# DOWNLOAD PDF RESEARCH TECHNIQUES IN HUMAN ENGINEERING.

## Chapter 1 : Research Techniques in Human Engineering : Jon Weimer :

*A primer on the research issues and techniques for each human factors subdiscipline, this book brings together the works of some of the best human factors researchers, from Wickens to Willeges and from Boehm-Davis to Mital.*

See Article History Alternative Titles: The term human-factors engineering is used to designate equally a body of knowledge, a process, and a profession. As a body of knowledge, human-factors engineering is a collection of data and principles about human characteristics, capabilities, and limitations in relation to machines, jobs, and environments. As a process, it refers to the design of machines , machine systems, work methods, and environments to take into account the safety, comfort, and productiveness of human users and operators. As a profession, human-factors engineering includes a range of scientists and engineers from several disciplines that are concerned with individuals and small groups at work. The terms human-factors engineering and human engineering are used interchangeably on the North American continent. Some small specialized groups prefer such labels as bioastronautics, biodynamics, bioengineering , and manned-systems technology; these represent special emphases whose differences are much smaller than the similarities in their aims and goals. The data and principles of human-factors engineering are concerned with human performance, behaviour, and training in human-machine systems; the design and development of human-machine systems; and systems-related biological or medical research. Because of its broad scope, human-factors engineering draws upon parts of such social or physiological sciences as anatomy , anthropometry , applied physiology , environmental medicine , psychology , sociology , and toxicology , as well as parts of engineering, industrial design , and operations research. The human-factors approach to design Two general premises characterize the approach of the human-factors engineer in practical design work. The first is that the engineer must solve the problems of integrating humans into machine systems by rigorous scientific methods and not rely on logic, intuition , or common sense. In the past the typical engineer tended either to ignore the complex and unpredictable nature of human behaviour or to deal with it summarily with educated guesses. Human-factors engineers have tried to show that with appropriate techniques it is possible to identify human-machine mismatches and that it is usually possible to find workable solutions to these mismatches through the use of methods developed in the behavioral sciences. The second important premise of the human-factors approach is that, typically, design decisions cannot be made without a great deal of trial and error. There are only a few thousand human-factors engineers out of the thousands of thousands of engineers in the world who are designing novel machines, machine systems, and environments much faster than behavioral scientists can accumulate data on how humans will respond to them. More problems, therefore, are created than there are ready answers for them, and the human-factors specialist is almost invariably forced to resort to trying things out with various degrees of rigour to find solutions. Thus, while human-factors engineering aims at substituting scientific method for guesswork, its specific techniques are usually empirical rather than theoretical. The human-machine model Human-factors engineers regard humans as an element in systems, and a human-machine model is the usual way of representing that relationship. The simplest model of a human-machine unit consists of an individual operator working with a single machine. In any machine system the human operator first has to sense what is referred to as a machine display, a signal that tells the individual something about the condition or the functioning of the machine. A display may be the position of a pointer on a dial, a light flashing on a control panel, the readout of a digital computer , the sound of a warning buzzer, or a spoken command issuing from a loudspeaker. Having sensed the display, the operator interprets it, perhaps performs some computation, and reaches a decision. In so doing, the worker may use a number of human abilities, including the ability to remember and to compare current perceptions with past experiences, to coordinate those perceptions with strategies formed in the past, and to extrapolate from perceptions and past experiences to solve novel problems. Psychologists commonly refer to these activities as higher mental functions; human-factors engineers generally refer to them as information processing. Having reached a decision, the human operator normally takes some action. This action is usually exercised on some kind of a controlâ€"a push button, lever, crank, pedal, switch, or handle. The action upon one or more of these controls exerts an influence on the machine and on its output, which in turn changes the display, so that the cycle is continuously repeated. A human-machine system does not exist in isolation; it exists in an environment of some sort. A human-machine example Driving an automobile is a familiar example of a simple human-machine system. In driving, the operator receives inputs from outside the vehicle sounds and visual cues from traffic, obstructions, and signals and from displays inside the vehicle such as the speedometer, fuel indicator, and temperature gauge. Finally, the driver is influenced by such environmental factors as noise, fumes, and temperature. The simple human-machine model provides a convenient way for organizing some of the major concerns of human engineering: Human factors in large systems No matter how important it may be to match an individual operator to a machine, some of the most challenging and complex human problems arise in the design of large human-machine systems and in the integration of human operators into these systems. Examples of such large systems are a modern jet airliner, an automated post office, an industrial plant, a nuclear submarine , and a space vehicle launch and recovery system. In the design of such systems, human-factors engineers study, in addition to all the considerations previously mentioned, three factors: Systems are generally designed for particular kinds of operators. A space vehicle, for example, is designed for a highly select handful of astronauts. Automobiles, on the other hand, are designed to accommodate a wide spectrum of people. In large systems, the specification of personnel requirements is an integral part of systems design. Personnel are trained; that is, they are given appropriate information and skills required to operate and maintain the system. System design includes the development of training techniques and programs and often extends to the design of training devices and training aids. Instructions, operating procedures, and rules set forth the duties of each operator in a system and specify how the system is to function. Tailoring operating rules to the requirements of the system and the people in it contributes greatly to safe, orderly, and efficient operations. Applications of human-factors engineering The basis of human-factors engineeringâ€”the consideration of information about human users in the design of tools, machines, jobs, and work environmentsâ€”has always been present. One of the oldest and most efficient of human implements , the scythe , shows a remarkable degree of human-factors engineering, undoubtedly reflecting modifications made over many centuries: All of this is in sharp contrast with the conventional snow shovel, a modern implement of generally poor design that has been blamed for many a wintertime back strain. The need for a more formal approach to these human problems was created when machines became vastly more complex than they had ever been. High-speed jet aircraft, computers, radar , nuclear submarines, communications satellites , space vehiclesâ€”all these are products of the modern era. The fantastic growth in the number and complexity of machines has created entirely new problems about the use of human operators and the way they can be integrated into systems. Moreover, the solution to these new problems cannot be found in the collective wisdom of society. For example, not long ago no one had any way of predicting with any certainty how astronauts could or would function in a weightless environment. Human-factors engineering is, therefore, a child of the times, born of a mechanized civilization. Applications of human-factors engineering have been made to such simple devices as highway signs, telephone sets, hand tools, stoves, and to a host of modern, sophisticated complexes such as data processing systems, automated factories and warehouses, robots, and space vehicles. The experience gained in devising these systems has contributed to the realization that even relatively simple devices raise unexpectedly important questions on human useâ€”questions that conventional engineering practice frequently cannot answer. Push-button telephone The modern push-button telephone handset provides a good example of a relatively simple device that has required a great deal of human-factors engineering. The layout of the keys in the four rows of three buttons, for example, was selected only after extensive tests on a variety of arrangements: The top-to-bottom design decision was not simply a matter of logic; tests showed that people actually made fewer errors and took less time with that arrangement than they did with the calculator arrangement. Similar factors were considered in designing the shape of the handset itself. The locations, separations, and angles between the earpiece and mouthpiece were determined so that the assembly would fit comfortably around the greatest number of different human faces; and the weight of the handset was designed to be neither too light nor too heavy. Space suit The designing of a much more complicated device, such as a space suit, presents more intricate problems. The consequent pressure differential between the inside and the outside of the suit is so great that when inflated the suit becomes a distended, rigid, and unyielding capsule. Special joints were designed to give the astronaut as much free movement as possible. The best engineering has not been able to provide as much flexibility of movement as is desirable; to compensate for that lack, attention has been directed toward the human-factors design of the tools and devices that an astronaut must use. This is such an imposing list of human requirements that an entire technology has been developed to deal with them and, indeed, with the provision of simulated environments and procedures for testing and evaluating space suits. Typewriter keyboard Not all human-factors engineering and design is commercially successful. An example is the typewriter keyboard. Several alternative layouts, which are demonstrably superior from a human-factors point of view, have been proposed, beginning as far back as the s. Despite test results which show that alternative layouts are easier to learn, create less operator fatigue, and permit faster typing, the traditional layout persists and now has been carried over into the design of millions of personal computers. In this case, inertia and resistance to change have been more formidable obstacles to efficient ergonomic design than the design itself. Social problems The telephone, the space suit, and the typewriter keyboard are but three out of thousands of examples that might have been selected to show how human-factors engineering has been consciously applied to solve technological problems. The same human-factors principles and methods have also been applied to a variety of social problems, such as individualized computer-assisted instruction , nonlethal antiriot equipment for law enforcement agencies, antiterrorist architecture for public buildings, and people movers for airport and urban transportation departments.

## Chapter 2 : Different Research Methods - How to Choose an Appropriate Design?

*This is the only text on conduction research in the fields of ergonomics and human factors engineering. Pulling together noted experts from across the fields of human factors and ergonomics. Each chapter is a primer on the issues, methods, and tools used when conducting research in a particular.*

He used it to encompass the studies in which he had been engaged during and after World War II. A "human factor" is a physical or cognitive property of an individual or social behavior specific to humans that may influence the functioning of technological systems. The terms "human factors" and "ergonomics" are essentially synonymous. There are many specializations within these broad categories. Specialisations in the field of physical ergonomics may include visual ergonomics. Specialisations within the field of cognitive ergonomics may include usability, humanâ€"computer interaction , and user experience engineering. Some specialisations may cut across these domains: Environmental ergonomics is concerned with human interaction with the environment as characterized by climate, temperature, pressure, vibration, light. For instance, "user trial engineer" may refer to a human factors professional who specialises in user trials. According to the International Ergonomics Association , within the discipline of ergonomics there exist domains of specialization: Physical ergonomics[ edit ] Physical ergonomics: Physical ergonomics is concerned with human anatomy, and some of the anthropometric, physiological and bio mechanical characteristics as they relate to physical activity. Physical ergonomics is important in the medical field, particularly to those diagnosed with physiological ailments or disorders such as arthritis both chronic and temporary or carpal tunnel syndrome. Pressure that is insignificant or imperceptible to those unaffected by these disorders may be very painful, or render a device unusable, for those who are. Many ergonomically designed products are also used or recommended to treat or prevent such disorders, and to treat pressure-related chronic pain. Work-related musculoskeletal disorders WRMDs result in persistent pain, loss of functional capacity and work disability, but their initial diagnosis is difficult because they are mainly based on complaints of pain and other symptoms. These types of jobs are often those involving activities such as repetitive and forceful exertions; frequent, heavy, or overhead lifts; awkward work positions; or use of vibrating equipment. Cognitive ergonomics Cognitive ergonomics is concerned with mental processes, such as perception, memory, reasoning, and motor response, as they affect interactions among humans and other elements of a system. Organizational ergonomics[ edit ] Organizational ergonomics is concerned with the optimization of socio-technical systems, including their organizational structures, policies, and processes. History of the field[ edit ] In ancient societies[ edit ] The foundations of the science of ergonomics appear to have been laid within the context of the culture of Ancient Greece. A good deal of evidence indicates that Greek civilization in the 5th century BC used ergonomic principles in the design of their tools, jobs, and workplaces. In industrial societies[ edit ] In the 19th century, Frederick Winslow Taylor pioneered the " scientific management " method, which proposed a way to find the optimum method of carrying out a given task. Taylor found that he could, for example, triple the amount of coal that workers were shoveling by incrementally reducing the size and weight of coal shovels until the fastest shoveling rate was reached. They aimed to improve efficiency by eliminating unnecessary steps and actions. By applying this approach, the Gilbreths reduced the number of motions in bricklaying from 18 to 4. Bekhterev argued that "The ultimate ideal of the labour problem is not in it [Taylorism], but is in such organisation of the labour process that would yield a maximum of efficiency coupled with a minimum of health hazards, absence of fatigue and a guarantee of the sound health and all round personal development of the working people. Dull monotonous work was a temporary necessity until a corresponding machine can be developed. He also went on to suggest a new discipline of "ergology" to study work as an integral part of the re-organisation of work. The war saw the emergence of aeromedical research and the need for testing and measurement methods. Studies on driver behaviour started gaining momentum during this period, as Henry Ford started providing millions of Americans with automobiles. Another major development during this period was the performance of aeromedical research. Many tests were conducted to determine which characteristic differentiated the successful pilots from the unsuccessful ones. During the early s, Edwin Link developed the first flight simulator. The trend continued and more sophisticated simulators and test equipment were developed. Another significant development was in the civilian sector, where the effects of illumination on worker productivity were examined. This led to the identification of the Hawthorne Effect , which suggested that motivational factors could significantly influence human performance. It was no longer possible to adopt the Tayloristic principle of matching individuals to preexisting jobs. Now the design of equipment had to take into account human limitations and take advantage of human capabilities. There was substantial research conducted to determine the human capabilities and limitations that had to be accomplished. A lot of this research took off where the aeromedical research between the wars had left off. An example of this is the study done by Fitts and Jones , who studied the most effective configuration of control knobs to be used in aircraft cockpits. Much of this research transcended into other equipment with the aim of making the controls and displays easier for the operators to use. The entry of the terms "human factors" and "ergonomics" into the modern lexicon date from this period. It was observed that fully functional aircraft flown by the best-trained pilots, still crashed. In Alphonse Chapanis , a lieutenant in the U. Army, showed that this so-called " pilot error " could be greatly reduced when more logical and differentiable controls replaced confusing designs in airplane cockpits. After the war, the Army Air Force published 19 volumes summarizing what had been established from research during the war. It was the climate for a breakthrough. Alphonse Chapanis , Paul Fitts , and Small. Also, many labs established during WWII started expanding. Most of the research following the war was military-sponsored. Large sums of money were granted to universities to conduct research. The scope of the research also broadened from small equipments to entire workstations and systems. Concurrently, a lot of opportunities started opening up in the civilian industry. The focus shifted from research to participation through advice to engineers in the design of equipment. After , the period saw a maturation of the discipline. The field has expanded with the development of the computer and computer applications. Tolerance of the harsh environment of space and its effects on the mind and body were widely studied [19] Information age[ edit ] The dawn of the Information Age has resulted in the related field of humanâ€”computer interaction HCI. Likewise, the growing demand for and competition among consumer goods and electronics has resulted in more companies and industries including human factors in their product design. Using advanced technologies in human kinetics , body-mapping, movement patterns and heat zones, companies are able to manufacture purpose-specific garments, including full body suits, jerseys, shorts, shoes, and even underwear. Present-day[ edit ] Ergonomic evaluation in virtual environment In physical ergonomics, digital tools and advanced software allow analysis of a workplace. The body structure, sex, age and demographic group of the mannequin is adjustable to correspond to the properties of the employee. The software provides several different evaluations such as reachability test, spaghetti diagram, or visibility analysis. Human factors organizations[ edit ] Formed in in the UK, the oldest professional body for human factors specialists and ergonomists is The Chartered Institute of Ergonomics and Human Factors , formally known as the Institute of Ergonomics and Human Factors and before that, The Ergonomics Society. According to it mission statement, ACE unites and advances the knowledge and skills of ergonomics and human factors practitioners to optimise human and organisational well-being. The mission of the IEA is to elaborate and advance ergonomics science and practice, and to improve the quality of life by expanding its scope of application and contribution to society. As of September , the International Ergonomics Association has 46 federated societies and 2 affiliated societies. From the outset the IOM employed an ergonomics staff to apply ergonomics principles to the design of mining machinery and environments. To this day, the IOM continues ergonomics activities, especially in the fields of musculoskeletal disorders ; heat stress and the ergonomics of personal protective equipment PPE. Like many in occupational ergonomics, the demands and requirements of an ageing UK workforce are a growing concern and interest to IOM ergonomists. The International Society of Automotive Engineers SAE is a professional organization for mobility engineering professionals in the aerospace, automotive, and commercial vehicle industries. The Society is a standards development organization for the engineering of powered vehicles of all kinds, including cars, trucks, boats, aircraft, and others. The Society of Automotive Engineers has established a number of standards used in the automotive industry and elsewhere. It encourages the design of vehicles in accordance with established human factors principles. It is one of the most influential organizations with respect to ergonomics work in automotive design. This society regularly holds conferences which address topics spanning all aspects of human factors and ergonomics. Designers industrial, interaction, and graphic , anthropologists, technical communication scholars and computer scientists also contribute. Though some practitioners enter the field of human factors from other disciplines, both M. Methods[ edit ] Until recently, methods used to evaluate human factors and ergonomics ranged from simple questionnaires to more complex and expensive usability labs. Using methods derived from ethnography , this process focuses on observing the uses of technology in a practical environment. It is a qualitative and observational method that focuses on "real-world" experience and pressures, and the usage of technology or environments in the workplace. The process is best used early in the design process. This can be on a one-to-one interview basis, or in a group session. Can be used to gain a large quantity of deep qualitative data, [26] though due to the small sample size, can be subject to a higher degree of individual bias. Can be extremely costly. Also known as prototyping, the iterative design process seeks to involve users at several stages of design, to correct problems as they emerge. As prototypes emerge from the design process, these are subjected to other forms of analysis as outlined in this article, and the results are then taken and incorporated into the new design. Trends among users are analyzed, and products redesigned. This can become a costly process, and needs to be done as soon as possible in the design process before designs become too concrete. A supplementary technique used to examine a wide body of already existing data or literature to derive trends or form hypotheses to aid design decisions. As part of a literature survey, a meta-analysis can be performed to discern a collective trend from individual variables. Two subjects are asked to work concurrently on a series of tasks while vocalizing their analytical observations. This is observed by the researcher, and can be used to discover usability difficulties. This process is usually recorded. A commonly used technique outside of human factors as well, surveys and questionnaires have an advantage in that they can be administered to a large group of people for relatively low cost, enabling the researcher to gain a large amount of data. The validity of the data obtained is, however, always in question, as the questions must be written and interpreted correctly, and are, by definition, subjective. Those who actually respond are in effect self-selecting as well, widening the gap between the sample and the population further. A process with roots in activity theory , task analysis is a way of systematically describing human interaction with a system or process to understand how to match the demands of the system or process to human capabilities. The complexity of this process is generally proportional to the complexity of the task being analyzed, and so can vary in cost and time involvement.

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## Chapter 3 : Research Techniques in Human Engineering

*2. Developing a Research Project. Where Do I Start? Basic Human Engineering Research. Applied Human Engineering Research. Finding a Problem. Filling a Gap in Existing Research. Resolving Contradictory Experimental Results. Explaining the Occurrence of an Unexplained Fact. Reading for Problems.*

Biographies and References follows each chapter. The Evolution of Human Engineering: Where Are We Going? Developing a Research Project. Where Do I Start? Basic Human Engineering Research. Applied Human Engineering Research. Filling a Gap in Existing Research. Resolving Contradictory Experimental Results. Explaining the Occurrence of an Unexplained Fact. Turning a Problem Into a Testable Hypothesis. Threats to Research Validity. Threats to Internal Validity. Threats to External Validity. Suggestions for Further Reading. Review of Experimental Design. Stages in Experimental Research. Conducting a Usability Test. Who are the users? Tools of the Trade. User Surveys and Checklists. Assessing Costs and Benefits. Blank User Profile Worksheet. Selecting an Eye Tracker. Pilot Judgment and Decision Making. Crew Interactions and Cockpit Resource Management. States Experienced in Pilot Performance. Influences on Operator Performance. Research Methodologies in Consort. Who Are Older People? Age-Related Changes in Sensory Functioning. Age-Related Changes in Psychomotor Functioning. Field Surveys and Evaluations. Response Time to Displays. Component Evaluation - Seat Comfort. Experiments on Open Roads. Lessons from My Experience. Which Method is Best? Maintain an Automotive Context. Collect Data on the Road When Possible. Test Drivers of All Ages. Suggestions For Further Reading. Telecommunications Equipment and Service. Usability Methodologies as Applied to Telecommunications. Special Usability Methods Speech Quality. Telecommunications Network Transmission Objectives. Simple Voice Telephony Services. Distinctive Sounds for Telephone Tone Ringers. Additional Telephone Design Issues. Evaluation of Emerging Technologies. Additional Readings in Telecommunications. Nature of Consumer Products Research. The "Rapid Fire" Review Technique. Voice of the Customer. The Reality of Usability Testing. How to Get Buy-in from Management. Scope of the Chapter. Anthropometry Measures and Methods. Human Performance Measures and Methods. Measuring User Interface Effectiveness. Measures Computed from the Software. Measures Computed from Human Performance. Issues For Further Research. Industrial Ergonomics and Its Scope. Scope of This Chapter. The Nature of Research. Experimental Variables Measurement of Experimental Variables. Types of Human Strengths. Joint Angles and Body Posture. Measurement of Body Size Parameters. Health Care Personnel Shortages. Shortcomings in Medical Education. Medical Information and Communication System Deficiencies. Diagnostic and Treatment Equipment Deficiencies. Assessment of Medical Procedures on Patient Performance. Health Care Technology Assessment. The Methods of Technology Assessment. Technology Assessment and Ergonomics Practice. Public and Private Organizations. Research in Progress Publications. Uniqueness of the Military. Development of Specifications and Standards. Statistical and Methodological Issues. Questionnaires, Surveys, Interviews, and Protocol Analysis. Decision Making Under Stress. Use of Human Subjects in the Military. Women in the Military. What is Training Effectiveness? The Nature of Training Effectiveness Research. Measures Used to Assess Training Effectiveness. Example of a Training Effectiveness Measures Study. The Training Research Tool Box. Preface It was with considerable trepidation that I undertook the task of discussing the evolution of human engineering HE. How does one discuss the undefinable? Licht, Polzella and Boff extracted 74 different definitions from the literature, definitions for terms such as: The most inclusive terms are human factors and ergonomics. In the s an d s, the former term was usually associated with psychology mental workload and cognitive issues while the latter term was usually associated with physical work. Human Engineering and its analog Applied Ergonomics are concerned with the application of data derived from their respective traditions to the design, test and evaluation of equipment or systems. During the s and s, the boundaries between the terms Ergonomics and Human Factors have blurred as the use of the term ergonomics which originated in Europe increased in the United States.

## Chapter 4 : Human factors and ergonomics - Wikipedia

*A primer on the research issues and techniques for each human factors subdiscipline, this book brings together the works of some of the best human factors researchers, from Wickens to Willeges and from Boehm-Davis to blog.quintoapp.com of the fourteen chapters, covering a range of topics from consumer products, to medical devices, to military systems, is written by a noted expert in the area, and is a.*

Biographies and References follows each chapter. The Evolution of Human Engineering: Where Are We Going? Developing a Research Project. Where Do I Start? Basic Human Engineering Research. Applied Human Engineering Research. Filling a Gap in Existing Research. Resolving Contradictory Experimental Results. Explaining the Occurrence of an Unexplained Fact. Turning a Problem Into a Testable Hypothesis. Threats to Research Validity. Threats to Internal Validity. Threats to External Validity. Suggestions for Further Reading. Review of Experimental Design. Stages in Experimental Research. Conducting a Usability Test. Who are the users? Tools of the Trade. User Surveys and Checklists. Assessing Costs and Benefits. Blank User Profile Worksheet. Selecting an Eye Tracker. Pilot Judgment and Decision Making. Crew Interactions and Cockpit Resource Management. States Experienced in Pilot Performance. Influences on Operator Performance. Research Methodologies in Consort. Who Are Older People? Age-Related Changes in Sensory Functioning. Age-Related Changes in Psychomotor Functioning. Field Surveys and Evaluations. Response Time to Displays. Component Evaluation - Seat Comfort. Experiments on Open Roads. Lessons from My Experience. Which Method is Best? Maintain an Automotive Context. Collect Data on the Road When Possible. Test Drivers of All Ages. Suggestions For Further Reading. Telecommunications Equipment and Service. Usability Methodologies as Applied to Telecommunications. Special Usability Methods Speech Quality. Telecommunications Network Transmission Objectives. Simple Voice Telephony Services. Distinctive Sounds for Telephone Tone Ringers. Additional Telephone Design Issues. Evaluation of Emerging Technologies. Additional Readings in Telecommunications. Nature of Consumer Products Research. The "Rapid Fire" Review Technique. Voice of the Customer. The Reality of Usability Testing. How to Get Buy-in from Management. Scope of the Chapter. Anthropometry Measures and Methods. Human Performance Measures and Methods. Measuring User Interface Effectiveness. Measures Computed from the Software. Measures Computed from Human Performance. Issues For Further Research. Industrial Ergonomics and Its Scope. Scope of This Chapter. The Nature of Research. Experimental Variables Measurement of Experimental Variables. Types of Human Strengths. Joint Angles and Body Posture. Measurement of Body Size Parameters. Health Care Personnel Shortages. Shortcomings in Medical Education. Medical Information and Communication System Deficiencies. Diagnostic and Treatment Equipment Deficiencies. Assessment of Medical Procedures on Patient Performance. Health Care Technology Assessment. The Methods of Technology Assessment. Technology Assessment and Ergonomics Practice. Public and Private Organizations. Research in Progress Publications. Uniqueness of the Military. Development of Specifications and Standards. Statistical and Methodological Issues. Questionnaires, Surveys, Interviews, and Protocol Analysis. Decision Making Under Stress. Use of Human Subjects in the Military. Women in the Military. What is Training Effectiveness? The Nature of Training Effectiveness Research. Measures Used to Assess Training Effectiveness. Example of a Training Effectiveness Measures Study. The Training Research Tool Box.

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