered to collect data on the procedures for and products of task analysis.

FINDINGS

Through use of an evaluation instrument, the team found:

1. Three out of four task analyses examined used adequate procedures in development of the preliminary task lists.

2. One out of two used adequate procedures in the review and validation of task lists.
TASK ANALYSIS (CONT'D)

3. One out of three provided documentation in the form of a flow chart depicting a sequence relationship of the steps of the task.

4. Two out of three were adequate with respect to the statement of the task. However, the validity of the task stated was not readily evaluated.

5. Two out of three gave complete lists of conditions.

6. One out of two provided a list of cues that initiate task performance.

7. One out of two provided an adequate list of standards.

8. No more than one out of two provided adequate lists of elements.

9. All references given were complete and up-to-date.

10. No task analysis included a list of knowledges/skills.

Through informal discussions and observation, the team found:

11. Motivation to do correct task analyses was high among those trained in CRI or exposed to ISD.

12. A high level of frustration due to imposition of unrealistic deadlines, in light of resource allocations, resulting in the skipping of critical steps in the procedure.

13. Procedures were for the most part understood, and in some instances, followed.

14. High regard for CRI and ISD was generally noted.

15. Many task analysts were enthusiastic about the contribution that they and their efforts will make to the Army.

PROBLEMS NOTED

1. Task lists are not related to missions, and in turn, missions are not related to Army/National needs.

2. Task lists are not validated against actual job performance in operational settings by observations, thus tasks listed are not actually performed and critical tasks are not listed.
3. Training is being inappropriately selected as a solution to a performance problem.

4. Target population characteristics are not adequately described.

5. There is confusion regarding the definition of a task, and its relation to and differences from a need, mission, or function.

6. There is no quality assurance vehicle to assess the procedures and products of task analysis in the schools.

7. Expert talent for guidance on task analysis is not easily tapped due to cumbersome contracting procedures, inadequate TDI staff and non-use of faculty development people.

8. New analysts lack skills in doing task analysis.

9. Supervisors lack skills in evaluating task analysis efforts and outcomes.

10. There is redundancy of the task analysis effort at stages of the instructional system development, between branches, and between branches and contractors.

11. Artificial limits are placed on the numbers of tasks within a job that may be listed on the analysis.

12. There is little guidance on the correct application of task analysis for jobs in supervision, management and administration.

13. Model task analysis formats have not been provided, nor is there any evidence of use of a clearinghouse of useful information for upgrading the quality of analyses.

14. The reporting of task analysis information is perceived as being constrained by the Soldiers' Manual regulation.

15. The publication of Soldiers' Manuals and SQTs are premature, forcing possible "concretizing" of inadequate information.

CONSEQUENCES OF PROBLEMS

People are not being trained to perform jobs/tasks critical to the missions required to fulfill Army/National needs. Likewise, people are being trained to perform job/tasks not required. Soldiers' skills are not combat ready, and training development costs are wasted.
TASK ANALYSIS (CONT'D)

3. A significant percentage (40%) of training development costs will be wasted, and the problem will not be solved if it is environmental, motivational, etc., rather than skill deficiency.

4. Critical skill deficiencies may be omitted and existing skills ignored causing inadequate practice for some skills and redundant practice in others.

5. Task detailing may be either too specific or too general.

6/7/9 There is a deterioration in the quality of task analysis, a waste of manpower to revise materials at a later point.

8. Analyses are inadequate and incorrect. An inordinate amount of time is taken to do them. The first few months at the new job become frustrating because productivity is low.

10. Duplication of effort is costly. A positive outcome is that the checks-and-balances system catches errors.

11. The size of steps is based on number of steps allowed rather than the actual performance and target population ability.

12. Task analyses in these "soft skill" areas are incomplete, incorrect, and/or frequently list the subordinates task steps rather than the task steps of the supervisor/manager.

13. Resources are wasted re-creating wheels.

14/15 Information required for design is not available or requires major revision.

RECOMMENDATIONS

RECOMMENDATION PROBLEM

LONG TERM # KEY

1. Conduct a needs assessment, external mode, and continue to update the data base at least once each year. 1

2. Perform mission analysis for all TRADOC areas. 1

3. Adopt a system approach process model, and distribute supplement to the ISD model with graphic illustration and definition of assessment/analysis levels. 5,11

4. Provide follow-up evaluation and technical assistance on a continuing basis to maintain the standards of analysis. 6/7

18-5
Develop the capability, and communication channels and vehicles, to provide counsel and share information among all TRADOC entities.

FOR IMMEDIATE PAY-OFFS

1. Commit the resources (money, people, time) to do the analysis according to the adopted model and standards.

   2. Procedure
      a. Follow the ISD model
      b. Delineate responsibilities for each function
      c. Clarify standards for analysis and design

   3. Product – TRADOC provide model documents for Task Analysis worksheets and final products.

   4. Personnel in analyst, designer and supervisor jobs:
      a. Select and hire qualified people for analysts jobs.
      b. Upgrade the skills of analysts in all levels of analysis, as well as design.
      c. Implement an evaluation procedure to maintain the standards for performance of analysts

   5. Make TRADOC policy consistent in the state-of-the-art in systematic analysis, design, development, implementation of a performance system.
### SCHOOLS, IN PRIORITY ORDER

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TITLE: RELATING NEEDS ASSESSMENT, PROGRAM DEVELOPMENT, IMPLEMENTATION, AND EVALUATION
RELATING NEEDS ASSESSMENT, PROGRAM DEVELOPMENT, IMPLEMENTATION, AND EVALUATION

Roger Kaufman
Robert G. Stakenas
Center for Needs Assessment and Planning
Learning Systems Institute
The Florida State-University
Tallahassee, Florida 32306

and

Jane C. Wager
Florida Credit Union League
Tallahassee, Florida 32304

June 1980

Occasional Paper No. 16
(Revised)

(accepted for publication in the Journal of Instructional Development—Winter, 1981)

A series of professional papers concerned with educational learning technology. Quotations from these papers are permitted with prior approval of the authors.
This is designed to help you understand the differences and relationships between needs assessment, program development, program implementation, and evaluation. Each section provides a purpose statement which will present the material to be understood. Each section has a number next to it to identify it for later questions and review. If you think you know the content already, go right to the questions at the end of this material. If you do not know it already, then proceed and when you are through check your understanding by answering the questions at the end.

The last ten years have witnessed an increasing interest in assessing needs in various organizational settings, enhanced in part by the "accountability movement" with its emphasis on responsibility for accomplishments. Consequently, several varieties of needs assessment have appeared, each with its own assumptions, tools and procedures (Witkin, 1977). Here we recommend and explain a basic type of needs assessment as a starting point for planning and accomplishment and present a model for implementing this and other types of needs assessments. Upon completion, you should be able to describe the processes of external and internal needs assessment and relate them to organizational efforts and organizational results (the Organizational Elements Model) and then further relate these to organizational impact upon society.

Need Defined.

1 Purpose: Define the concept of need and explain the pitfalls encountered when using more than one definition.

The term "need" is used here in a singular way and this specific definition will be used in the context of this paper: as a noun—a gap between "what is" and "what should be" in terms of results (Kaufman, 1972). Defining needs as a gap between desired results and observed results means that no solutions, how-to-do-its, or processes for closing the gap should be included in the need statement. Including any type of solution or process in a statement of need may reduce the options for meeting that need, and thus, foreclose the possibility of finding new or creative ways of closing the gap. Or, by using need as a verb (e.g., "We have a 'need' for more money") we risk implementing a solution which may not fit with the basic underlying gap in results.
External and Internal Needs Assessment.

2. Purpose: Define what is meant by external and internal needs assessment.

There are two possible overarching referents for needs assessment: one which looks at needs from a holistic point of view outside the organization—in society—doing the needs assessment; and one which looks at needs as seen within that organization. The first is called "external" needs assessment, and the second is termed "internal" needs assessment (Kaufman and English, 1979).

An external needs assessment attempts to identify the skills, knowledge, and attitudes which are important in order for someone to be at least self-sufficient, self-reliant, and not economically dependent once he/she is outside of the educational (or industrial) organization. The requirements for this "independence" should be used as the basis for planning (Kaufman and Carron, in press). In other words, an external needs assessment considers what individuals will have to do to be self-sufficient once they exit the educational or training system. Can they get and hold jobs? Survive socially and personally? Make contributions to their community and society? If there are gaps between what individuals can do in the current situations (the "what is") and when they should be able to do (the "what should be") with regard to the criteria of self-sufficiency and contribution, then action should be taken to close these gaps. Once these "external" criteria are set, the "internal" varieties of needs assessment become useful because fewer assumptions are required regarding the organization's effect or impact on society. The social usefulness of organizational efforts can thus be increased and maintained.

An internal needs assessment attempts to identify organizational goals, objectives, and means for accomplishing the societal results previously determined through an external needs assessment, and not by getting "blue sky" internal objectives. Most efforts in needs assessment are of the internal variety only, i.e., restricting the investigation to gaps in accomplishing current goals and objectives of the particular organization. Internal needs assessment are best augmented with external needs assessment data (Kaufman and English, 1979).
Organizational Elements Model.

Purpose: Define the five basic parts of the Organizational Elements Model and relate each one to the others.

Having defined external needs assessment, how do we go about implementing one? In conducting an external needs assessment, it is necessary to relate both to people within the organization under study as well as to the reality of what people have to know and do outside of that organization--currently and in the future. These relationships can be clarified according to an Organizational Elements Model (Kaufman, 1979 and Kaufman and English, 1979) which will serve as the major tool for putting external and internal needs assessment into action.

Basic Concepts.

The organizational elements are:

INPUTS: The existing raw materials, ingredients, and starting conditions that an organization has on-hand with which to achieve its mission:

- Needs
- Goals
- Personnel
- Learners
- Money
- Equipment
- Laws
- Policies
- Facilities
- Plans

PROCESSES: The methods and means, the ways, the how-to-do-its, by which ingredients and materials are staged, managed, modified, and put into action to create useful results such as:

- Instructional Programs
- Management by objectives
- Staff development
- Participative management
- Supervision
- Production lines
- Curriculum
- Computer-assisted learning
- Systems approach
- System approach

PRODUCTS: The en-route results (or things) which an organization produces:

- Mastery of an objective by learners
- Validated training materials or procedures
- Windshields for cars
- A "chip" for a main frame computer

OUTPUTS: That which an organization delivers to society:

- Automobiles ready for delivery
- Personnel with productive skills who work for the organization and live in the community
- Graduates of an educational institution

OUTCOMES: The effects or impact of organizational results (outputs) in society:

- Positive balance of payments
- Persons who are economically self-sufficient
- Ecological balance
In order to assure that organizational efforts (inputs and processes) yield useful organizational results (products and outputs), they should be based upon current and future societal requirements. The interrelationship among these five organizational elements is shown in Figure 1. Implied in this figure is the fact that, seen from a holistic perspective, organizations (be they military, business, or school) are "internal" agents whose purpose is to contribute to useful societal goals and objectives.

Figure 1 shows each of five organizational elements. Organizational efforts include input and processes. Products and outputs are organizational results. And the effects of both of these sets are seen on society and "externally"; those societal results are termed outcomes. Four of the elements are "internal": they relate to organizational efforts and results. The one which is "external" relates to the effects of an organization in the host society or community.

Figure 2 shows a representation of the Organizational Elements Model with two other dimensions: "what is" and "what should be". This figure suggests that a process (note the solid arrows) which incorporates both internal and external needs assessment would include first describing, progressively, "what is" for inputs then move to processes, then to products, then outputs, and finally to outcomes. The purpose in following this sequence is to determine linkages and the required level of congruence between the elements.

After this "what is" assessment, the same procedure can be performed for "what should be" by starting with outcomes, then moving back through outputs, products, processes, and then finishing with inputs. Thus, the gaps between "what is" and "what should be" for each of the elements (or combination of elements) can be identified through discrepancy analysis (open arrows, fig. 3).

An important but subtle point should be emphasized regarding the "fit" between internal and external environments and between outputs and outcomes. It is not enough to simply count the number of "output" units produced by an organization. If the organization is to enjoy continuing success, its outputs must be valued and useful in the external environment. Thus, if automobiles are the output, they must be sold in order for the corporation to achieve its mission. In like manner, graduates of educational organizations must be able to perform effectively in economic and citizen roles in society if the legitimacy of educational institutions is to be validated and maintained. The criterion for and judgments of success ultimately come from the external not the internal environment.
Figure 1. The Organizational Elements Model including some educational examples of each and the relationship between the elements and the Internal and External frames of reference.

(After Kaufman, 1979)
Figure 2. Designing Needs Assessments and Evaluations Based on the Organizational Elements Model

Kaufman, Stakenes and Wager
Partnership Planning.

**Purpose:** Explain the importance of partnership planning in a useful needs assessment.

Partnership planning is an integral component of any useful needs assessment. In order to accurately determine "what is" and "what should be" for a particular set of symptoms or conditions, representatives of groups affected by the problem and its solution should be involved formally in the needs assessment effort. By involving those people who will be or could be effected by the outputs of the system, there will be a higher probability of acceptance of the results and a higher probability that all important aspects of the problem(s) will be identified. Partner group representatives, i.e., learners, educators, and community members, have the responsibility of determining gaps between current results and desired (or required) results according to their values. The partner groups then compare their "perceived needs" in order to find and agree upon a common set. These perceived needs should be justified and documented by external empirical data concerning requirements for self-sufficiency in order to include both "felt needs" as well as documentable and empirically justified needs.

Frequently disagreements arise over means (processes) or how-to-do-its, rather than gaps in results. There are times when people argue about means and believe that they are dealing with ends. Agreement and consensus is usually increased by shifting all discussions from means to ends, ideally to gaps in outcomes.

Change and Maintenance Requirements.

**Purpose:** (a) Define what is meant by change requirements and maintenance requirements.

**Purpose:** (b) Explain why all gaps in the organizational elements are not necessarily "needs".

Given the data base compiled from the partner groups, the needs assessment process determines the actual gaps between "what is" and "what should be" for each of the organizational elements, shown as open arrows in Figure 3. Also included in this analysis is a listing (shown at the bottom two rows of Figure 3) of that which should be changed—change requirements—as well as a determination of that which should be continued and maintained—continuation or maintenance
requirements. Listing that which is to be changed as well as that which must be continued highlights the fact that needs assessment and planning not only deal with change but also with preserving that which is in-process and useful. Also, a discrepancy is not necessarily a deficiency (Scriven and Roth, 1978).

As a reminder, earlier it was stated that in the context of the Organizational Elements Model, "need" is defined as a gap between "what is" and "what should be" in terms of results. "Results" were shown in Figure 1 to include products, outputs, and outcomes. Although input and process gaps may also be identified, these gaps should not be called needs. They are simply gaps in means to achieve a particular end result. Gaps in process and/or inputs might be called quasi-needs. However, care should be exercised not to equate gaps in processes or inputs with gaps in results.

Methods and Means.

<table>
<thead>
<tr>
<th>Purpose: Define the purpose of methods and means in a needs assessment.</th>
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When the listing of change and maintenance requirements is completed, the needs (gaps) are placed in priority order, then the balance of planning may be continued with the derived data. At the bottom of Figure 4, planners or designers should list the possible methods-means or interventions (programs, projects, curriculum, techniques, etc.) which might serve to close the gaps or maintain those results which have been selected for continuation. Then, the interventions which meet feasibility and effectiveness criteria are selected (row marked "Selected Interventions"), and implementation is ready to begin. Up to this point, this process has yielded the requirements for maintenance and change for each of the organizational elements, and further, has identified possible methods and means (strategies, tools and procedures) for reaching the required products and outputs.

A needs assessment which only looks at gaps in processes (methods-means) is more of a "wish list" than a needs assessment. For example, assessments which product statements such as, "We need to provide more inservice training for the supervisors" or "We need more audiovisual equipment for our staff training program" would fall into a "wish list" category because they assume that important gaps in results exist—an assumption which a needs assessment should verify or reject with valid, objective data. Unfortunately, many current needs assessment models ask only for choices among various interventions (team teaching or differentiated staffing; organizational development or system approach; individualized instruction or computer-assisted learning, etc.). One
Figure 4. Linking Problem Solving and Planning to Needs Assessment Information
should only make functional decisions among possible alternative ways and means for doing a job based upon the results, both internal and external, which have to be achieved. Asking people about what resources or tools they want without reference to required results is a poor method for useful planning and development.

Evaluation and Needs Assessment.

**Purpose:** Explain the importance of evaluation in needs assessment, and show how needs assessment and evaluation relate.

After implementing the selected interventions, formative evaluation should take place. Figure 5 shows evaluation activities as broken arrows. Evaluation starts by going through the "what is" elements and relating each to the "what should be" requirements to determine the extent to which the gaps have actually been closed and continuation requirements met. This evaluation phase determines the extent to which one has performed that which has been planned--process evaluation. Summative evaluation takes place when one compares expected results with actual results--when one examines products, and more appropriately, outputs and outcomes. Evaluation looks at gaps between what was intended and what was actually accomplished, while needs assessment examines the gaps between what should be accomplished and that which was actually accomplished.

Finally one should use this evaluation base for continuing the needs assessment by a shift to the new "what is" for each of the elements. Then, in the same manner, as shown in Figures 1 and 2, repeat the process based upon the changes wrought through previous efforts. Needs assessment, thus is a continuing process and may be linked with planning, development and evaluation.

The Steps for Conducting a Needs Assessment.

**Purpose:** Provide an external and internal needs assessment checklist.

The steps involved in conducting an external needs assessment are summarized in the checklist below.

1. Obtain commitment of the initial planning group to use an external referent for planning, not just the existing goals and objectives of the agency, department, or section.
Figure 5. Evaluation—Shown as broken lines—is the determination of, "Have we accomplished that which we set out to accomplish?"  

*Kaufman, Shakenas and Wager*
2. Identify the various partnership groups and their constituency including representatives (learners, educators, and society/community for education).

3. Obtain current input, process, product, output and outcome data of the organization.

4. Obtain data on future outcome requirements and subsequent output, product, process, and input requirements of the organization.

5. Working with the partners, determine the gaps in the organizational elements and place gaps to be resolved in priority order based perhaps on the "cost" to close the gap and the "cost" to ignore the gap.

**Implementation and Evaluation Checklist**

<table>
<thead>
<tr>
<th>Purpose: To list the steps in an implementation and evaluation checklist.</th>
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1. List change and maintenance requirements.

2. List and select possible interventions (methods and means) which might serve to close identified needs (gaps).

3. Determine the extent to which you have accomplished what you set out to accomplish.

4. Be prepared to consider new needs which might arise during the course of planning.

5. Repeat, at least periodically, the needs assessment procedure.
TEST YOURSELF -- PART I

Test yourself on the main concepts that have been covered.
(The number of each question is the same as the section where the concepts are presented.)
The correct answers to these nine questions are presented after "Test Yourself - Part II".

1. Define the concept of need and explain the pitfalls encountered when using more than one definition.

2. Define what is meant by external and internal needs assessment.

3. Define the five basic parts of the Organizational Elements Model and relate each one to the others.

4. Explain the importance of partnership planning in needs assessment.

5. (a) Define what is meant by change requirements and maintenance requirements.
    (b) Explain why all gaps in the organizational elements are not necessarily "needs".

6. Define the purpose of methods and means in a needs assessment.

7. Explain the importance of evaluation in needs assessment.

8. What are the steps in conducting a needs assessment?

9. What are the steps required to implement and evaluate after completing a needs assessment?
TEST YOURSELF -- PART II

The concepts of needs assessment are useful in education, history, and the military--anywhere interventions are designed and used to improve results. The challenge is to select the appropriate method to correctly analyze and diagnose organizational problems. A classification table has been prepared to assist you in making such decisions. Review the type of problem and the recommended actions shown in this table. Then proceed to analyze the hypothetical scenario which appears below.

Classification Table: Types of Problems and Recommended Actions

<table>
<thead>
<tr>
<th>TYPE OF PROBLEM</th>
<th>RECOMMENDED ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Adequacy of raw materials, personnel, ingredients, facilities</td>
<td>Determine input gaps</td>
</tr>
<tr>
<td>B. Effectiveness and efficiency of organizational processes</td>
<td>Determine process gaps</td>
</tr>
<tr>
<td>C. Usefulness of products/subcomponents produced</td>
<td>Determine product gaps</td>
</tr>
<tr>
<td>D. Usefulness of organizational &quot;deliverables&quot; to society</td>
<td>Conduct internal needs assessment</td>
</tr>
<tr>
<td>E. Organizational or individual self-sufficiency and impact on society</td>
<td>Conduct external needs assessment</td>
</tr>
</tbody>
</table>

THE SCENARIO

The Great Atlantic Fuel Company has been having problems with fuel shipments which have been found to be contaminated. In analyzing the problem the company found that loaders often leave tank valves open and unattended after filling shipping tanks. The contamination problem was first noted when a jet airplane crashed into a tenement area, narrowly missing a housing development but destroying a local job placement center. Fortunately no one was killed on the ground; but low income people in the neighborhood were slower in finding jobs after the crash and resulting devastation.

Examples from this scenario have been selected and listed in a problem chart which is on page 17. Using information given in the Classification Table, state the actions that should be taken to assess needs in relation to the specific problem data. For example: To determine the impact of the property destroyed by the plane crash, would you implement an external needs assessment, an internal needs assessment, or one of the other types of needs assessment?
### PROBLEM TABLE

<table>
<thead>
<tr>
<th>Data regarding the problem</th>
<th>Recommended action (type of Gap Analysis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Impact of property destroyed by plane crash on inhabitants</td>
<td>1.</td>
</tr>
<tr>
<td>2. Contaminated fuel shipments</td>
<td>2.</td>
</tr>
<tr>
<td>3. Workers responsible for loading tankers</td>
<td>3.</td>
</tr>
<tr>
<td>5. Decreased rate of job placement</td>
<td>5.</td>
</tr>
</tbody>
</table>

### Answers--Part I

1. The definition of need as a gap between "what is" and "what should be" in terms of results is a more useful definition than those that mention solutions or processes in their need statements. Using need as a verb may foreclose the possibility of finding new or creative ways of closing the gap, or from dealing with the actual, more basic problem.

2. An external needs assessment attempts to identify the skills, knowledge, and attitudes which are necessary for individual self-sufficiency in society currently and in the future. Once self-sufficiency criteria are set, an organization can use an internal needs assessment method to identify goals and objectives for accomplishing required societal results.

3. **Inputs** - raw materials, ingredients, and starting conditions that an organization has with which to achieve its mission.  
   **Processes** - methods and means by which ingredients and materials are managed, modified, and put into action to create useful results.  
   **Products** - en-route results which an organization produces.  
   **Outputs** - that which an organization delivers to society  
   **Outcomes** - impact of outputs in society.

Inputs and processes are the organization efforts which lead to organizational results in the form of products and outputs. All four of these "internal" elements impact on society by producing results that are termed outcomes.

4. By involving those people who will be or could be affected by the outputs of the system, there will be a higher probability of acceptance of the results and a higher probability that all important aspects of the problem(s) will be identified.

5. (a) Change and maintenance requirements are listed of those things to be changed or continued within each organizational element to ensure that gaps between the "what is" and "what should be" will be closed.

(b) Need is defined as a gap between "what is" and "what should be" in terms of results. Results include products, outputs, and outcomes. Gaps in inputs and processes therefore, should not be called needs.
b. Methods-means are those interventions which might serve to close identified gaps or maintain those results which have been selected for continuation.

7. Evaluation is the determination of "have we accomplished that which we set out to accomplish?" Needs Assessment in it's most basic form determines gaps between "what we accomplished" and compared to what we should accomplish. We compare "what is" (observed results) with "what should be" (standards) and then make judgments based on the importance and size of discrepancy noted. These judgments provide a basis for selecting gaps to be removed.


ANSWERS--PART II

1. Impact of property destroyed by plane crash on inhabitants--conduct external needs assessment to determine the impact of delivering contaminated fuel on society.

2. Contaminated fuel shipments--conduct internal needs assessment, to determine if organizational results are aligned with societal results.

3. Workers responsible for loading tankers--identify input and process gaps to determine possible problems in quality or quantity of workers and loading techniques at the Great Atlantic Fuel Company.

4. Filling fuel containers--identify process gaps to determine possible problem in method used to fill fuel containers.

5. Decreased rate of job placement--conduct external needs assessment to determine the impact of plane crash, and what caused it, on the self-sufficiency of people in the areas surrounding the plane crash site.
References


Additional Readings


Houston, R. W. and associates. Assessing school/college/community needs. The Center for Urban Education, The University of Nebraska at Omaha; 3805 North Sixteenth Street, Omaha, Nebraska, 68110, 1978.


