

Objective

Development Issues for Evaluating Competency

Rationale Since there are different ways to resolve the training issue, we needed something that was simple to administer and yet ample in its delivery. It had to be as comprehensive as possible, given the time in which the development of the plan could be completed. The evaluation of the data and the recommendations could then be compiled. In order to develop a reasonably objective plan, the methodologies had to be acceptable to the agencies involved (*Fire, Police & EMS, FEMA, OSHA & PESH (PESH is included at this point because, the possibility of the New York Task Force 1 (NY TF-1) operating in the state was likely; if this happened we would fall under their jurisdiction)*). The evaluation process for identifying deficiencies could not be punitive but needed to identify the weaknesses in the present training system. We needed to get a letter from PESH approving the methodologies that would be developed and used for the present and future evaluations.

Letter to PESH On 1/8/1995 a letter was sent to PESH requesting PESH to evaluate the methodologies that we were planning to use. The Fire Department had done this for another project it was working on, and the same letter was just a relevant in this case. A copy of this letter will be retained in the New York Task Force 1 (NY TF-1) files if these methodologies become acceptable. This letter was received by PESH on 1/23/95, who forwarded to Albany to review, evaluate and reply. On 2/7/95 a reply was received which supported the methodologies that were outlined. This accomplished some very important objectives:

- The Health & Safety of the New York Task Force 1 (NY TF-1) members could be improved by better training methodologies.
- The New York Task Force 1 (NY TF-1), if it choose to do so, now had a document it could use to develop an assessment that would avoid future OSHA & PESH fines & violations for non compliance with training issues.
- The New York Task Force 1 (NY TF-1) now had a means to identify and correct deficiencies that were found during the evaluation process. This was not the case in previous training done by the Department.
- This process would now give accountability to both the instructors and the members by providing documentation of, and correction of deficiencies thereby avoiding frivolous legal civil actions in the event of wrongful death, injuries by errors & omissions.

Knowledge Methodology In order to determine what each member of New York Task Force 1 (NY TF-1) knowledge level is, a written evaluation would be developed and given to all members of New York Task Force 1 (NY TF-1) based on their specialty. The evaluation process would include several types of questions. We examined several types of questions and determined the advantages and disadvantages of each type. We then weighed the merits as well as the types of questions that would be the most expedient with a high level of reliability. The options available were as follows

- Multiple-Choice are questions that consist of two parts. The stem which is the question or problem and alternatives with one of the alternatives being the most correct.

Advantages

- #1 versatility in measuring all levels of cognitive ability
- #2 highly reliable test scores
- #3 scoring efficiency & accuracy
- #4 objective measurement of the New York Task Force 1 (NY TF-1) members achievement or ability
- #5 a wide sampling of content or objectives
- #6 reduced guessing factor when compared to true/false items
- #7 different response alternatives to provide diagnostic feedback

Disadvantages

- #1 difficult and time consuming to construct
- #2 lead evaluators to favor simple recall of facts
- #3 place a high degree of dependence on New York Task Force 1 (NY TF-1) members reading ability and evaluators writing ability

- True/False questions are written in three basic forms:
 1. Simple (e.g.. The knowledge of the Federal Regulations is required for Hazardous Materials response True False)
 2. Complex (e.g.. The knowledge of the Federal Regulations is required for Hazardous Materials response True False Opinion)
 3. Compound (e.g.. The knowledge of the Federal Regulations is required for Hazardous Materials response True
False If the statement is false, what makes it false?)

Advantages

- #1 widest sampling of content or objectives per unit of testing time
- #2 scoring efficiency and accuracy
- #3 versatility in measuring all levels of cognitive ability
- #4 highly reliable test scores
- #5 an objective measurement of New York Task Force 1 (NY TF-1) member achievement or ability

Disadvantages

- #1 incorporate an extremely high guessing factor
- #2 can often lead an evaluator to write ambiguous statements due to the difficulty of writing statements which are unequivocally true or false
- #3 does not discriminate between New York Task Force 1 (NY TF-1) members of varying ability
- #4 they often include more irrelevant clues than do other types of questions
- #5 can often lead an instructor to favor testing of trivial knowledge

- Matching item consist of a column of stimuli presented on the left side of the page with a column of responses on the right. New York Task Force 1 (NY TF-1) members are required to match responses with an associated given stimuli.

Advantages

- #1 provide short periods of reading and response time
- #2 highly reliable test scores
- #3 scoring efficiency & accuracy
- #4 objective measurement of the New York Task Force 1 (NY TF-1) members achievement or ability

Disadvantages

- #1 difficulty measuring learning objectives requiring more than a simple recall of information
 - #2 difficult to construct due to the problem of selecting a common set of stimuli and responses
- Completion questions require the New York Task Force 1 (NY TF-1) member to answer a question or complete a statement by filling in a blank with the correct response.

Advantages

- #1 can provide a wide sampling of content
- #2 can efficiently measure lower levels of cognitive ability
- #3 can minimize guessing as compared to multiple choice or True/False items
- #4 can usually provide an objective measure of New York Task Force 1 (NY TF-1) member achievement or ability.

Disadvantages

- #1 difficult to construct so that the desired response is clearly indicated
- #2 difficulty measuring learning objectives requiring more than a simple recall of information
- #3 often includes more irrelevant clues than other types of test questions
- #4 more time consuming to score when compared to multiple choice or True/False test questions
- #5 more difficult to score since more than one answer may have to be considered correct if the question was not properly prepared

- Essay questions consist of a small number of questions where the New York Task Force 1 (NY TF-1) member is expected to demonstrate the ability to recall factual knowledge, organize this factual knowledge and present it in an logical integrated answer.

Advantages

- #1 are easier and less time consuming to construct than are most other type of test questions
- #2 provide a means for testing the New York Task Force 1 (NY TF-1) member's ability to compose an answer and present it in a logical manner
- #3 can efficiently measure higher order cognitive objectives (e.g., analysis, synthesis, evaluation)

Disadvantages

- #1 cannot measure a large amount of content or objectives
- #2 generally provide low test and test evaluator reliability
- #3 require an extensive amount of evaluators time to read and grade
- #4 generally do not provide an objective measure of the New York Task Force 1 (NY TF-1) members achievement or ability (subject to bias on the part of the evaluator)

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It was determined early in the development process that objective test questions (Multiple-choice, True/False, Matching) were preferable to subjective test question assessment. These options were more easily available and would require less time to assemble than the Completion and Essay type test questions. Some of the objective test questions would be drawn from different programs that were part of the current schools presently attended by New York Task Force 1 (NY TF-1) personnel. FEMA had given no direction as to what the members of New York Task Force 1 (NY TF-1) were expected to know. This left a wide latitude of subject areas to be covered. There were many work tasks that New York Task Force 1 (NY TF-1) members would be asked to perform of which only a small portion were addressed through training. The basis for the objective would be the Books Volumes And Modules developed jointly by the three agencies.

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- Book 1 Management
 - Volume 1 FEMA Management & Coordination Training
 - Volume 2 Advanced ICS
 - Volume 3 FEMA Orientation Training
 - Volume 4 Intermediate ICS
 - Volume 5 Basic ICS
- Book 2 Search
 - Volume 1 MSF/MSO
 - Volume 2 FEMA Canine Specialist Training
 - Volume 3 FEMA Technical Search Specialist Training
 - Volume 4 FEMA Canine Test
- Book 3 Rescue
 - Volume 1 FEMA Rescue Specialist Training
- Book 4 Medical
 - Volume 1 CPR/First Aid
 - Volume 2 Critical Incident Stress Debriefing
 - Volume 3 EMT Training
 - Volume 4 FEMA Medical Team Training
- Book 5 Technical
 - Volume 1 Haz-Mat First Responder Operational Level
 - Volume 2 FEMA Structures Specialist Training
 - Volume 3 Rescue Systems I
 - Volume 4 NFPA 472 Hazardous Material Technician
 - Volume 5 FEMA HR&E Specialist Training
 - Volume 6 FEMA Technical Information Specialist Training
- Book 6 Communications
 - Volume 1 FEMA Communications Specialist Training
- Book 7 Logistics
 - Volume 1 Logistics Specialist Training
 - Volume 2 Loadmaster Training
 - Volume 3 Packaging/Palletizing
 - Volume 4 Labeling/Marking Packages & Containers
- Book 8 Safety
- Book 9 Planning
 - Volume 1 Callout & Notification Procedures
 - Volume 2 Mobilization to Point of Departure Procedures
 - Volume 3 Aircraft Loading & Flyaway Procedures
 - Volume 4 Full Field Operations Exercises

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This part of the evaluation process would be administered by instructors of New York Task Force 1 (NY TF-1) proctoring the evaluations. The directions that each evaluator would give to the members would be to answer only the questions they knew (this is a non graded evaluation). We were interested in determining what training was necessary, not their best guesses. If the New York Task Force 1 (NY TF-1) member's were unsure or didn't know they were instructed to leave the answer blank. The rationale was obvious (we would not expect New York Task Force 1 (NY TF-1) members to be guessing in the field what to do at actual operations, or guessing when providing information to the Task Force Leader, we would expect them to know). In addition Task Force Leaders should only base their decisions on reliable information and not on guesses of well intentioned individuals).

Skills Methodology

The skills portion was much more complex to manage and more difficult to objectively evaluate. This would require that we develop performance evaluations that specifically addressed the skills New York Task Force 1 (NY TF-1) members are expected to perform in the field. There are many skills required for the field. We discussed and agreed we could not possibly cover all the skills necessary so we decided to identify some performance evaluations that we would use during the testing process. If this methodology was acceptable to the members of New York Task Force 1 (NY TF-1) we would continue to develop other performance evaluations after this plan was accepted. Each performance evaluation was different and required different skills, consequently the number of questions varied. Sample questions for this portion of the evaluation process would be placed in the Appendix of this plan

All New York Task Force 1 (NY TF-1) personnel would be given performance evaluations on

- FEMA Orientation Training
- Basic ICS
- Haz-Mat First Responder Operational Level
- CPR/First Aid
- Critical Incident Stress Debriefing

New York Task Force 1 (NY TF-1) members would be given other evaluations on their specialty areas. This would be done randomly avoid any bias on the part of the evaluators having personnel who they know would perform poorly, assigned on a given work task. Each performance evaluation would be performed by at least two New York Task Force 1 (NY TF-1) members.

- Problem Solving Test Items this type of evaluation presents the New York Task Force 1 (NY TF-1) members with a problem or work task that needs to be completed and requires a demonstration of New York Task Force 1 (NY TF-1) SOP's or tool and/or equipment operating procedures with correct solutions.

Advantages

- #1 this minimizes guessing by requiring the students to provide original response rather than to select from several alternatives.
- #2 are easier to construct than multiple choice or matching items.
- #3 can most appropriately measure learning objectives which focus on the ability to apply skills or knowledge in the solution of problems
- #4 can measure an extensive amount of content or objectives

Disadvantages

- #1 generally provide low test score and test scorer reliability
 - #2 require an extensive amount of evaluators time to read and grade
 - #3 generally do not provide an objective measurer of member achievement or ability (subject to bias on the part of the evaluator when partial credit is given)
- Performance Test Items are designed to assess the ability to perform correctly in a simulated situation in which the New York Task Force 1 (NY TF-1) member will ultimately be expected to apply the members learning

Advantages

- #1 can most appropriately measure learning objectives which focus on the ability of the members to apply skill or knowledge
- #2 provide a means for testing the member's ability to compose an answer and present it in a logical manner
- #3 can efficiently measurer higher order cognitive objectives (e.g. analysis, synthesis, evaluation)

Disadvantages

- #1 cannot measure a large amount of content or objectives
- #2 generally provide low test and test evaluator reliability
- #3 require an extensive amount of evaluators time to read and grade
- #4 generally do not provide an objective measure of the members achievement or ability (subject to bias on the part of the evaluator)

Once all evaluations were completed, the questions would be evaluated to determine if the level of difficulty was appropriate and acceptable. This would be done by reviewing the questions (test question analysis) and the responses of the New York Task Force 1 (NY TF-1) members. Results would be compiled and be presented to Task Force Leaders for review.

References

National Fire Academy (Hazardous Materials Programs)

- Chemistry of Hazardous Materials
- Hazardous Materials Operating Site Practices
- Hazardous Materials Scene Management

California Specialized Training Institute

- Hazardous Materials Technician/Specialist Program
Modules "A"- "G"

University of Illinois (Office of Instructional Resources)

- The Assessment & Improvement of Instruction - Improving your
Test Questions

United States Code of Federal Regulations

29 CFR part 156	Fire Brigade Standards
40 CFR part 311	
29 CFR 1910.120	Hazardous Waste & Emergency Response Operations
29 CFR 1200	Hazard Communication Standard
29 CFR 1919.146	Confined Space
29 CFR 1910.1030	Bloodborne Pathogen & Infection Control
29 CFR 1910.134	Respiratory Protection
29 CFR 1001	Asbestos
49 CFR 100-199	Transportation of Hazardous Materials
10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910.20	Access to Employee Exposure & Medical Records
29 CFR 1910.133	Eye & Face Protection
29 CFR 1910.135	Occupational Head Protection
29 CFR 1910.136	Occupational Foot Protection
29 CFR 1910.151	Medical Services and First Aid
29 CFR 1010.1000	Toxic & Hazardous Substances
29 CFR 1926.651	Specific Excavation Requirements
29 CFR 1926.652	Trenching Requirements