SYSTEMATIC INSTRUCTION PROCEDURES:
STRATEGIES FOR ORGANIZING INFORMATION

THE ROLE OF SYSTEMATIC INSTRUCTION

The challenge of any instructional approach to be used in the facilitation of community-based, integrated opportunities for persons with severe disabilities is that the approach must be effective for each individual and must be compatible with the setting in which it is being used. Additionally, the intervention strategies must be governed by a set of values which guides the trainer in knowing what to do and what not to do, how much is too much, when to and when not to, etc.

Effective training, therefore, operates under an umbrella of guiding principles -- a philosophy embraced by the system -- and is dependent on the balance of two perspectives which are often at odds: **Generic Validity** and **Power.**

Generic Validity (or "naturalness") refers to the degree to which a training approach can utilize, approximate or accommodate the teaching strategies used in any given community setting.

Power refers to the amount of intervention, assistance, effort and creativity needed to teach the skills necessary for persons with severe disabilities to successfully participate in community-based, integrated settings. .

These concepts, in their purest form, may be visualized as forces which pull in opposing directions. However, an effective training system must offer **both** options to trainers. The relative degree of Generic Validity or Power to be utilized during training is an individualized decision to be made by the trainer. The rule of thumb for the approach to training suggested here is for the trainer to initiate training which is as Generically Valid as possible, but backed up with sufficient Power to successfully teach the task.

Approaches to training which do not recognize both of these perspectives can result in real problems for learners. If Generic Validity (naturalness) is the sole consideration, employees who need more instructional power to learn tasks than is typically available in the setting might

be underemployed or even excluded from the setting. If the use of instructional power is arbitrarily used from the beginning of employment, it will make it difficult, if not impossible, for natural people in the setting to assume responsibility for teaching and supporting the employee. The outside trainer will become permanently attached to the employee with a disability and to the employer in a dependency relationship. The Seven Phase Sequence resolves these issues in a manner which encourages natural means to be used initially and for increasingly powerful procedures to be implemented as a reserve or back-up in those situations in which individuals need more than the setting is able to provide. It is therefore critical that facilitators be aware of powerful, systematic training procedures in order to provide ideas and information which will keep employees with disabilities on their jobs.

THE STRUCTURE OF A SYSTEMATIC TRAINING SYSTEM

Simple structures are often best, therefore the system of instruction suggested here can be described by this brief outline:

1. Values and Philosophy
2. A System for Organizing the Information to be used in Training
3. Strategies for Training the Organized Information

The basis of this book traces its roots to the work of Marc Gold and the body of research and practical application which he called Try Another Way. The history and evolved relationships with Dr. Gold=s work are described in the author=s notes at the beginning of this text. The **values** associated with the strategies described here are detailed in the opening chapters of this book, in Gold=s (1980) manual on the Try Another Way Approach and in a companion text, Getting Employed, Staying Employed (McLoughlin, Garner & Callahan, 1987).

Since its inception, TAW has been a value-driven approach to training. Every strategy used in teaching must be compatible with an understanding of the rights, humanity and dignity of the person being taught. **Any** discrepancy between values and strategies is **always** decided in favor of values. This provides the protection and oversight which is so necessary, but often missing, in human services' rush to accomplish its goals. It is seen as the facilitator=s responsibility to help resolve any job related issue from a value perspective.

The concepts of **Method**, **Content**, and **Types of Job Tasks** are used to provide the system for organizing the information to be trained. This chapter focuses on these concepts which help the facilitator visualize, categorize and capture in writing all the components necessary for successful participation in the work setting.

Strategies for Training, covered in the following chapter, provide the trainer with effective tools for communicating the organized information to the employee with a disability when natural means are not sufficient. All the strategies which we recommend are compatible with the values referenced above and with the Seven Phase Sequence.

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STRATEGIES FOR ORGANIZING INFORMATION

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METHOD

All work places are comprised of a multitude of job tasks which, taken as a whole, describe the type of business activity performed in that organization. These job tasks also describe and distinguish the roles of the various employees of the setting. Because the survival of a business organization often depends upon the manner in which job tasks are performed, companies typically prefer, even mandate, that job tasks be carried out in a consistent, prescribed manner.

Traditionally, the rehabilitation field has seen the individual, rather than the natural features of the setting, as the starting point for consideration as to the way which job tasks should be performed (Gold, 1980). This tendency was undoubtedly strengthened by the Americans with Disabilities Act, the ADA, (1990) which requires employers to offer reasonable accommodation on job tasks to employees with disabilities. The authors of this text are not in disagreement with the ADA and reasonable accommodation. However, if the Seven Phase Sequence is followed, natural ways of performing tasks are considered and attempted before changes are made, except in circumstances in which the need for a change is overwhelmingly evident in advance. The natural ways which job tasks are typically performed on job sites provide a logical starting point for employees with disabilities to begin their jobs.

From a systematic training perspective, **method** is the concept which addresses issues relating to the way tasks are to be performed. Method involves two issues critical to effective training:

a) Method is the way in which a task/routine in typically performed in a natural setting.

b) It is also the trainer's conceptual standard of "correctness". Method is the mental picture a trainer carries of the task to which the performance of the learner is compared.

The best way to determine the methods to be used for teaching on a job is to **observe** the way employees typically perform the tasks of concern. In some settings there will be a number of different methods which will be used. In other companies, tasks will be performed with tightly-managed consistency, with close attention to the smallest details of performance. Close observation by the facilitator during the job analysis activity and, later, during employee support, enables the picture of correct performance to be imprinted for use as a standard. If during Phase 4 of the Seven Phase Sequence, it is determined that the natural method of the task presents an insurmountable problem for the employee, the method can be either modified or changed completely.

The Importance of Method

Since the method of a task will be the standard of performance which the natural people of a setting, or the facilitator as appropriate, will gauge the performance of the employee, it stands as a fundamentally important concept. A common mistake which most trainers in natural settings make is that the outcome or product of a task is viewed as the standard for correct performance. For instance, if a restaurant manager is teaching a bus-person to clean tables, the manager is often more interested in whether a table is clean than in how the table was cleaned. The attention in this case is on the outcome rather than on the process. This Acut to the chase@ approach to teaching is indeed efficient, but it often creates problems for employees with disabilities who may require a significant number of correct performances of the task in order to truly learn the task.

Therefore method is a systematic training concept, which can be imported into natural settings, that can provide a focus for all of the component steps of a job task. Since methods occur in real time, they can be rather elusive to capture. The best way to Acapture@ the method of a job task is to think of your brain as a video tape upon which the video camera of your eyes will imprint a Amovie@ of the task. Of course, since your brain is not video tape, it often requires a significant amount of observation to get a clear picture which can be replayed by the facilitator, paused and fast-forwarded throughout the method. Once this has been accomplished, the method becomes a resource for a job trainer, natural or otherwise, to instantly assess the performance of the employee.

Without the concept of method, the manner in which an employee performs a task might vary each time. This variance will likely create a number of problems:

a. The task will take longer to learn for most persons (Gold, 197__).

b. It will take the employee longer to perform the task.

c. It is likely that the task will be performed differently than the natural method.

d. It will be more difficult to solve any problems related to performance.

e. The variation might cause the employer to focus solely on the outcome of performance. This is not favorable to persons who can learn to perform correctly if consistency is assured.

It has been the experience of the authors that many natural people in employment settings perform their job tasks in a consistent manner but that they do not seem to realize that they are doing so. In other words, they do not see the critical importance of their own actions, especially in relation to teaching others how to perform job tasks. The need for consistency is a concept which human service facilitators can bring to natural work settings through the Seven Phase Sequence. It must start with the facilitator, usually during job analysis, getting an accurate picture of the methods of each of the job tasks to be performed by the employee with a disability. If the facilitator does not have a clear picture of the method, it will be impossible to identify problems related to method when the employee begins work.

Modifying the Method

If it becomes necessary to change the method of a job task, the first consideration should be to modify the method in a manner which changes the natural procedures as little as possible. For example, an employee in an envelope factory was having difficulty maintaining the count as she fabricated a stack of twenty boxes before moving to another stack of twenty. Visual height cues placed on the finished goods pallet were suggested by the facilitator as an indicator for twenty boxes. This did not provide sufficient information for the employee.   A punch counter, strapped to the leg of the box machine, provided the employee with the consistency needed by the company for this job. A step was added into the method which required the employee to punch the counter after each box was built. She then changed stacks when the counter indicated 20, 40, 60, etc. This modification only changed one step of the method and therefore, represented an ideal initial strategy.

Occasionally, it will be necessary to completely change the method, if it is shown that the employee is not capable of performing even a modified version of the natural method.

Experienced employers and facilitators can often conceive completely different ways to perform a task. The search for alternate methods is a knack which can be developed by considering that many routine tasks have a variety of alternative methods. For example, there are a number of methods to wash a car. One method is to drive the car to an automatic car-wash and enter the tracks provided for the car. Another method is to go to a self-service car wash, get out and wash the car with the spray wand. Still another way is to get a hose, sponge, soap and bucket and wash the car by hand. Also, within each of these methods there are alternative methods which might be used.

An example of how a method can be completely changed on/ a job task for an employee with a disability occurred in Santa Monica, California, when an employer became concerned that an usher with cerebral palsy would not be able to keep up with ticket collections for summer blockbuster movies. The natural method called for the usher to accept tickets from customers, tear the tickets in half, return the stubs to the customers and place the remaining stubs through a slot in a receptacle box next to the usher=s station. Due to the employee=s cerebral palsy, the speed of the task was slower than needed for large summer crowds. The employer modified the

method of the task by placing a placard on the ticket receptacle box which read ΑPlease rip ticket at perforation and drop into slot@. The change required customers to tear their own tickets and to place the stubs into the receptacle box. This change in resulted the speed necessary to allow customers to get through the line quickly while maintaining the need for security. The employee actually had more time to observe and interact with the customers.

When method changes are necessary, the Seven Phase Sequence encourages facilitators to welcome employers into the effort to find solutions. This will require a behavior change for many facilitators who have traditionally rushed to offer various solutions so that employers would not be bothered. However, we have learned that this approach creates dependency and allows employers to avoid assuming ownership of the impact of an employee=s disability. The Seven Phase Sequence asks facilitators to consider ways to encourage employers to deal with the issues raised by the disabilities of their employees while, at the same time, providing back-up and additional ideas when the employer=s suggestions are not effective.

Two important factors to consider when modifying a method are: (a) to change the typically-used, **natural** method the least amount possible; and, at the same time (b) meet the **needs of the employee** learning the task. Ideally, the job developer has also identified job tasks with natural methods which can be performed by the learner.

Phrases which can be used instead of Method

When negotiating and discussing issues in natural work places, facilitators should avoid using jargon words associated with human service strategies. The best approach is to listen carefully during job analysis to the language used in the setting and try to find substitute words whenever possible, rather than those used here. However, it is likely that many settings will not typically use any words which convey the meaning of a concept like method. In that case, it is suggested that you might try: ΑThe way you usually do the task@, ΑThe procedure which you use@, or, ΑShow me each part of the process@, as a substitute for the word, method.

CONTENT TASK ANALYSIS: A CONCEPT FOR MANAGING METHOD

Content task analysis, breaking the method of a task into teachable component steps has been a strategy available to trainers in business and in the human service field for years (Gold,

197__; get other references). In fact, content task analysis was traditionally viewed as the foundation or the starting point for any effective training. This focus led researchers and practitioners to concentrate on the minute aspects of a task and on the writing skills which were necessary to describe ever smaller pieces of the method in a manner which would, hopefully, convey an accurate image of the step. This attention to step-by-step detail was a good match for the motion and time studies required by law in sheltered workshops and work activity centers. Practical researchers such as Gold, (197__; Wehman, 1980; and Bellamy, 197__) suggested that content task analysis was a requisite for any effective training approach.

Because of the popularity of this strategy, content task analysis was considered by many to be an essential ingredient of quality supported employment services. However, as supported employment (SE) expanded in geometric proportions in the late 1980's, human service personnel recognized that most community business did not write content steps or any kind of step-by-step procedures for most of the tasks, that supported employees were performing. This inevitably led to tension between SE managers and researchers, on one hand, and job coaches on the other. Job site supporters have always been reluctant to perform paper work and data collection procedures which do not seem to be required by employers.

The problems associated with content task analysis, therefore, are as apparent as the tensions described above and as subtle as the possible uncomfortableness and artificialness which any sophisticated approach can convey to the everyday people in a work place. Human service job trainers have undoubtedly noticed the lack of fit for years between a detailed content task analysis and the real needs and natural procedures of the work setting. In the early days of employment support for persons with severe disabilities, a Marc Gold & Associates job trainer related the following story:

> The job to be performed at Motorola involved the operation of a complex semi-conductor testing machine. I spent two weeks on the job analysis and also wrote a detailed content task analysis on the operation of the machine. I noticed that when I was trained to perform the task the training supervisor presented about fifteen steps -- verbally, not in writing -- as an explanation of the method of the job. In consideration of our employee

with a disability, I wrote a content task analysis which involved 145 steps, each an accurately described component of the method. When I proudly presented my task analysis to the area supervisor as a tool to be used for further training and trouble shooting for our employee, she had an uncomfortable look on her face as she tried to make positive comments about the Athoroughness@ of the analysis. Suddenly, she brightened and said, AThis is exactly what the engineers have been asking for!@ She immediately called two guys from Design and Engineering who looked at my analysis and exclaimed, AThis is what we=ve been suggesting!@ The supervisor gladly handed the document over to the engineers and asked them to study it a while. My content task analysis was never seen on the work floor again. (Rhodes, personal communication, 1983)

This experience surely represents countless situations in which the best human service intentions did not match with the needs and realities of the natural work setting. We had to question ourselves and the strategies which we had imported from artificial, simulated work settings. Probably no other human service concept created more uncertainty than content task analysis in relation to the needs of persons who find tasks difficult to learn.

A new basis for content writing

The issues described above led the authors and others associated with Marc Gold & Associates to reconsider the role of content task analysis in supported employment facilitation. The Seven Phase Sequence asks facilitators to examine and follow the natural means used by a company to teach employees the natural ways of the setting. Therefore, in a business like Wendy=s Hamburgers, in some franchises, the facilitator would encourage the use of the picture/task cards available to all employees in order to organize the information for teaching the job of Apreparing and frying chicken fillets@. However, experience has shown that many companies do not write step-by-step procedures for discrete job tasks. In those situations, facilitators are advised to write a content task analysis on the steps of method **from the perspective of a typical employee of the setting.** This strategy is suggested for several reasons:

1. The reference point remains naturally-focused, in keeping with the Seven Phase Sequence.

2. Supervisors and other Anatural people@ will recognize the utility of the analysis because of the similarity to their perspectives.

3. It remains a good idea to write down the steps of the method for accountability, professional responsibility and sharing.

4. Job tasks can always be broken down further in Phase 6 of the Seven Phase Sequence to meet the needs of employees who may need smaller steps in order to learn their jobs.

5. By waiting until Phase 6, facilitators avoid the need to break all steps down to smaller components. It is possible to focus only on those steps which are causing problems for the supported employee.

The Relationship of Content Task Analysis to Method

Content is simply the arbitrary number of steps into which a method is divided. It serves as a means to stop and capture the method much in the same way a movie poster stops and captures a scene in a film. Perhaps an even more accurate analogy is that content steps are like the frames one sees when 16 mm projection film is held in front of a light source. What will later become real-time motion, when a projector light and motor interact with the film, is actually a lengthy series of frames much like small slides. Each frame has stopped the motion of the film and each frame, conceivably be described as a Acontent step@ of the movie. Of course this would involve thousands of descriptions that would be distinguished one from the other with the most subtle changes. This would represent, possibly, the most detailed content task analysis one could imagine.

If the film described above was taken of a job task, rather than a movie concept, it would represent the method of the task, when run on a projector. Rather than taking each frame as a step, a facilitator would start with the first frame, sequentially, and include all the frames which represent the first grouping of common actions. These frames taken together would become step

#1 of the content task analysis. The consideration given to the amount of action to be contained in any given content step is:

    a)   The amount of information which can be utilized by a typical employee in the setting, and,

    b)   Whenever the action of the task changes (Such as the difference between stuffing an envelope with a bill and sealing the envelope).

Method and content work together and in virtually all cases, sequentially. Even though both concepts are important in the organization of the information to be trained, facilitators must realize the role that each plays. Method relates to the real time during which the task is being performed. It is used as a standard by which a trainer can determine correctness. Content is a strategy for managing the method. It stops the method and allows trainers to:

1.   Give discrete information for achieving correct performance and consider alternative informing strategies for all the different steps of the method;

2.   Break the task into smaller, more teachable steps, as required by the needs of various employees; and,

3.   Collect data on the method in a way that would not be possible without a content task analysis.

Writing Content Steps

Perhaps no aspect of training has created more tension and misunderstanding among job facilitators than the requirement to write detailed content task analyses on every job performed by supported employees. Marc Gold (1980) was merely one among many researchers and academics who strongly encouraged job trainers to write individualized, detailed task analyses for employees with disabilities on community jobs. One of the reasons for this attention was that traditionally it was felt that the correctness of each step (see the following discussion in this chapter) was communicated and understood in the accurate writen discription of content steps. This perspective led to an inordinate amount of focus on the writing and analytic skills of job trainers rather than on their teaching and communication skills. Systematic training often

became the domain of articulate and educated staff rather than an interaction between a person with information and another who needed that information.

As real business conditions began to influence human service strategies, method emerged as the more natural and comfortable concept to carry correctness. Since method is an image, rather than a product of one=s writing skills, regular people can be invited to use systematic instructional procedures. This shift also meant that the writing of content steps had to be reconsidered.

We continue to suggest that facilitators write not only a general job analysis (see Chapter ___, page ___), but also that a content task analysis be written for each of the most critical tasks of the job. The difference now is that we suggest that, initially, tasks be broken into only as many steps as needed by an average employee of the setting. This change results in a Aleast amount@ of effort and allows facilitators to target only the most critical tasks for writing. If individual employees need smaller amounts of information than is available in natural steps, the problem steps can be easily broken down on a data sheet (see Data Collection, page ___). This approach to writing content steps will allow facilitators to share their task analyses with the employer and other natural people in the setting in a way which will connect the supported employee with the natural means useful for all employees.

Strategies for writing content steps vary among facilitators and the business in which they support employees with disabilities. If a company already has written step-by-step procedures for the job(s) to be performed, it is not necessary to write additional content steps unless the supported employee experiences difficulty and needs smaller pieces of information in order to learn the task. If the particular job does not have written procedures, try to model your content steps after the company=s style. In cases in which no written procedures naturally exist on any of the tasks to be performed, facilitators are encouraged to write steps in a clear, complete style, using language derived from the setting whenever possible. A well written content step has a number of components. (Sample content task analyses are provide later in this chapter) Example:

4. Insert the toner packet into the receptacle until it stops, even with the front of the receptacle, and rotate the toner packet 180° to release toner.@

Method and Content Considerations

There are a number of concepts related to the organization of training information using method and content. The first consideration is that of **correctness** and its Aflip side@ issue of **error.** Correctness occurs when an employee performs the steps of the method in a manner that the completed task is acceptable to the employer. Note that this definition does not address how the task is performed, merely that the result is acceptable. This general view of correctness is common in many natural work places. However, systematic instruction procedures demand a more in-depth look into an employee=s performance and requires that distinctions be made between at least two categories of correctness: Topographical Correctness and Functional Correctness (Ford, 198__; Callahan, 1993)

Topographical Correctness occurs when the steps of the method are performed in the way they are typically performed in the natural setting, as taught by the trainer, so that the task is completed with acceptable quality.

Functional Correctness occurs when a task is completed with acceptable quality, but in a manner different from the method typically performed in the setting.

The degree to which an employee must adhere to topographical correctness or be allowed to use functional correctness is dependent on a number of factors, the most important of which relates to the a balance between the demands of the work setting and the needs of the employee. For instance, if a facilitator finds that a particular hotel wants its sheets folded so that the small hem around the edges is always folded inward with the edges lining exactly even, the facilitator must assure that the employee understands this and folds the sheets in the correct manner. If the employee is unable to perform this step correctly with adequate training, it is usually best to negotiate another task which can be learned. Other factors which influence the need for topographical correctness are:

1.   When safety issues are a concern such as in hand placement on a press machine. Functional correctness may inadvertently lead to an accident as the employee=s hands are placed in various locations on the machine.

2.   When the productivity of the task is critically important. Often the topographically correct method is also the most efficient method.

3.   When the person teaching the task also performs the task using the same method. This will increase the comfortableness of natural people to teach supported employees.

4.   When teaching the task(s) which will be performed the most frequently during the work day. It just makes good sense not to encourage flexibility on the tasks which are performed the most often. Any problem related to functional correctness will be heightened.

Functional Correctness is appropriate in a number of situations on the job. Facilitators must be careful**,** however, not to consider functional correctness as a starting point for teaching. When this happens, employees often take much longer to learn their jobs and the quality of performance and safety considerations become problematic. Facilitators might consider allowing functional correctness in the following circumstances:

1.   On tasks which are inherently performed based on individual choice, such as the way one hangs coats and other personal items in a company locker.

2.   On tasks which are performed only occasionally during the work day or week. The manner in which a task is performed is usually less important as the number of times it is performed decreases, unless there are safety or quality concerns.

3.   On tasks which an aspect of the employee=s disability hinders the performance of topographical correctness, such as the difficulty an employee with cerebral palsy may have operating a copy machine. Significant modifications to topographical correctness may needed to the method to accommodate the employee=s disability.

An **error** in performance occurs whenever the employee does not perform the steps of the method topographically or functionally correct and assistance is needed from the trainer for

correctness. A facilitator determines error by comparing the performance of the employee to the mental image of the method gained in job analysis. This view of error does not in any way imply that it is a negative concept. All employees will make errors during the acquisition of a task and even later, during performance. The important distinction that this approach to training makes is that trainers and facilitators are encouraged to focus on the correction of errors made during the performance of the method, rather than simply on the outcome or product of the job task. In this way, employees with disabilities can learn to perform their job tasks in ways which are as similar as possible to the typical methods used in the setting. This should enhance acceptance and comfortableness on the part of supervisors and co-workers of the supported employee.

Facilitators need to determine when an employee has learned the job tasks which have been assigned by the employer. **Criterion** is the point in training at which the trainer feels that acquisition of the job task has taken place (Gold, 1980). Facilitators will discover that few natural work settings actually have a concept similar to criterion. However, it is critical for facilitators to identify the point at which criterion performance is assumed. Since there is not likely be a natural standard for criterion, facilitators will usually need to set criterion in a way that makes sense in relation to the demands of the job tasks and the work setting. It must be remembered that no task will be performed correctly 100% of the time, day after day. Facilitators must therefore set criterion as a reasonable percentage of perfect performance. The better a facilitator knows the work setting, the easier it will be to set a fair and effective criterion for job tasks.

Regardless of the number of cycles of performance which the facilitator chooses for criterion, it is necessary for the employee to perform all the steps of the method, topographically correct (or functionally, as appropriate) without assistance from natural trainers or the facilitator. This sets a high standard whether the target number for criterion is Athree of four cycles@ of the task or A48 of 50 cycles@.

A close cousin to criterion is **Cycle Constancy,** the topographically correct performance of all the steps of the task, cycle after cycle (Gold, 1980). This concept, borrowed from industrial time and motion technology, addresses a characteristic of tasks which have naturally

repeating cycles (see Core Routines, page ___ of this chapter). Gold and other researcher found that when a task is performed in a consistent manner, each time it naturally occurs, the time necessary for criterion performance is lessened. In other words, cycle constancy offers Anatural training power@ on those tasks with naturally repeating cycles. This helps explain the observation noted by many job trainers that the basic job responsibilities are seldom problematic for employees with disabilities. It is most often episodic tasks and duties which create problems on the job.

The need for attention to criterion and cycle constancy often operates together. Facilitators should set criterion high and closely monitor topographical correctness and cycle constancy when:

- Safety is a concern
- Quality is an issue
- Productivity demands are high
- The task is a Core Work Routine
- When the cycle is short
- When the cost of material and/or errors is high

Criterion can be lower and functional correctness is appropriate when:

- Safety is not an issue
- Training tasks which have a variety of acceptable methods
- The task is an episodic or job-related

Content Steps

The content steps of job tasks vary in a number of important aspects. The following descriptions relate to various types of content steps. It should be noted that a given step might share a number of these characteristics. One distinction among the types of steps relates to the specificity of information contained within the step:

Discrete Steps are steps of a task which involve distinct or absolute action. Correct action can be specified and and easily evaluated. All other action is incorrect. An example of a discrete step would be Ato enter the price of a product in a cash register@. These steps are usually more easily taught than steps requiring judgement.

Judgement Steps, on the other hand, are steps which involve a range of correctness -- soft boundaries. The evaluation of correctness therefore, is often subjective. An example of a judgement step would be Acleaning a table in an up-scale restaurant.@ Judgement steps require **consistent practice** in order to be learned.

Another perspective deals with the amount of information contained within a step and the impact on teaching and learning:

Natural Steps are steps which contain the amount of information typically needed by an average employee of a work setting to learn the task. The facilitator often has to guess or estimate the amount of information in natural steps if no such determination has been made in the setting.

Teachable Steps are steps which contain an amount of information suitably matched to the needs of the learner. Content steps can be continually broken-down in Phase 6 of the Seven Phase Sequence to arrive at the ideal match for a given learner. Natural steps may or may not be teachable in their initially written form, depending upon the needs of the employee.

A final distinction among steps involves the type of action required of the employee. Most natural steps of performance tasks can be divided into order, discrimination and manipulation components which may later be further broken down into teachable steps:

Order Steps are steps which occur at the beginning of each new action change in the task. These steps relate to the sequence of the method.

Discrimination Steps require the employee to distinguish the proper feature or cue of the task for correct performance.

Manipulation Steps involve physical interaction by the employee with a component of the task in order to achieve correctness.

An example of each of these components occurs in the natural job task step ATurn on the computer@. In this step there are actually three smaller, more teachable steps: a) the order

component of turning the computer on rather than inserting a disk; b) the discrimination step of recognizing the on/off switch and its current position; and, c) the manipulation step of physically switching the computer to the ∧on@ position. These steps are useful in Phase 6, when breaking a natural step into more teachable steps and, later, in training strategies, when considering the types of assists which may be effective in teaching the steps (see page ___).

Additional Content Considerations

T   It is more important for the trainer to "see" or conceptualize the components (steps) of a task than it is to write each step in detail.

T   It is suggested that the trainer write out the steps of tasks which are important and which are expected to be difficult to train. This writing can be informal and the steps should reflect the needs of an average person.

T   Content steps serve to remind the trainer of the method rather than accurately describe the method.

T   Written Content Steps are not clear enough to communicate complex task performance. If there are to be multiple trainers for a task, each trainer must ∧see@ the same method in order to teach effectively.

Natural Cues and Consequences

Natural cues are the existing features of any setting, task or item which assist people to correctly perform the tasks or jobs of the setting. Some settings, such as airports and markets, provide a great deal of information in the form of signage. Others setting, like parks, have many fewer cues for visitors to use for correctness. Visitors may simply have to infer that the presence of swings and slides comprise a playground. In other settings, a bank may use railings and signs to indicate the correct procedure for waiting for a teller. Some stores use large flashing signs to show that they are open. Large malls often provide an information booth for their customers.

In work settings, natural cues are important to trainers because they can be utilized to enhance the acquisition and maintenance of difficult to teach episodic and job related routines. All job tasks, even core routines, contain natural cues, but their use is much more critical on tasks with significant time delay between cycles of performance.

Virtually every component of a natural routine has a number of natural cues which can be referenced by the trainer to help teach and maintain the skill. It is critical that the trainer identify the most relevant or Asalient@ (Ford & Miranda, 1984) natural cues and observe how the employee attends to those cues.

Natural Consequences:

When a person performing a particular task fails to observe a natural cue, one of several things might occur: (a) The routine may be interrupted, or perhaps terminated. This can be referred to as a **neutral** natural consequence; (b) The person may become injured, embarassed or frightned. This can be considered a **negative** natural consequence; or, (c) The person may receive assistance or additional information. This natural consequence can be thought of as **assisting**. It is the responsibility of the trainer to insure that the likelihood of consequence (a) occuring is slight, consequence (b) occurring is non-existent and that consequence (c) be used in teaching the targeted task. Additional perspective on natural consequences for teaching will be discussed in the following chapter on training strategies.

Natural cues and consequences should be identified by the trainer during the development of the inventory and utilized, as appropriate, during training.

Types of Job Tasks

Even though the concepts of method and content comprise the basis for organizing information for training on job sites, distinctions among the types of jobs to be performed provide additional perspective for facilitators to consider before beginning instruction. This section will present the training issues associated with three types of job tasks and an additional overall category which addresses the culture of the work place.

Core Routines are job tasks which have cycles which are repeating, without significant interruption between cycles. These tasks are typically those most frequently performed by the employee. The cycle of a task begins with the first step of a job sequence and ends with the step which precedes the initial step of the next sequence.

Examples: Office   Data entry

Operating a copy machine

<div align="right">Collating forms</div>

Grocery   Stocking shelves

<div align="right">Bagging groceries</div>

Factory   Operating an injection molder

<div align="right">Assembling electrical components</div>

The importance of core routines lies in the natural instructional power available from the repeating cycles. Consistent cycles provide the facilitator with the opportunity to fine tune the employee=s correctness simply by taking advantage of the opportunities for giving information each time the cycle is performed. Additionally, Gold (   ) found that the practice effect available by correctly performing core routines in their natural cycles proved to significantly reduce the time to criterion for persons with severe intellectual disabilities. For most core routines, the facilitator will choose to directly provide observe the training of the employee and to be immediately available for assistance.

The following is a sample content task analysis for a core work routine for a task in a restaurant:

Dishwasher Operation

1. Place rack on rinse table
2. Load rack - large pans in rear, plates in front
3. Rinse dishes with spray nozzle
4. Check for stuck-on food, re-rinse if necessary
5. Make sure dishwasher is not running
6. Raise door on dishwasher
7. Slide rack into dishwasher, pushing clean rack out the other side
8. Close door of dishwasher to begin wash cycle
9. Move to sort table
10. Remove similar items from rack and stack on table
11. Place stacked items on appropriate shelves
12. Continue #s 10 & 11 until all items are shelved

13.   Return rack to rinse table

Episodic Work Routines are assigned job tasks which have cycles which occur infrequently; once or twice a shift, or possibly even once a week, and are required by the employer as part of the job description. These routines are often more difficult to train because of the time lapse between the cycles.

Examples:	Restaurant	Cleaning the dishwasher at the end of the shift
		Taking out the garbage to the dumpster
	Grocery	Punching a time clock
		Assisting a coworker to unload a truck
	Factory	Filling out production forms
		Getting supplies for work station

Because episodic work routines lack the natural training power available from core routines= repeating cycles, facilitators need to find other sources for additional instructional power as training problems arise. There are a number of strategies a facilitator can use to regain the difficulty created due to the time delay between job cycles:

1.   Reference natural cues and use assisting natural consequences.

2.   Pull the problem step out of the natural cycle, or the task out of the natural flow of performance, and practice using repeating cycles.

3.   Negotiate assistance from others in the work setting for difficult components of the task.

For information on natural cues and consequences, see the discussion earlier in this chapter. By referencing and utilizing natural cues and assisting natural consequences, facilitators can gain instructional power not available due to the time delay between cycles of performance of job tasks. However, this focus alone may not be sufficient to teach tasks with significant time delay. In that case the trainer needs to use a decision strategy (Ford & Miranda, 1984) similar to the one suggested in the following chapter on training strategies. If these approaches do not prove sufficient to teach the task, facilitators may need to negotiate for partial assistance (Brown,) from cow-workers or supervisors in order to complete the problem step(s) of a task.

The following is a sample content task analysis for an episodic work routine for cleaning up a work area in a restaurant:

1. Stop dishwashing duties at 10 minutes before end of shift.

2. Stack and store all clean items from stack table.

3. Place all remaining dirty dishes in rinse sink.

4. Place all racks on shelf below rinse table.

5. Locate cleaning bucket, cloth and cleaning solution.

6. Fill cleaning bucket with warm water.

7. Spray cleaning solution on rinse table.

8. Wipe table with damp cloth until clean.

9. Repeat steps 7 & 8, cleaning the dishwasher and the stacking table.

10. Empty cleaning bucket, rinse cloth and return cleaning items to storage cabinet.

Job-related Routines

Skills/routines which are not part of the job but which are vital to successful performance. These routines are too often ignored by job-site trainers. They share many characteristics of Episodic Work Routines in that significant time delay often occur between cycles of performance. Examples of job related routines might be Agetting to work@, Agoing to the bathroom@, Ataking a break@, or Aknowing when to stop work@. Job related routines involve skill and routines which are not explicitly required by the employer for the job, but which are vital for successful performance of the job. These routines may occur either on-site or off-the-job, and are often ignored by job-site trainers. Additionally, poor performance of these routines is more likely to occur than on core work routines. Many workers with disabilities lose their jobs when assistance is not offered to facilitate acceptable performance.

Examples: Restaurant   Getting ready to work

Washing hands after taking out garbage

Grocery   Taking the bus to work

Setting up one's lunch at work

Factory — Using the soda machine in the worker's break area

Getting back from break on time

The following is a content task analysis for Getting Ready to work in a Pizza Hut:

Inventory for Getting Ready to Work

1. Get off bus in front of restaurant.

2. Walk to employees entrance.

3. Enter door into foyer.

4. Walk through kitchen area to employee's lounge.

5. Locate and open personal locker.

6. Take off coat and other items.

7. Place all personal items in locker.

8. Take apron from locker and put on.

9. Close and lock locker.

10. Go to Lavatory: wash hands, comb hair, check clothes.

11. Go to time clock to punch in to begin work day.

Accommodating to the Culture of the Setting This area deals with the "culture" of the work place: How much flexibility is allowed?, Can employees sit down on the job?, Is there a dress code?, How are outbursts dealt with by the supervisor?, Are there unwritten rules?

It is critical to understand and communicate to the supported employee the expectations an employer has for the employees and the degree of flexibility which is allowed in a work place. Facilitators often make the assumption that all employers have the same expectations and will allow only a certain degree of difference in their companies. The fact is however, that work sites differ widely in the ways in which they consider employee behavior. In some work settings it is fine to sit when a worker has completed a certain amount of work, in others the worker may be fired for sitting. Some employers expect workers to deal with personal differences away from work while others tolerate occasional spats among workers. The job analysis provides facilitators with the time for exploring and clarifying the culture of work settings. This Acultural analysis@ is possibly the most compeling reason to spend time in work places prior to the initial

day of employment for the supported employee. Work cultures are often subtle and complex. Job analysis provides an opportunity to observe work cultures without the distraction of job facilitation required after an employee=s first day of work. Of course, a cultural analysis is not completed during the job analysis visits. Facilitators must be constantly receptive to the information which unfolds during the employee=s time on the job.

It is in this category, particularly, that effective job matches are made. Examples of problems associated with accomodations to the culture of a work setting might include:

Restaurant	Drooling while serving customers.
	Talking to customers while bussing tables.
Grocery	Touching customers walking by in the aisle.
	Opening and eating a box of cookies while stocking

shelves.

Factory	Wearing open-toed shoes to work.
	Calling your supervisor by her first name.

Facilitators will often treat cultural issues such as these as tasks to be learned, similar to episodic and job related routines. In those cases it is necessary to get a clear Apicture@ of the appropriate natural method of performance and to then consider a content task analysis based on that method. In situations in which it is not feasible to teach appropriate cultural behavior, it may be necessary to more closely consider the match of the company=s culture to the needs of the employee. For instance, a man who came from a family culture which did not emphasize the importance of daily bathing was employed in a restaurant as a dishwasher. He wanted to be a dishwasher, but he was not able to deal with the restaruant=s need for personal hygiene. After months of intrusive assistance involving supports around bathing, a new job was developed with a friend of the family who is a house painter. The man was excited because he loved to paint. The match was also an effective way to deal with the problem with the issues raised by the cultural incompatibility in the restaurant since the culture of the painting job did not have personal hygiene as a value.

DATA COLLECTION IN INTEGRATED WORK SETTINGS

Data collection procedures of training interactions have traditionally be used to offer insight into several areas:

1. To make training decisions
2. To indicate how training/learning is progressing
3. To indicate when criterion has taken place
4. For accountability
5. For motivation for both trainer and employee
6. To know how production rates are proceeding (especially important when established rates or learning curves are mandated)

The amount of data collected on supported employment jobs is a major factor affecting the satisfaction of human service facilitators (Agosta, 1994). Traditional job coaches have complained that there is an overload of paperwork required for every aspect of supported employment. This has resulted in a de-emphasis of data collection on the acquisition of tasks performed by the employee. With all the surveys on satisfaction, demographics, wages, support hours, etc., it should not be surprising to learn that facilitators have become cynical about data collection. However, we feel that facilitators avoid data collection of training interactions at their own peril. It is, therefore, necessary to re-examine the traditional reasons to collect data in light of the changes which are occurring in supporting employees on supported employment jobs.

Trainers have traditionally been encouraged to take acquisition data to make training decisions and to know how training is progressing (Gold, 1980). However, as thousands of persons with severe disabilities have had job opportunities in real work settings, it now seems that these two reasons relate more to research needs than to actual training needs. Most trainers simply do not turn to their data sheets for information on making decisions or to let them know what is happening. If they have learned the method of the job tasks to be taught and are available to the employee during the performance of the job, the status of training is evident without consulting a data sheet.

Does this mean that data collection of acquisition data is no longer needed? We think not.

In fact in some ways data collection is more important than ever. With declining resources and increased scrutiny of the rehabilitation field, data on task acquisition can represent our role in facilitating successful performance of supported employees. Additionally, there has never been a clear societal mandate from communities and employers to assist persons with severe disabilities to find real jobs. We are, therefore, vulnerable to the issues created by inadequate teaching and support of supported employees. The collection of acquistion data to the point of criterion performance can provide a strong case that facilitators have done their jobs to assure the safest and highest quality conditions for persons with disabilities.

We now suggest that accountability is the number one reason to document the performance of supported employees. By tracing the progress of learning from the initial days of employment through criterion performance, facilitators have powerful data to verify that tasks were learned, to offer encouragement to supported employees, to impress supervisors and company owners and to meet most of the needs of human service agencies and their funding sources. This type of data also provides facilitators with a valuable customer service tool. Supported empioyees and their families can see the progress made duing training and the point at which criterion was assumed. All of these outcomes are available from a concept which is performed basically to protect and verify the performance of the facilitator.

Types of Data Collection

Data Collection strategies need to be tailored to meet the reasons for collecting the information in the first place. The primary reasons for collecting data during the acquisition phase of training are to verify criterion performance and to account for the training which was provided. If a provider agency is part of a research effort, there may be additional reasons for data collection. There are two basic forms of data which will address these primary reasons -- coded data which references the steps of the task and narrative data which describes the performance and outcomes.

Coded data collection strategies

When a facilitator has completed the job analysis, the step-by-step procedures which describe the method of the job tasks are written, with the needs of a typical employee in mind. These steps also provide the framework for a data sheet which the facilitator can code with various indicators of performance and/or assistance. The exact steps of the content task analysis will become the steps of the data sheet. In this manner the facilitator can trace the performance of the supported employee from a perspective which is as natural, and as brief, as possible. The first decision to make when using a coded data sheet concerns the codes which will be used to describe the actions which are observed.

Traditionally, human service data collection procedures have been taken on tasks which were broken into the smallest possible pieces of performance and involved coding systems which seemed to focus on every aspect of employee action except correctness. Data codes have typically referenced the assists which were provided by the trainer, the type of error made by the learner and the degrees of correctness of the learner=s performance. Often, codes referenced five, six or more different considerations for error or assistance, but only one code for correctness. One might wonder if trainers really thought that the task would be learned by the employee. There are a number of subtle problems associated with traditional, research-based data collection procedures on supported employment jobs:

1.   A focus on trainer assists and employee errors shifts the attention away from the real goal of instruction -- criterion performance by the employee.

2.   When numerous data codes are used, the facilitator must mark every step of the data sheet in order to get an accurate picture. If a simplified, two code strategy is used, the facilitator need only mark one code at any time. In this way the facilitator can choose to mark the code which is occurring the least.

3.   It is virtually impossible to keep step-by-step data, while teaching, when the data sheet describes a minutely written content task analysis and when using multiple data codes.

4.　　No single instance of data is particulary important or even accurate. Facilitators may miss or misintrepret employee action. Criterion comes from consistent performance over trials.

It is recommended that data collection using coded data sheets be simplified in a way to avoid these problems. First, facilitators should focus on teaching the task to criterion, rather than on the assist required or the errors of the employee. Secondly, the use of a two code data system will simplify data collection and allow the facilitator to make decisions regarding which code is likely to be needed the least. The codes to be used should reference: a) Topographically correct performance of the steps of the method, without assistance from the trainer (most facilitators use a plus or a check mark for this code); or, b) Anything other than >a= (most use a minus for this code). Item >b= includes employee errors, functional correctness, trainer assistance of any sort or performance of the step(s) by the trainer. This approach sets a high standard for teaching and employee performance. Third, we recommend that facilitators implement a consistent strategy for data collection which does not require step-by-step marking of data codes on every cycle of task performance. This can be accomplished by using either a consistent recall strategy or a data probe. Finally, criterion performance, not individual data points, is the real payoff. Data collection procedures should focus more on establishing criterion than providing minute information of errors and assists.

Recall strategy

When using this strategy, the facilitator begins by estimating a period of time which can be remembered for accurate recall of employee performance. Typically, the shorter the cycle of the task, the shorter the interval between data collections, and visa versa. Training is provided by the natural trainer or facilitator, as appropriate. Begin the observation by focusing on steps performed topographically correct, without assistance from the trainer. Note the time, stop performance briefly and mark any pluses which may have occured. It is not necessary to be completely accurate, although care should be taken to reflect the performance as carefully as possible. Resume training, again focusing on correctness. The initial interval for recall should

typically be no longer than about fifteen minutes. As performance improves two changes can occur: a) the focus should shift to marking errors or assists, as they are occuring less often than correct action; and, b) the interval for recall can increase to thirty minutes or more.

Data probe

A data probe is similar to the recall strategy in that it frees the facilitator from collecting data on every cycle of a task. The difference is that the facilitator decides to focus on a given cycle in a consitent time interval. Rather than recalling performance, one cycle represents all the other cycles performed during the interval. If the facilitator is directly providing instruction to the supported employee, it is suggested that at the end of the probe cycle, the employee is asked to wait a moment while the data sheet is filled out. If a natural trainer is teaching, the facilitator is free to follow each step as the action occurs. The time intervals selection should follow the same suggestions as for the recall strategy. The important thing to consider for either approach is that consistency is the key. Since these options allow facilitators additional time to focus on teaching, it is critical that the time intervals be remembered for data collection. It is also important to take a moment and chart the number of cycles performed during the interval. If facilitators do this, they can use simple division to indicate the employee=s production rate all during acquisition. **Important note:** It is rarely necessary to use either a recall or data probe strategy for episodic or job-related tasks, due the the singular nature of the job cycles. Facilitators can usually chart the data either during or immediately after the task is performed.

Strategy for Data Collection When Training a Core Routine

1.   Get to know the task to be trained.

2.   Develop a content analysis of the task

3.   Make initial data collection decisions.

-        type of coding system

-        recall or probe strategy

4.   Compile and <u>learn</u> the data sheet for the task.

5.   Start training task, w/o taking data, for 15 minutes; keeping in mind steps/skills done w/o assist.

6.   Stop training momentarily, chart data either from memory or actural performance on the data sheet, the steps done w/o assist.

7.   Repeat steps 5 & 6.

8.   Consider extending the interval to 20-30 minutes; again keeping in mind steps/skills done w/o assist.

9.   Repeat steps 5 & 6.

10.   Consider changing focus to those steps requiring assistance and mark with a minus.

11.   Repeat steps 5, 6, 8 & 10 until the learner reaches criterion.

12.   After criterion begin keeping narrative data on general performance, areas of difficulty and productivity.

Addressing problem steps

During training and data collection, difficult steps of a task may require attention in Phase Six of the Seven Phase Sequence -- Amend/Structure Natural Means. Facilitators will often find it necessary to break a step(s) down into smaller pieces of action. If this is necessary, the data sheet must also be changed to reflect the smaller steps. The following example describes the operation of a press machine in a factory and the break-down of the problem step of removing papers from the press.

Operation of a Press Machine

Original Content Analysis	Modified Content Analysis
1. Assume operating position.	1. Assume operating position.
2. Decide when sufficient papers are in bin -- approximately 50 sheets.	2. Decide when sufficient papers are in bin -- appoximately 50 sheets.
3. Remove papers from bin.	3. Place left hand under papers, palm up.
4. Turn with papers to stacking table.	4. Raise right hand over papers, palm down.
5. Jog papers with Aportrait@ orientation until even across top.	5. Watch for next sheet to exit press.
6. Jog papers with Alandscape@ orientation until even across top.	6. When sheet hits stop, lift stack by moving left and right hands towards each other.
7. Place papers on stack on table.	7. Turn with papers to stacking table.
	8. Jog papers with Aportrait@

9.   orientation until even across top.
   Jog papers with Alandscape@
   orientation until even across top.
10.   Place papers on stack on table.

This example shows the result of breaking step # 3 into four smaller parts. The method of the task is unchanged but the focus is now on smaller pieces of performance. The data sheet used by the facilitator would also need to be adjusted to reflect the smaller steps.

Charting criterion performance

During Production

  Chart:

   - # of units produced by type of unit

   - # of cycles performed by task/routine

   - time per unit/cycle

   - % of assigned work completed

   - # of errors

   - Narrative

CODING SYSTEMS

  - Tasks must be broken down into sequential and teachable steps/skills

  - Codes must refer to specific steps/skills

  - Keep as simple as possible

  - Use already existing systems if possible

  - Should compliment training plan/analyses for purposes of decision making

  - Based on needs of employee and employer

During Acquisition

1. Coding for assists given/not given

   +   =   step/skill performed w/o assist

   -   =   step/skill required assist

   0   =   step/skill performed by trainer or coworker

2. Coding for type of assist given by trainer/coworker

V	=	verbal assist
G	=	gestural/modeling assist
P	=	physical assist
D	=	demonstration by trainer/coworker
+	=	step/skill performed w/o assist
0	=	step/skill performed by trainer/coworker

3. Coding for type of error made by employee

M	=	manipulation error
D	=	discrimination error
O	=	order/sequence error
+F	=	functionally correct response
+	=	topographically and functionally correct response

4. Coding for action performed by employee (particularly useful for discrepancy analyses)

The following is an abbreviated description of what the employee actually did on various steps/skills of the task.

Example:

Step/skill	**Learner action**
7. Raise arm on dishwasher door	7. Grasped arm and pushed down

During Production

1. Reporting forms used by the employer

2. Graphs and charts used by the employer or devised by the trainer

3. Informal records of rate of production and amount of work accomplished by employee, used by trainer