Chapter 5
Training Delivery Methods

Introduction

The delivery of properly prepared training and education can be quite simple or extraordinarily complex. The type of material being taught determines, to a great degree, the method of delivery. This chapter will address individualized instructional approaches as well as group training methods, including technology-based training in both categories.

Delivery methods have sometimes been grouped under the general heading "Implementing the Curriculum." The elements and criteria included in implementing a curriculum are generally broader than those in simply determining the delivery method. Prior to addressing the delivery methods and in an effort to accommodate the topic comprehensively, we will first address the issues which must be considered in implementing a properly developed curriculum.

Integration of Courses

The first key decision in the sequencing of courses is the determination of core courses, skills, knowledge or abilities. If they are "core" then, by definition, they should be shared by all participants. The integration of courses in a curriculum conform perfectly to the "Curriculum Spiral" described earlier. Because we have discussed that topic thoroughly, we will not replicate it here other than to advise that it must be a consideration in the delivery of courses in a curriculum. There must be a continuity of courses such that the prerequisites are made available first and the specialized courses or skills available later. "Expert Bypass" is the proposition that "trainees demonstrating competence before an instructional module are allowed to skip it" (See, for example, Mallory and Steele[1] in Kelly's book[2]). Clearly this sequencing suggests that there are definable and testable competencies for particular skills and skill levels.

School-based Learning

The historically dominant method of instruction in the United States in the past century has been the

school-based experience. This necessitates student or participant travel to the facility for instruction. This facility may be call a laboratory, college, center, or simply school. It presumes that it is more expedient for participants to travel to a centralized location for training, education and study than for the instruction to be provided at the work-site. Community colleges, technical schools, and vocational schools have taken the traditional concept of centralized instruction and melded it slightly by making the instruction centralized but more accessible. The rationale for school-based or centralized learning experiences rests with either efficiency or effectiveness.

It would be grossly inefficient for instruction to be transported to each individual trainee or learner, unless the trainee's time were more valuable than the instructors or there were travel limitations on the trainee. If there are individual trainees, seeking similar instruction, who are reasonably mobile, it is generally more efficient to require that they travel to a central location for the instruction. This historical rule-of-thumb is reinforced if there are idiosyncracies regarding the facility, such as instructional materials, library, media materials, or specialized equipment which make it in-expedient to transport the training to the general area of the trainee. In these instances there could well be one centralized facility for specialized instruction which could not be replicated elsewhere.

A hybrid or compromise to the centralized facility model but still in keeping with the school-based instruction, is that exemplified by vocational schools, community colleges, and technical schools, which have branched into relatively remote areas and communities. These provide greater accessibility without too much compromise of the advantageous facilities for learning.

Within the training environment, it is not unusual for training to be regionalized when materials can be transported less expensively than transporting all of the diverse trainees who might attend. Hotels, conference centers, and other meeting facilities can serve as school-based instructional platforms, particularly if the instruction is primarily lecture or presentation of materials. When demonstrations or specialized, immobile equipment or materials are necessary for the instruction, it is necessary that the school-based instruction be held at a particular facility and a compromise would affect the quality or content of the instruction.

Work-based Learning

In spite of the historical precedent of school-based instruction, more technical and skills training courses are conducted in the work-place. This appears to be the venue for the most realistic experiences the participant can have if the skills learned are to be applied in the workplace. Work-based learning has distinct advantages, even for traditional college or university students.[3] For technical and skills training, work-based instruction again rests on the determination of efficiency and effectiveness. If there are sufficient numbers of participants who need or desire the instruction, it may be feasible for the instructional unit, including instructor and materials, to travel to the work-site. Clearly this is advantageous to the trainees since they are inconvenienced the least. In this instance, it would be more *efficient* to provide work-based instruction.

Efficiency is not the prime consideration, however, in selecting work-based instruction. An artificial environment such as a school or even a training facility, may not provide the best, most realistic surroundings for training knowledge, skills, and abilities which must be operationalized in the

workplace. Granted, many agencies and organizations have attempted to replicate the workplace for training purposes. The U.S. Mine Safety Enforcement Administration has replicated a mine at the national training facility; the Federal Bureau of Investigation has replicated an urban setting for firearms training; the Federal Law Enforcement Training Center has utilized homes and other buildings for mock searches and crime-scene investigations instruction; and, Kentucky Fried Chicken headquarters has a fully operational KFC restaurant inside its management training facility, complete with and indoor drive-through, for training purposes. These are just some examples of the degree to which organizations go to replicate the workplace. The mere replication of the workplace implies the preference for that as the stage for training. In all but one of these examples, the issues involve safety of participants and bystanders. Clearly, there cannot be live-firing exercises in urban areas for the training of personnel. These examples do, however, point to the effectiveness of training in the workplace as the best opportunity to apply immediately the instruction received.

The most appropriate facility "is one that facilitates, rather than impedes, the achievement of the training objectives" (See, for example, West[4] and Kelly[5]). This comment, while obvious to the point of being a truism, suggests that it is important to again address the issue of instructional or learning objectives when addressing school-based (centralized) instruction, blended school-based (regionalized) instruction, or work-based (localized) instruction.

Training Environs

Objective (Bloom's Levels of Cognition)	Centralized	Regionalized	Localized
Knowledge	XXX	XXX	XXX
Knowledge of Specifics	XXX	XXX	XXX
Knowledge of ways to deal with Specifics	XX	XXX	XXX
Knowledge of Principles and theories	XX	XXX	XXX
Comprehension	X	XXX	XXX
Translation	X	XXX	XXX
Interpretation	X	XXX	XXX
Extrapolation	X	X	XX
Application	XXX	XX	XXX
Analysis	XXX	XX	XXX
Analysis of Elements	XXX	XX	XXX
Analysis of Relationships	XXX	XX	XXX
Analysis of Organizational principles	XXX	XX	XXX
Synthesis	XXX	XX	XXX
Evaluation	XXX	XX	XXX

X's indicate the perceived strength of the approach at the level of cognition

This matrix does not capture the nuances and issues inherent in each training location. As stated above, specialized equipment, advantageous support services such as library, information, or a variety of experiences as well as the sensitivity of the training, may necessitate or negate certain

locations or facilities. Generally, the more general the training, such as within the category of "Knowledge," the less important it is where the training occurs, or, as we will see below, how the training occurs. It is generally better, however, for work-related training to occur in the circumstances and surroundings most like the work environment, which, in most cases, is the work-site.

Individualized Instruction

As with every other topic related to curriculum development and delivery, individualized instruction is complex and requires that several components be address simultaneously. The five components associated with individualized instruction according to Finch and Crunkilton[6] are:

- student
- instructional content
- instructional media
- instructional strategies
- instructional environments

According to Finch and Crunkilton, the organization of the components revolve around the student, as shown in the following graphic.
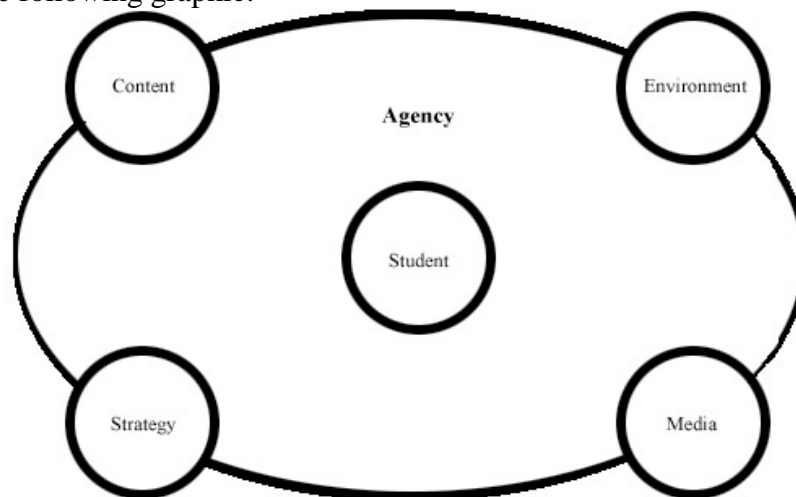
Individualized instruction, as the name suggests, seeks to accommodate the specific needs of the individual student and provide "whatever arrangements are necessary to ensure that each student will be constantly engaged in learning those things that are of greatest value to himself or herself."[7] Such an approach is instruction-intensive and presumes that the purpose of instruction is to augment the *individual's* abilities.

This is in contrast to a group learning experience or the delivery of instruction at the request of or to benefit an organization where the objective is to enhance individual performance as it relates to a group, team or organization. Typically individualized instruction may be preferable but unrealistic. Hybrids of this approach use diagnostic tools to determine each individual's progress and stage so that the instruction can accommodate the individual but within the organizational exigencies.

The model presented below depicts a process of determining the content of a curriculum or course, the strategy to be used in the delivery of the content, the media most appropriate, and the instructional environment, all within the context of the agency or organization. This model changes the dynamics of the instruction significantly because it makes central the agency or organization, not the participant. This model is more appropriate for contract training than for traditional education.
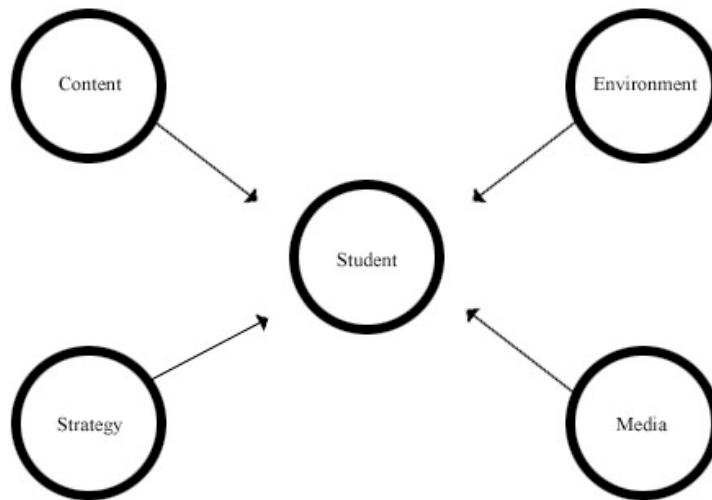
In this graphic, the student is still the central element for instruction but the context is one of agency or organizational imperatives.

Individualized instruction is an extremely valuable educational model of delivery. Reynolds provides us with more than simply the centrality of the learner in his definition of "Individualized Instruction:"

> An instructional technique in which the instruction is designed to be used by individual learners. The learner is taught only the material that is not already known, instead of taught everything in a specified curriculum as is true of traditional instruction. This is more than learners simply working on materials without regard to the activities of other learners in the same class. All individualized instruction is self-paced instruction. But not all self-paced instruction is individualized.[8]

It is clear from Reynolds' description that individualized instruction is always competency-based. The objective is to provide the individual with the knowledge, skills, and abilities needed to do the job specified.

Since individualized instruction is competency-based and self-paced, there are several delivery techniques which apply. Independent studies and self-directed instructional packages are very appropriate. Additionally, technology based training is amenable to individualized training.

Computer-assisted instruction is an effective approach in delivering individualized instruction. It is, however, only one medium for the delivery of training.

Description of Instructional Delivery Methods

As mentioned earlier, there are as many methods of delivering training as there are methods of communicating. Since the most appropriate methods vary by function, anticipated performance, jurisdictional imperatives, learning objectives, and resources, it is not possible to provide a prescription for the correct method to use. Some of the approaches introduced earlier but restated here with greater clarity are:

> *Central Location Training*: Some training courses are best offered in central locations. The reasons for transporting participants to central or regional locations can include issues such as models, rare equipment, instructional continuity, and the like. The important issue to remember is the centrality of the educational objective. It should guide the selection of the material and the selection of the most appropriate location for the dissemination of information. The more complex and technical the instruction, typically, the more likely it should be delivered in a specially suited environment. This environment may well be a centralized location or it could be that the more appropriately suited environment for complex training is the "work-site" since that is the location of the most realistic applications. As mentioned below when addressing computer-assisted instruction, "fidelity" or complexity of the information becomes an issue in determining if training should be centralized or decentralized. Another consideration is the heterogeneity of the participants.

If economies of scale do not allow on-site training, they may suggest centralized facility training. Previously labeled "school-site" training, centralized instruction is the traditional method of instruction and, with traditional educational objectives, it is the default method. With professional training, it is often the secondary, rather than the primary method, since the work-site is the location for the training to be applied. Educational objectives at the highest levels of the taxonomy are appropriate for this type of "work-site" instruction.

> *On-site Training or Work-site Training*. This traditional method of professional training could be offered at agency-specific locations, jurisdiction-specific locations, or regionally (although it becomes more like central location or school-site instruction if regionalized facilities are selected in order to reduce participant costs and not for the purpose of taking advantage of certain localized equipment or facilities). This is, arguably and with all other things being equal, the most appropriate training location for professional training, particularly that which is skill-oriented, and linked to variances in equipment or logistical support. "Work-site" training carries with it the *exact* conditions under which the participant must work when and if it is necessary to employ the information or activities learned. With traditional educational objectives, this is the secondary method or location of delivery but with professional training, it is frequently the primary or default method and location. Mitigating factors include the presence or absence of conflicting and complicating variables. Educational objectives at the highest levels of the taxonomy are appropriate for this type of "work-site" instruction.

> *TV/Video Instruction*. Many agencies and clientele would find it difficult if not

impossible to attend training sessions of sufficient length to address complex issues. Similarly, there may be too few participants at a single location to merit work-site training but there are those who could utilize structured training. Passive, capsulized training or instructional vignettes may be appropriate for some audiences, depending on the sensitivity of the topic and the information. This information and instruction may be disseminated through television or video. This medium is well suited for update training and non-complex, awareness instruction.

Televised instruction can easily be interactive and distance learning initiatives are developing quickly in every field of education. This moves the instruction from entirely passive to more of an active or participatory endeavor. No matter how interactive the process, there is still an element of artificiality which may adversely impact some instruction in the higher levels of educational objectives in the cognitive and psychomotor domains. This delivery method may be quite effective in the dissemination of information to large audiences, in varied or remote locations, when the information is at the lower levels of the taxonomies of educational objectives.

Computer-based Instruction. This method may incorporate Internet instruction with the now established computer-based models for delivery of instruction to different audiences. This approach offers the most flexibility for the clientele. Reynolds provides us with six modes during which computer-based instruction may be appropriate:

- Tutorial
- Drill and Practice
- Instructional Game
- Modeling
- Simulation
- Problem Solving

The typical tutorial session may provide the learner with information, refresh the learning of the information through prompts, and then check the understanding of the information through self-paced testing. The result is a reinforcement of the learning of information as well as an instant assessment of the learning. The merit of computer-based instruction, as used here, is its role in the instructional process. The tutorial function is a mildly active, not passive, system for instilling information and insight and then reinforcing the information.

Drill and practice is a variation on the reinforcement process. Through repetition and immediate feedback, the learner reinforces correct information and does not develop pathways for incorrect information. This, along with the "tutorial" sessions, are good practice for learning terminology or specific information, again, at the lower levels of the taxonomy of educational objectives.

Instructional games, as an instructional technique, as pointed out by Reynolds "does not mean frivolous activity."[9] Rather, it is a programed method of accomplishing the learning objectives in an organized fashion which uses scenarios as methods of stimulating learning through following rules to overcome barriers or problems. This method is effective in practicing step-by-step processes but still carries an element of artificiality.

Modeling is "the use of the technology-based system to represent another system or process" which is likely to be quasi-realistic in its assumptions and characteristics but still represents a fictitious example.[10]

Simulation, as used in computer-assisted instruction, is the use of a fictitious but representative situation or device which has a high degree of fidelity to provide practice for the learner. It is a method of applying the information or processes learned, again with immediate feedback, to reinforce (or alter) the learning. Live simulation will be described in the next chapter as a means, arguably the most sophisticated means, of evaluating processes, but here it is used as a method of computer-based instruction to teach and reinforce teaching. It is more of a process of "practice" than of training or teaching. Simulation presumes some base-line knowledge and, in most cases, complex knowledge. The simulation is an opportunity to practice that which has been learned. It is often assumed that high fidelity is better but that is not necessarily the case. The more complex the initiative, the more complex the simulation. "Fidelity" is often a term used to describe the complexity, not just the pixels of the display of the simulation. The clarity of the representation of the problem or dilemma addressed by the simulation is, of course, important. This is often called for in military simulations.[11]

Problem Solving has been one of the least useful applications of computer-assisted instruction. It seems counter-intuitive that a technologically advanced tool, like the computer, would not be perfectly suited to the higher levels of learning but that is not necessarily the case. Computer-assisted instruction is interactive, to a degree. There may be infinite possibilities in a problem or issue but only those methods that have been predicted and programmed are likely to be successful. This can be affected by the complexity of the program, the simplicity of the project or problem, and the limitations on innovation in dealing with the problem. Supporting the use of computers in complex instruction, however, is the development of programs that can learn as the participant presents it with new and unanticipated methods of responding to the problems. These "expert systems" are developing at a fast pace and may prove to be very effective.

It is clear that these methods of delivering individualized instruction are malleable and can be varied to meet the exigencies of the situations. One suggestion made in the literature is to tailor computer-assisted instruction into "computer-supported learning resources" especially for more complex tasks

and analyses or problem solving.[12] It should be warned, however, that computer-based instruction is generally a difficult medium for the training and education at the highest levels of the educational objectives. This is especially true where alternatives to action or responses are unlimited or where realism is important. Simulations are also limited. Within medicine, simulators are being used for surgery; within aviation, simulators have long been used to "train" pilots; and firearms simulators are being used to train and evaluate law enforcement officers in their judgement as well as skill. There is, of course, less risk of harm using computer models and simulations but there is also the assumption that basic or even complex knowledge, skill and ability is already present. The "simulators" are more for practice or evaluation than for initial training.

Whatever the method or approach to the delivery of instruction, virtually all research and literature on the topic of instruction suggests that there be a reliable and valid assessment of the information assimilated by the participants. Exposure to information does not insure assimilation of information. Some instructional approaches may prove to be better than others in the transfer of information and the development of performance. Learning objectives and behavioral objectives, key elements of any syllabus, are hollow unless measured. Each instructional component, class, video, etc. should have an assessment of information understood and retained by the recipient. Tests may not be the best method of assessing the instructional impact and many other methods are available for consideration, such as simulators described above. Regardless of the method, the recipients' ability to synthesize knowledge, skills and abilities is essential and should be measured to judge the impact, efficacy, and appropriateness of the instruction.

The matrix below captures some of the general tenets of the locale of individualized training.

Approaches to Individualized Training Delivery

Objective (Bloom's Levels of Cognition)	Centralized	On-site	TV/Video	Computer
Knowledge	XX	XX	XXX	XX
Knowledge of Specifics	XX	XX	XXX	XX
Knowledge - ways to deal with Specifics	XX	XX	XX	XX
Knowledge of Principles and theories	XX	XX	XX	XX
Comprehension	XX	XX		XX
Translation	XX	XX		XX
Interpretation	XX	XX		XX
Extrapolation	XX	XX		X
Application	XXX	XXX		x
Analysis	XX	XX		X
Analysis of Elements	XX	XX		X
Analysis of Relationships	XX	XX		X
Analysis of Organizational principles	XX	XX		X
Synthesis	XX	XX		
Evaluation	XX	XX		

X's indicate the perceived strength of the approach at the level of cognition

Curricula, to be defensible, appropriate, and valid, must consider the elements listed above. This consideration is typically included in a needs assessment which identifies the gaps associated with each element. Gaps are the focus of training because it is not productive to provide training on existing capabilities, unless they are to be revised and altered or applied differently.

Group Instruction

A viable alternative to individualized instruction, and one which is often preferred, is group instruction or training. Some of the concepts described above apply equally to group instruction and to individual instruction but here we will address the group training experiences, potential, advantages and disadvantages, as a delivery method.

Ruyle describes the advantages of group training:

> Group training, especially when using lecture and discussion methods, can be developed and delivered quickly to a large number of people. A competent trainer generates enthusiasm for the subject matter and can effectively coach learners, especially in psychomotor skills.[13]

Ruyle goes on to describe the "synergy" which can evolve from a group training session and experience. The following list clearly delineates the opportunities which appear to favor group instruction:

- Information must be conveyed to large number of people,
- Training must be developed and delivered quickly,
- A skilled instructor is available,
- Learners lack basic skills,
- Learners are not skilled in self-study and/or self-evaluation,
- Subject matter is particularly difficult to grasp without intervention from an instructor,
- Learners can be brought together in one place and on a set schedule for instruction, and,
- Complex psychomotor skills must be learned and practiced.[14]

Some of these items are consistent with "work-site" or localized training described under "Individualized Instruction" but here there is a recognition of the primacy of the group or team, not just some collection of individual learners who happen to be in the same area or even the same agency. The mention of a "skilled trainer" does not appear to suggest that when there is not a skilled trainer, individual training is more appropriate. It appears that the intention is to suggest a different type of skill involved when, for example, demonstrations are needed in order to give the learner the information and insight they need to perform properly.

While individual instruction might result in groups being able to perform together, the intention is to prepare the *individual* to perform a task or activity. Group training is most appropriate when the *group* is expected to perform together. The approaches adopted by the instructor to accommodate group instruction are:

- Lecture
- Discussion
- Demonstration
- Case Studies
- Role Playing
- Games (Simulations)

Each of these approaches have advantages and disadvantages, as described by Ruyle:

Lecture

When to Use: If efficiency is desired; if large amount of information is to be disseminated; if the audience is large; if information is "introductory" or if it is followed by instruction with greater depth; if flexibility is needed; if objective is to convey simple, straightforward facts.
When to Avoid: If affective or psychomotor skills are being taught; if high level cognitive skills are being taught; if concepts are complex or detailed.

Discussion

When to Use: If lectures are to be enhanced; if group is small (20 or fewer); if instructional goals include critical thinking skills; if instructor needs to gain periodic feedback on learners' understanding and attitudes.
When to Avoid: If participants have limited background on the subject; if content consists of clear, straight-forward principles and allows little variation.

Demonstration

("A dramatized explanation of a product, process or procedure") *When to Use*: If tasks require manual dexterity; if tasks are difficult to conceptualize; if the process of actions or procedures is important to represent in the instruction; if complex actions or procedures are being taught.
When to Avoid: If the process is dangerous; if the process poses risk to the learner or the environment; if the information is so simple that an advanced demonstration would be inappropriate.

Case Study

(An event or circumstance which presents a problem to be solved or situation to be analyzed for instructional purposes") *When to Use*: If bridging theory and practice; if critical thinking skills are being taught; if application, analysis, and synthesis are objectives; if realism is important.
When to Avoid: If learners do not have a good understanding of the rudiments of the topic or activity; if prerequisite skills are absent; if lower levels of the taxonomy or educational objectives are being taught - knowledge, understanding.

Role Playing

("A contrived event, situation, or circumstance acted out by trainees for instructional purposes" NOTE: This is consistent with Simulations and Games and will be collapsed into one category. Later we will refer to this amalgam as a form of Exercises) *When to Use*: If application of knowledge, skills and abilities is being sought; if management, supervision, and

> interaction of events or circumstances is important; if sufficient time is available; if highest levels of educational objectives are being taught; if application of learned experiences and processes is important.
> *When to Avoid*: If basic skills are not present; if training is at lower levels of taxonomy; if sufficient time is not available.[15]

The discussion of the methods and attributes of group methods of training fits the taxonomy precisely and many of these methods were described using the terms in the taxonomy:

Group Instruction Methods Applied to Educational Objectives

Objective (Bloom's Levels of Cognition)	Lecture	Discussion	Demonstration	Case Study	Role Play
Knowledge	XX				
Knowledge of Specifics	XX				
Knowledge-ways to deal w/Specifics	XX				
Knowledge of Principles and theories	XX				
Comprehension	X	XX	X		
Translation	X	XX	X		
Interpretation	X	XX	X		
Extrapolation	X	XX	X		
Application	x	XX	XX	X	X
Analysis		X	XX	X	XX
Analysis of Elements		X	XX	X	XX
Analysis of Relationships		X	XX	X	XX
Analysis of Organizational Principals		X	XX	X	XX
Synthesis			X	XX	XX
Evaluation			X	XX	XX

X's indicate the perceived strength of the approach at the level of cognition

Based on the prominent literature in curriculum development and delivery, it appears that for the training aimed at the higher levels of the educational objectives, it is critical that methods of delivery more sophisticated than lecture and discussion are appropriate. This is true of individualized instruction as well as group instruction but more critical for the later category than the former.

Consistent with the curriculum development discussion, the following table extracted from Kern,

et al[16] provides us with a description of the most appropriate methods of delivery, based on the type or category of the learning objectives and the domains in which they are present:

Instructional Methods	Type of Objective				
	Cognitive: Low	Cognitive: High	Affective	Psychomotor: Competence	Psychomotor: Performance
Readings/Video	XXX	X	X	X	
Lecture	XXX	X	X	X	
Discussion	XX	XX	XXX	X	X
Problem-solving exercises	XX	XXX	X		X
Programmed learning	XXX	XX		X	
Learning projects	XXX	XXX	X	X	X
Role projects		X	XX	X	XX
Demonstration	X	X	X	XX	XX
Real-life experiences	X	XX	XX	XXX	XXX
Simulated experiences	X	XX	XX	XXX	X
Video review	X			XXX	X

In this table, the instructional methods can be described as most appropriate if:

Readings/Video -	Learner in a passive role.
Lecture -	Learner in passive role, information able to be verbalized.
Discussion -	Learner in a more active role, feedback immediate.
Problem-solving exercises -	Active learning with problem solving skills reinforced.
Programmed learning -	Material organized and presented in sequential, modular fashion.
Learning projects-	Active, self-paced, ipsative, may involve simulations, involves problem-solving, applications.
Role projects -	Appropriate for psychomotor skills, experience different roles.
Demonstration -	Passive learning for more complex skills, psychomotor especially.

Real-life experiences -	Necessary to understand, appreciate, experience - affective and psychomotor.
Simulated experiences -	Evaluation as well as training is needed.
Video review -	Evaluation, reassessment, repetition are sought.

What is reinforced here is the utility of educational objectives in each of the domains continuing to play a central role in the determining the delivery of training.

Non-Outcome-Based Instruction versus Outcome-Based Instruction

The final consideration made in the delivery of the instruction is the expectation of outcome. While it would be logical that every instructional approach, medium, and technique would have an outcome if it is based on objectives, the issue here is whether the outcome is concrete enough to be identified and labeled. If so, it should fit into categories of:

- Generic or Non-specified Outcome Instruction
- Performance-based Instruction
- Competency-based Instruction

Those courses or curricula with no specified outcomes or expectations are sometimes referred to as generic or "foundational" instruction.[17] While it may seem ill-advised to construct such a curriculum or course, and it is contrary to most of the literature on curricular design, it may be appropriate at times to provide instruction to a broad array of persons but without articulated objectives other than insight or awareness. This type of course might fit within the affective domain but this is appropriate only for the lowest levels of the taxonomy of educational objectives.

Performance-based instruction carries clear expectations for achievement and these expectations should be consistent with the learning objectives. The expectations are also the basis for the assessment or evaluation of the courses, curriculum and participants. Additionally, the expectations should be consistent with the task analysis or similar system which produced them.

Similarly, competency-based instruction has, by definition, particular accomplishments linked to the instruction. The delivery of competency-based instruction and performance-based instruction is sequential, lends itself to modularization, consistent with the "curricular spiral" and role-playing, case studies and simulations - delivery methods for higher level educational activities.

In the matrix below, we have attempted to specify the types of educational objectives in the cognitive domain which apply to different outcome-based instructional techniques.

Instructional Delivery by Outcome Basis

Objective (Bloom's Levels of Cognition)	No Outcomes	Performance-Based	Competency-Based
Knowledge	XXX	XXX	XXX
Knowledge of Specifics	XXX	XXX	XXX
Knowledge - ways to deal with Specifics	XX	XXX	XXX
Knowledge of Principles and theories	XX	XXX	XXX
Comprehension		XXX	XXX
Translation		XXX	XXX
Interpretation		XXX	XXX
Extrapolation		X	XX
Application		XX	XXX
Analysis		XX	XXX
Analysis of Elements		XX	XXX
Analysis of Relationships		XX	XXX
Analysis of Organizational principles		XX	XXX
Synthesis		XX	XXX
Evaluation		XX	XXX

X's indicate the perceived strength of the approach at the level of cognition

A key difference between foundational or generic instructional delivery and outcome-based delivery is the potential for modularized instruction. It is often not feasible for generic, basic instruction to be offered in modules since it has no precipitating objectives and no identifiable outcome objectives. It is quite consistent with the literature for either competency-based or performance-based instruction to fit into modules, and even advantageous to define the modules, based on enabling objectives, so that the instruction has a sequential logic. Finch and Crunkilton suggest that centralized or "school-site" instruction is most appropriate for core or basic knowledge skills while "work-site" instruction is most appropriate for specialized or complex instruction.[18]

Train-the-Trainer Programs

An efficient and potentially effective method of delivering instruction to the work-site, again, where the most effective training often occurs, is a train-the-trainer program. While it appears attractive conceptually, it is actually very difficult to develop a credible train-the-trainer program. Segall[19] describes the process of developing an effective trainer. She recommends that all trainers have a detailed job description which includes the roles, responsibilities and expectations. These job descriptions will vary based on the audience, the complexity of the topic, and the position of the learning objectives. The higher the level of the educational objective, the higher the level of expertise needed. She suggests that a train-the-trainer program should require the same skills of the missionary trainers as for any other trainers. Said differently, the train-the-trainer program should not "dumb-down" any of the information but should have higher expectations for the participants than other instructional programs.

She suggests five very specific elements of a train-the-trainer program:[20]

- Describe each of roles expected of those who complete a train-the-trainer program in behavioral terms, that is, what is expected of them as instructors, as evaluators, and as needs analysts (she suggests that instructors serve an important function of assessing needs based on participants' skill levels);
- Measure the trainer's current level of expertise against the desired levels to determine deficiencies;
- Outline a training program that spells out the expected level of proficiency for each developmental area, based on work experiences and educational experiences. If the participant needs adult-learning training, group-process training, active listening skills, feedback skills, negotiation skills, presentation skills, these should be evident if the first two bullets (above) have been accomplished;
- Deliver the training needed to accommodate the expectations;
- Certify training competencies by having the participant demonstrate them in a training session.

The tasks are simple, she says, if expectations are defined, measured, taught, and tested. If portions are ignored, the task is difficult, if not impossible.

Train-the-trainer programs are very attractive because they accommodate both efficiency (take the training back to the greatest number of participants) and effective (provide the instruction in the work-site environment where it will ultimately be used). It should be stressed that this method is useful only if it is conducted properly, otherwise it is potentially worse than no training.

Summary

The delivery method selected for a course, curriculum or model is heavily dependant upon the learning objective. In this section we discussed school-based versus work-based learning opportunities, with advantages and disadvantages of each. Efficiency and effectiveness are the key issues in the location of a training program or course. If it is cost-effective to bring participants to a central location and if it does not compromise the participant's ability to perform the tasks, activities, or skills when they return to the environment where the information must be applied, centralized or regionalized instruction is often appropriate. If work-site skills and activities are of highest importance, and it is efficient to transport the instructional-delivery to the participant, this is the best, most effective method. Efficiency and effectiveness are sometimes incompatible. A professional and properly conducted train-the-trainer program can accommodate both. It must, however, clearly define the expectations, measure the participants against the expectations, teach the participants, and evaluate their abilities through demonstrations.

We also addressed issues associated with individualized instruction versus grouped instruction. Sometimes these issues are similar to those surrounding centralized and decentralized instruction, but it is critical to determine the level of performance or competency desired in each of the types. We described different specific methods of delivering the instruction to the participants. These methods must fit the educational objectives. It is useful to replicate the table developed by Kern, et

al. In showing the synergism of the instructional delivery method and the educational objective:

Instructional Methods	Type of Objective				
	Cognitive: Low	Cognitive: High	Affective	Psychomotor: Competence	Psychomotor: Performance
Readings/Video	XXX	X	X	X	
Lecture	XXX	X	X	X	
Discussion	XX	XX	XXX	X	X
Problem-solving exercises	XX	XXX	X		X
Programmed learning	XXX	XX		X	
Learning projects	XXX	XXX	X	X	X
Role projects		X	XX	X	XX
Demonstration	X	X	X	XX	XX
Real-life experiences	X	XX	XX	XXX	XXX
Simulated experiences	X	XX	XX	XXX	X
Video review	X			XXX	X

Higher level objectives require particular delivery methods to be effective.

Once again, we described the essential need to define performance levels or competencies if instruction is to be meaningful. Delivery methods for competency-based instruction may include individualized instruction while delivery methods for performance-based instruction may most often be grouped methods. Ideally, the instruction for performance-based learning would be group, work-site instruction, incorporating discussion, demonstration, and real-life experiences.

Notes to Chapter Five

1. Mallory, W. J. and J. R. Steele. (1994). "Assessment of the Options." In Leslie Kelly (Ed.),The ASTD Technical and Skills Training Handbook. New York: McGraw Hill, p. 270.

2. Kelly, Leslie. (1994). The ASTD Technical and Skills Training Handbook. New York: McGraw Hill.

3. Finch and Crunkilton, 1999:Finch, Curtis R. and John R. Crunkilton. (1999). Curriculum Development in vocational and Technical Education: Planning, Content, and Implementation. Boston: Allyn Bacon, p. 252.

4. West, Eileen. (1994). "Technical Training Facilities and Equipment." In Leslie Kelly (Ed.),The ASTD Technical and Skills Training Handbook. New York: McGraw Hill, p. 346.

5. Kelly, Leslie. (1994).The ASTD Technical and Skills Training Handbook. New York: McGraw Hill.

6. Finch, Curtis R. and John R. Crunkilton. (1999). Curriculum Development in Vocational and Technical Education: Planning, Content, and Implementation. Boston: Allyn Bacon.

7. Finch, Curtis R. and John R. Crunkilton. (1999). Curriculum Development in Vocational and Technical Education: Planning, Content, and Implementation. Boston: Allyn Bacon, p. 254.

8. Reynolds, Angus. (1994). "Individualized Instructional Approaches." In Leslie Kelly (Ed.),The ASTD Technical and Skills Training Handbook. New York: McGraw Hill. 289-318.

9. Reynolds, Op. cit, p. 306.

10. Reynolds, Op. cit, p. 307.

11. See Schwabe, W. (1990). Analytic War Plans: Adaptive Force-employment Logic in the Rand Strategy Assessment System. Santa Monica: RAND; Hillestad, R. J., and M. L. Juncosa. (1993) Cutting Some Trees to See the Forest: On Aggregation and Disaggregation in Combat Models. Santa Monica: RAND; General Accounting Office.(1995). Military Training Cost-Effective Development of Simulations Presents Significant Challenges.Washington, DC.

12. Reynolds, op. Cit., p. 311.

13. Ruyle, Kim E. (1994). "Group Training Methods (Detailed)."   In Leslie Kelly (Ed.),The ASTD Technical and Skills Training Handbook. New York: McGraw Hill. 319-338.

14. Ruyle, Op. cit. P. 321.

15. Ruyle, Op cit, p. 322-330.

16. Kern, David E., Patricia A. Thomas, Donna M. Howard, and Eric B. Bass. (1998). <u>Curriculum Development for Medical Education: A Six-step Approach</u>. Baltimore: Johns Hopkins, p. 40.

17. Finch, Curtis R. and John R. Crunkilton. (1999). <u>Curriculum Development in Vocational and Technical Education: Planning, Content, and Implementation</u>. Boston: Allyn Bacon, p. 34.

18. Finch, Curtis R. and John R. Crunkilton. (1999). <u>Curriculum Development in Vocational and Technical Education: Planning, Content, and Implementation</u>. Boston: Allyn Bacon, p. 35.

19. Segall, Linda J. (1994). "Selecting and Supporting the Technical Trainer."   In Leslie Kelly (Ed.),<u>The ASTD Technical and Skills Training Handbook.</u> New York: McGraw Hill. P. 117-142.

20. Segall, op. Cit., p. 140.