



Chapter 7 Designing an e-Learning System



Learning Objective:

Be able to analyze examples of e-Learning based on elements of e-Learning systems and be able to suggest an improvement for them.

Be able to suggest an improvement by making the most of the advantages of group instruction and e-Learning through blended examples.



Summary of this Chapter

- An e-Learning system includes elements such as a knowledge management system (KMS), a performance support system (PSS), an online community, and group instruction, as well as e-Learning in a narrow sense (online training), and all of these elements need to be designed.
- Combined use of online training and group instruction is referred to as blending, which includes two types, “core-type” and “both-end type.” The situations where the methods of group instruction led by an instructor, and presentations are to be used should be carefully decided, as “remote delivery of presentation” can be made possible.
- Knowledge management system (KMS) is to support sharing information, which consists of three layers: (1) document management; (2) creating, sharing, and managing knowledge; and (3) corporate intelligence, serving as a virtual brain for enterprises.
- Performance Support System (PSS) refers to a range of tools that give direct support to performing the work. Training, KMS, and PSS should be combined in consideration of the differences in their approaches.
- There are methods other than training, such as the feedback method, job aids, incentive systems, selection criteria for employment, and redesigning of organization. Designing a human resources development system that adopts the means of training at the minimum necessary level should be considered.

Section 1 e-Learning system development process

Broadbent (2002) suggested that there are 4 phases in developing e-Learning at the system level: (1) GETTING READY, (2) ESTABLISHING THE FRAMEWORK, (3) HIGH-LEVEL IMPLEMENTATION, and (4) LOOKING AFTER THE DETAILS, presenting a model categorized into 4 phases and 17 elements in total. This model of 4 phases and 17 elements is summarized in figure 7-1. Although no detailed explanation is provided here, it should be referred to as the framework. In this chapter, the focus will be on the know-how to design elements of the system rather than to design the process.

Figure 7-1: Model of 4 phases and 17 elements of developing cycle of e-Learning (Broadbent, 2002)

Phase	Element	Description
GETTING READY	1: Management	Define structure of coordinating body. Articulate roles and responsibilities. Explain management business framework to all stakeholders.
	2: Learners	Determine how they learn best. Identify their performance gaps, experiences, and expectations.
	3: Research on e-Learning	Explore research and anecdotal information to determine how to implement e-Learning successfully in your environment. Explain findings to main stakeholders.
	4: Context	Identify driving and restraining forces for the acceptance of e-learning. Identify steps needed to attenuate the restraining forces. Explain findings to main stakeholders.
ESTABLISHING THE FRAMEWORK	5: Technology	Identify what technology is available, what technology will be needed, and the role of standards such as learning objects. Develop a relationship with your technical advisors.
	6: Business case	Identify the why, what, how of implementing e-Learning in business terms. Provide estimated costs and cost savings. Obtain approval for a phased project.
	7: Business model	Select the best model or models: integrated or decentralized, minimal or optimal, make or buy, independent or cooperative, national or international.
	8: Evaluation	Develop an evaluation strategy, some instruments, and the reports; then determine how evaluation results will be used with each phase.
HIGH-LEVEL IMPLEMENTATION	9: Communication	Identify who communicates with whom, how, what, and when. Identify what questions people have about e-learning. Build a change management strategy to answer people's questions about the new initiative.
	10: Administration	Set up the administration. Define the need for data on participation and for followup mechanisms. Determine which LMS is best for this role.
	11: Content	Identify what needs to be taught and developed, both internally and externally.
	12: Methodologies	Select training methodologies. Identify extent of blending of conventional and e-learning. Select from four types of e-learning (informal, self-directed, instructorled, and performance support tools).
LOOKING AFTER THE DETAILS	13: Human resources	Identify the required skills given the present capacity of the organization and develop an approach (train, recruit, or contract out) to acquire the necessary resources.
	14: Starting point	Identify which topics are best to teach at the beginning in order to foster high levels of usage, understanding, and buy-in. There is an opportunity here to do something innovative.

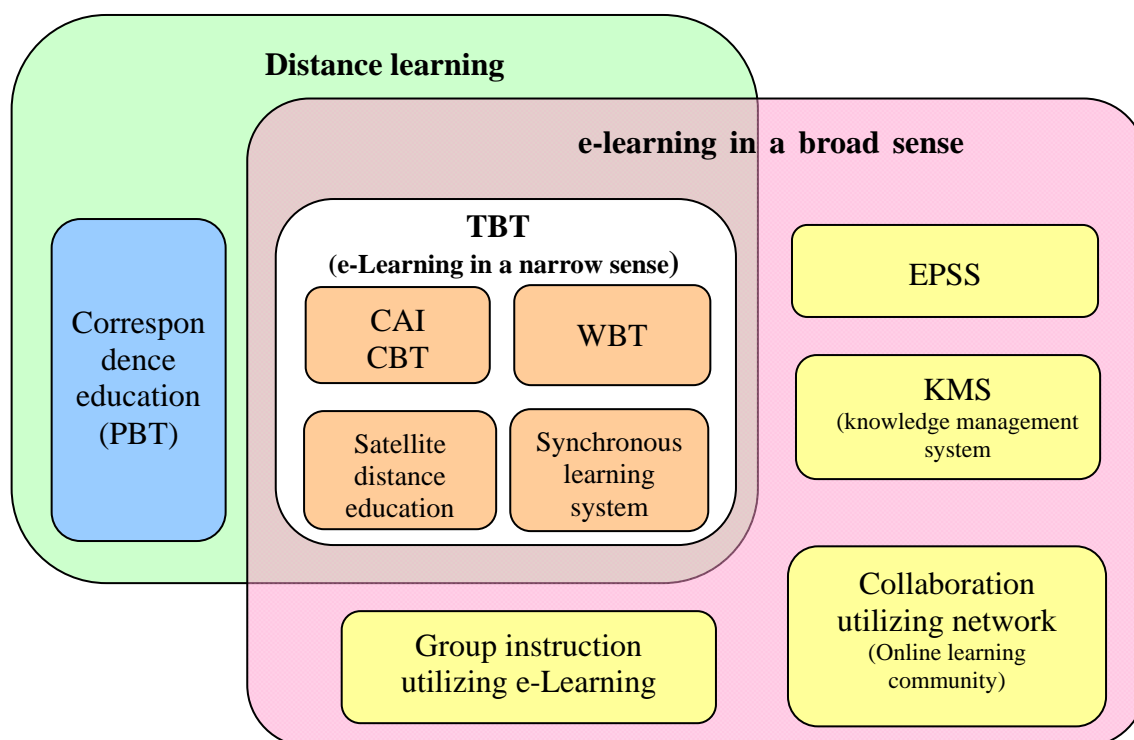
	15: Implement	Launch carefully. Communicate extensively with all users: learners, supervisors, instructors, and managers.
	16: Evaluate	Conduct an evaluation with quantitative and qualitative data.
	17: Re-jig	Continually review progress and revise items 1 through 16 above as required.

Note: Figure 4.1-4.(pp. 74-77) by Broadbent (2002), briefed by Suzuki

Section 2 Elements of e-Learning system

An e-Learning system includes elements such as a knowledge management system (KMS), a performance support system (PSS), an online community, and group learning, in addition to e-Learning in a narrow sense (online training), and all of them need to be designed (Figure 7-2). In Figure 7-2, elements of training are described as e-Learning in a narrow sense and “group instruction utilizing e-Learning” (the middle column). To combine (vertically) both of them is referred to as “blending” (Note: this word tends to be used also for a combination of other elements). The methods of blending are to be introduced in the next section (Section 3) in detail.

In order to pursue the direction that avoids training as much as possible, the key issue is how much to utilize the elements that represent e-Learning in a broad sense other than training (EPSS, KMS, and online learning community shown on the right end column in Figure 7-2). In Section 4, important points to keep in mind when looking at alternatives other than training are introduced in detail.



Source: Katori, K. (2001). "E-Learning management: strategy for human resources in the age of knowledge economy", Elco, P26, reprinting Figure 0-3 in this text

Figure 7-2: Similar concept of e-Learning (Katori, 2001)

Section 3 Blending techniques

7-3-1: Blending of core-type and both-end type

Blending is a method to design training by combining e-learning and other training methods such as group instruction. Nemoto (2002) emphasized that blending is not to retain an existing course, but to combine the advantages of group instruction and e-Learning in order to allow them to have specialized purposes. He points out that a course in which WBT and group instruction are blended can often be classified broadly into “core type” and “both-end type” as shown in Figure 7-3. As for other possibilities, Katori (2001) indicates two methods, one of which is individual training, conducted with learners being assembled in a learning center following the direction of instructors using WBT materials (Note: the example of Nihon Unisys learning introduced in a column in Chapter 4 is considered to be of this type), and the other of which is group training conducted by an instructor using WBT material as a supplement.

Figure 7-3 Blending trend of group instruction and e-Learning (Nemoto, 2002)

Core-type:	Group instruction before and after e-Learning
Assembly (pre):	Orientation (raise motivation)
e-Learning:	Learning and sharing knowledge
Assembly (post):	Resolving questions and doubts, correcting misunderstandings and deepening understanding
Both-end type:	e-Learning before and after group learning
Pre e-Learning:	Preparation for group learning, establishment of common knowledge base
Group instruction:	Specialized in conversation, debate, and group learning: multilateral orientation, changes in the way of thinking and attitudes, acquiring new concepts
Post e-Learning:	Providing new topics, review

Source: Nemoto, T. (2002) “E-human resources development: Construction of the learning architecture”, Chuokoron-Shinsya, p. 65

7-3-2: When is the right time for applying group training and instructors?

Group training led by instructors has been the major method used in existing training. Meanwhile, a leader in charge of the training is applied also to on-the-job training (OJT), and we have learnt that the effectiveness of the OJT depends on the quality of the leader. In recent years, the advancement of the technology used in distance education has realized platforms such as enabling learners to interact with instructors (or mentors) who are in distant places, and it has completely changed the concept of distance education, which once meant solely individual learning. While the possibilities for instructors to take active parts increase, more preparation is also required of the instructors. In the future, for example, in addition to having the skill to establish personal relations with the learners in the classroom, instructors may need to be accustomed to interact with the learners in a distant place by using emails.

In blending, group training is not the only situation where instructors (or mentors) are employed. For instance, in a practical guide dealing with multimedia ID (Lee and Owen, 2003), training methods are categorized into the following categories, according to their characteristics: (1) instructor-led, (2) computer-based training (CBT), (3) distant broadcasting,

(4) web-based training (WBT), (5) audio tape, (6) video tape, (7) performance support system (PSS), (8) electric performance support system (EPSS) (For more details, refer to Chapter 10, Media analysis, Lee & Owen, 2003). Figure 7-4 shows advantages and disadvantages of the training led by instructors (Lee & Owen, 2003).

Figure 7-4: Advantages and disadvantages of the training led by instructors (Lee & Owen, 2003)

Advantages

- Allows social interaction.
- Useful with variable-size audiences.
- Personalized feedback.
- Integrates a variety of media.
- Materials can be tailored to the group or adjusted by the instructor while in progress.
- Short development time.
- Traditional method of teaching that is comfortable for students and instructors.
- Because learners are removed from work environment, they can focus on the course free of distraction.

Limitations

- Scheduling may not meet the needs of all who require the information or instruction.
 - Not enough time to give everyone feedback they may need.
 - Moves at one pace, or at the pace of the majority of the class, and does not account for individual rates and styles of learning.
 - Lack of transfer to the workplace.
 - Relies heavily on instructor knowledge.
 - Inconsistent delivery and certain areas stressed or deemphasized, causing gaps in learning and varied levels of learner involvement.
 - Inconsistent evaluation
 - Travel time and expense, whether for participants to attend at a centralized location or for instructor travel.
 - Only limited numbers can participate at one time.
-

Note: From the original book by Lee & Owen (2003), p. 53

Here, the training by instructors is considered not only for group instruction but regarded as “the training which is conducted in a group or OJT using materials presented by teachers or facilitators, and which utilizes education methods such as lectures, discussion, demonstration, and workshops.” From such a viewpoint, its advantages and disadvantages are identified in comparison with other media. In deciding how human instructors should be involved throughout group instruction and e-Learning, the advantages and disadvantages can be used as indicators in the blending process.

7-3-3: When is the right time to use presentations

The training can be divided into three patterns: presentations by lecturers, individual learning, and group activity. According to the guidance to select the most appropriate pattern from the three, the key points are: (1) Which instructional pattern is most suitable for each component of the topic's subject content and learning objectives, (2) How can each category of required learning be treated most effectively, (3) How can such important practices and outcomes as inquiry-based learning be accomplished, (4) To what extent can a student receive help on a topic or skip ahead if competence is already shown, and (5) How can a student's special interests and needs be best recognized and served (Kemp, 2000, p. 52).

As we think of blending, considering “group instruction = presentation by instructors” in a fixed way can be an inflexible way of thinking, even though it has been considered as such in the past. E-Learning has enabled us to do “remote delivery of presentations by instructors,” thus we need to examine when is the right time to require learners to assemble in a single classroom. Is it for presentation, or for something else?

The situations to use an instructor may be not only for providing presentations, but also for providing advice for individual learning or supporting progress of group learning. From another viewpoint, an instructor is not only the person who gives presentations: students can also do presentations. In response to the realization of “distant delivery of presentations,” the roles of living humans in synchronous session and the skills required of them should be re-examined as appropriate.

On the other hand, presentations are a fundamental element for the training. We need to recognize the significance of presentations as an education method when it is compared with other methods. Figure 7-5 is a list of the situations where presentations are considered effective. We must divide them into those that must be performed face-to-face (by a human being sharing the same place and time) and those that can be done by delivering “recorded” presentations or by live broadcasting from a distance.

Figure 7-5: The situations where presentations can be used effectively (Kemp, 2000)

-
- As an introduction, overview, or orientation to a new topic or theme.
 - To motivate students by creating interest in the topic or theme, often by viewing a video, a multimedia presentation, or having a meaningful experience such as on a field trip.
 - To present basic or essential background information in order to prepare students most efficiently for group or individual activities.
 - To provide a one-time guest speaker.
 - To provide a video or other visual program that can conveniently present information to the entire class at the same time.
 - To offer a presentation or aspects of a course through electronic distance learning as an effective and efficient teaching method, often combined with computer networking or other group and individual activities.
 - To provide opportunities for students to make presentations as reports to the whole class.
 - As a review or summary when study of a topic is concluding.
-

Note: from the table by Kemp (2000) p.48.

7-3-4: The advantages of well-designed e-Learning

The effectiveness of e-Learning blended with group instruction depends on how well the e-Learning component is designed, in the same way that the effectiveness of group instruction depends on the quality of the instructor. Broadbent (2002) identifies the benefits of well-designed e-Learning from the four standpoints of learners, instructors, online developers and managers, as shown in Figure 7-6. The points he identifies should be regarded as at an optimal state “when e-Learning is well designed”; thus, they are potential advantages of e-Learning. Therefore we should strive for creating an e-Learning system that can realize these potential benefits of e-Learning. In this meaning, this list can be considered a guideline to realize a high quality e-Learning system.

Figure 7-6: Benefits of well-designed e-learning (Broadbent, 2002)

<For learners>

1. Creates interactions that stimulate understanding and the recall of information when learners exchange questions during online discussions.
2. Accommodates different types of learners and fosters learning through a variety of activities that apply different learning styles.
3. Fosters self-paced learning so learners can learn at the rate they prefer.
4. Provides convenient access to learning any time, any place.
5. Reduces travel time and travel costs.
6. Encourages learners to browse for information through hyperlinks to sites on the World Wide Web.
7. Allows learners to select targeted and appropriate material on the Web.
8. Provides context-sensitive help through performance support tools.
9. Develops technical abilities required to use the Internet.
10. Encourages learners to take responsibility for their learning and builds self-knowledge and self-confidence.

(Note: continues to the next page)

Figure 7-6: Benefits of well-designed e-learning (Broadbent, 2002) (continued)

<For instructors>

1. Provides convenient access for instructors any time, any place.
2. Allows pre-packaging of essential information for all students to access and frees instructors to concentrate on high-level activities in the delivery phase.
3. Retains records of discussion and allows for later reference through the use of a threaded discussion or streaming video.
4. Generates more personal gratification for instructors through quality e-learner participation.
5. Reduces travel and accommodation costs associated with training programs.
6. Encourages instructors to access up-to-date resources on the Web.
7. Allows instructors to communicate information in a more engaging fashion than possible in text-based distance education programs.

<For online developers>

1. Promotes the orderly layout of course materials, assignments, and general administration through a Web site.
2. Sets a framework for rapidly updating learning materials.
3. Encourages the use of innovative, interactive tools such as polls and quizzes.
4. Facilitates the linking of learning to tools for competency assessment and performance management.
5. Facilitates access to a rich assortment of existing Web-based resources.
6. Allows for automated replies to knowledge-based questions.
7. Fosters meaningful exchanges among participants through the discussion capabilities of the Internet.
8. Adds an engaging, personalized element through technologies such as audio files and streaming video and personalized videoconferencing equipment.

<For managers>

1. Provide automated, continuous assessment and reporting of student participation and progress.
2. Reduce capital costs associated with traditional brick-and-mortar schools and training facilities.
3. Reduce costs of learning materials, mailing and telephones associated with distance learning programs.
4. Allow access to the same materials through a variety of platforms such as Windows, UNIX, and Mac through the use of html files in a browser.
5. Create more consistency in the training program through a template approach.
6. Create a one-stop shopping center through training coordination software to offer courses from across the organization.
7. Provide access to leading instructors worldwide.

Note: From Broadbent (2002), pp.31-35.

7-3-5: Choosing training that methods match the training purpose

Figure 7-7 identifies appropriate training methods depending on the purpose of the training. From this figure, we can read that classroom training is an appropriate method except for the purpose of “knowledge retention.” Classroom training also has great advantages in the training aiming at “changing attitudes” or “interpersonal skills” compared with other training methods. However, for the purpose of “knowledge acquisition” or “problem solving,” other training methods have the same level of effectiveness. It is suggested that a possibility of adding to group training elements of individual learning or performance support tools (Note: EPSS is categorized as an alternative other than training in Figure 7-2), depending on the situation. It is essential to combine those alternatives appropriately to design a whole e-Learning system.

Figure 7-7: Effectiveness of training method depending on training purposes (Piskurich, 2000, p. 76)

Purpose/Method	Classroom	OJT	Self-Instruction	TBT	Job Aids	Documentation
Knowledge Acquisition	**	*	**	**		*
Problem Solving	**	*	*	**	**	
Changing Attitudes	**	*		*		
Interpersonal Skills	**			*		
Knowledge Retention		**	**	**	**	

Note: The more dots the better the learning activity setting is.; TBT = training using technologies including distance learning (classroom training or individual learning realized virtually)

Figure 7-8 shows a checklist for choosing the training method. In Figure 7-8, check items that are suggested for Technology-based Training (TBT) are divided into those that are used through a network (described as WBT) and those that are not (TBT). It is important to choose or combine these methods flexibly according to your situation.

Figure 7-8: Checklist for choosing training methods (Piskurich, 2000)

Method	When to use
CLASSROOM TRAINING	<ul style="list-style-type: none"> <input type="checkbox"/> Interaction with the trainer or other participants is important <input type="checkbox"/> Guided discussion will lead to more learning <input type="checkbox"/> Questions will come up that need immediate answers <input type="checkbox"/> You have qualified facilitators in the right numbers to match the training load <input type="checkbox"/> The trainees can afford to be away from their jobs for long periods of time <input type="checkbox"/> The facilitators will do the traveling instead of the trainees <input type="checkbox"/> Individualization is not critical <input type="checkbox"/> You want more control over the training outcome
ON-THE-JOB TRAINING	<ul style="list-style-type: none"> <input type="checkbox"/> Skills need to be mastered in the actual environment <input type="checkbox"/> Training time is limited <input type="checkbox"/> Design time is limited <input type="checkbox"/> Non-moveable equipment is involved <input type="checkbox"/> Trainee motivation is poor <input type="checkbox"/> The tasks to be learned change frequently <input type="checkbox"/> Qualified classroom trainers are not available <input type="checkbox"/> Work flow must be learned as part of the training <input type="checkbox"/> A lot of monitored practice is necessary <input type="checkbox"/> The number of trainees is small
SELF-INSTRUCTION	<ul style="list-style-type: none"> <input type="checkbox"/> There are a number of highly distributed training sites <input type="checkbox"/> You have a shortage of qualified classroom or OJT trainers <input type="checkbox"/> Turnover is high <input type="checkbox"/> Training must be delivered "just in time" <input type="checkbox"/> Training must be consistent <input type="checkbox"/> The content is relatively stable <input type="checkbox"/> The content is known only by one or a few SMEs <input type="checkbox"/> The training will be repeated often <input type="checkbox"/> You want to decrease travel costs <input type="checkbox"/> The training must be done on multiple shifts <input type="checkbox"/> You have the time to develop the programs properly
TECHNOLOGY-BASED TRAINING	<ul style="list-style-type: none"> <input type="checkbox"/> Self-instruction is needed (see self-instruction checklist) <input type="checkbox"/> Complex simulations are needed <input type="checkbox"/> The content requires a lot of practice that can be simulated <input type="checkbox"/> The trainees are comfortable or can be made to feel comfortable using computers <input type="checkbox"/> Training is difficult to schedule/classes are hard to fill <input type="checkbox"/> There is plenty of development time and money available <input type="checkbox"/> The hardware is in place or can be bought easily <input type="checkbox"/> Tracking of the training is critical and time intensive due to a large number of trainees <input type="checkbox"/> Management is comfortable with TBT or can be sold on the concept <input type="checkbox"/> Updates to the program will be minimal <input type="checkbox"/> The use of multiple media formats will enhance the learning

Method	When to use
<p>NET-BASED TRAINING (INSTRUCTOR LED OR SELF-INSTRUCTION)</p>	<p>Use Net-based training when your environment requires a distributed delivery and:</p> <ul style="list-style-type: none"> <input type="checkbox"/> You need TBT (see TBT checklist) but revisions to content are frequent <input type="checkbox"/> Video is not a critical element in the training <input type="checkbox"/> Live interaction with an instructor is important <input type="checkbox"/> Other content is already available that can be easily linked <input type="checkbox"/> Content is more soft-skill oriented (instructor led) <input type="checkbox"/> Heavy feedback (immediate or time sensitive) is required <input type="checkbox"/> Trainees are comfortable with Net technology <input type="checkbox"/> Your internal systems can support the usage <input type="checkbox"/> Time and budget are available to produce and implement the training <input type="checkbox"/> You have a large number of training programs that need to be delivered and re-delivered at various times
<p>JOB PERFORMANCE AIDS (Note: in fig. 7-2, EPSS is categorized as an alternative other than training)</p>	<p>Consider creating job performance aids in lieu of training when:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The task(s) are performed infrequently <input type="checkbox"/> It is critical that the task(s) be performed exactly <input type="checkbox"/> The task(s) are very complex <input type="checkbox"/> Sequencing of the task(s) is critical <input type="checkbox"/> Turnover is high <input type="checkbox"/> Training cannot be done in a timely manner <input type="checkbox"/> The consequence of performing the task(s) incorrectly is severe <input type="checkbox"/> Tasks change frequently <input type="checkbox"/> The body of knowledge is great <input type="checkbox"/> Practice and feedback are not critical

Note: The checklist (pp.76-79) created by Piskurich, 2000

Section 4 Looking at alternatives other than training

In Figure 7-2, EPSS, KMS, and online learning community are indicated as three alternatives to training. It is necessary to design an environment that reduces the weight on training as much as possible and yet increases ability and allows learners to learn from each other as an organization. In such a situation, it is important for instructional designers to have a certain understanding of alternatives other than training.

7-4-1: EPSS [Electronic Performance Support System]

According to Gary (1991), EPSS is an integrated electronic system that provide on-demand access, tools, and methods to realize high-level job performance with minimum support from other persons. In general, characteristics of EPSS are considered to be: (a) computer-based, (b) possible to access during tasks, (c) possible to use during work, (d) allows control by users, (e) reduces the necessity of prior training, (f) easy to update, (g) realizes quick access to the information, (h) does not include inappropriate information, (i) accepts differences in the level of knowledge of the users, (j) accepts different learning styles, (k) integrates information, advice, and learning experiences, and (l) adopts artificial intelligence (Note: this paragraph is a reprint from Chapter 2. In chapter 2, the ID process is sped up by using EPSS as a tool for instructional designers. It is discussed here again as one of e-Learning methodologies that are designed by instructional designers).

EPSS can consist of a searchable information database including online documents, information of job contents, and past examples; learning experience capability that enables users to rehearse a job just before executing it; help and coaching functions that assist users to execute a job; an advisor function that supports users in making a decision; and application software including templates and forms customized for each job. In the 1990s, EPSS was adopted widely mostly by large enterprises in the United States; it has been aiming to prepare an environment that enables an inexperienced (or newly employed) employee to perform the job as effectively as experienced employees with minimal training (or from the first day of work without training) without any instruction. With a good EPSS, everything necessary to perform the job can be provided on site (just-in-time).

For instance, when Mr. A, a salesperson newly employed by a large enterprise adopting EPSS, turns on the computer provided for him, how does it support him to perform the job? Let's see a virtual example (Wager & MaKay, 2002). Only by operations with a mouse of PC, he can do things such as those shown in Figure 7-9.

Figure 7-9: On Mr. A's first day on the job; Mr. A is a salesperson newly employed in an enterprise adopting EPSS

-
- **As online information:** data of the customers assigned to Mr. A, the latest data on the product he sells, inventory and delivery schedule, online manual. This information is searchable and updated constantly as necessary.
 - **As an operation assistant (wizard):** It instructs him how to fill out and submit the sales form, how to create necessary documents, and other necessary procedures step by step.
 - **As software to increase performance:** It provides word processing software with templates such as order sheets he needs to create for customers, suppliers, and other related persons.
 - **As a troubleshooter:** When Mr. A inputs a question on sales strategies, it provides the company strategy and advice from experienced seniors.
 - **As TBT:** Just before doing a new job, such as visiting a potential customer, he can access a material for quick training that is directly related to the job.
 - **As system-driven help:** It monitors the status of use of EPSS by Mr. A and automatically provides help when he does not utilize it or uses it ineffectively.
 - **As the latest information:** It delivers the latest news in the company that could serve as a useful reference for him as a salesperson.

Note: from the body text written by [Wager & MaKay, 2002, pp. 135-136](#), summarized by Suzuki.

Providing training is not the purpose of training, and with rising requirements for increasing performance ability, EPSS has been recognized as a solution that attracts attention. However, EPSS is adopted less frequently than expected, due to concern from managers that the cost of initial investment is too high, and worries of employees that they might not be able to keep up with the changes that may happen along with installation of EPSS. Wager & MaKay (2002) indicate that the following are commonly observed where EPSS is adopted.

- (1) In most existing implementations of EPSS, possibilities such as those expected by Gary (1991) are not fully realized; they are partially utilized.
- (2) Although EPSS is installed, it does not realize the concept that “inexperienced employees can work, as effectively as experienced employees, from the first day of work.” It does not serve as a full replacement for training. However, there are many examples in which training time is significantly reduced, EPSS serving as part of training (Example: American Express reduced 83% of the time taken for training).
- (3) From examples in which cost effectiveness are examined, it is revealed that EPSS is an effective solution in terms of cost. (Example: One of the divisions in Hewlett Packard succeeded in reducing more than 90% of the time taken for training related to new products, resulting in a cost reduction of 98%).

EPSS has already had significant impact on the work of instructional designers in that they adopt it as an alternative method of training or they reduce training time by constructing training with a view of performance supporting tools to be used when learners join their workplace after the training. (Note: it seems that this is why it is included in Figures 7-7 and 7-8 as one

alternative to training). In the future, EPSS will become an indispensable factor as a core element of e-Learning, including coordination with KMS, which is to be discussed next. In this regard, EPSS is expected to be utilized to improve the training itself structurally, regarding it as “a part of” training rather than “an alternative” to training as pointed out by Wager & MaKay above. Apart from the attitude to “learn everything from the instructor,” changes in the mindset will be required to accomplish learners’ independence to gather information they need by themselves, and enhancing an attitude to share with colleagues the information they have learned through their job. The requirement of such belt-tightening measures for organizational structural improvement itself would be a reason to generate negative reactions to EPSS, and an ID technique to design and manage the changes may be required in such cases.

7-4-2: KMS [Knowledge management system]

Rosenberg (2001) explicates the e-Learning theory that focusing on online training and KMS as two halves of the same whole (refer to Figure 6-1 in Chapter 6 in this text). Rosenberg defines knowledge management as “Knowledge management supports the creation, archiving, and sharing of valued information, expertise, and insight within and across communities of people and organizations with similar interests and needs.” (p. 66). He also explains that knowledge management is a *virtual brain* of an enterprise and has functions of (1) “learning,” which is to know information and apply it to new situations, (2) “vision and action,” which is to observe the surrounding world and act, (3) “storing information,” which stores all of the information in the enterprise as a warehouse, (4) “toolbox,” which is used to access the performance support tools or system, (5) a huge “suggestion box” which functions as a place for brainstorming, and (6) “integration” which integrates the whole enterprise as one.

Figure 7-10 shows three levels of layers that represent KMS described by Rosenberg (2001). He indicates that as the level rises from document management (level 1), through information creation, sharing, and management (level 2), into enterprise intelligence (level 3), KMS is integrated to the actual work.

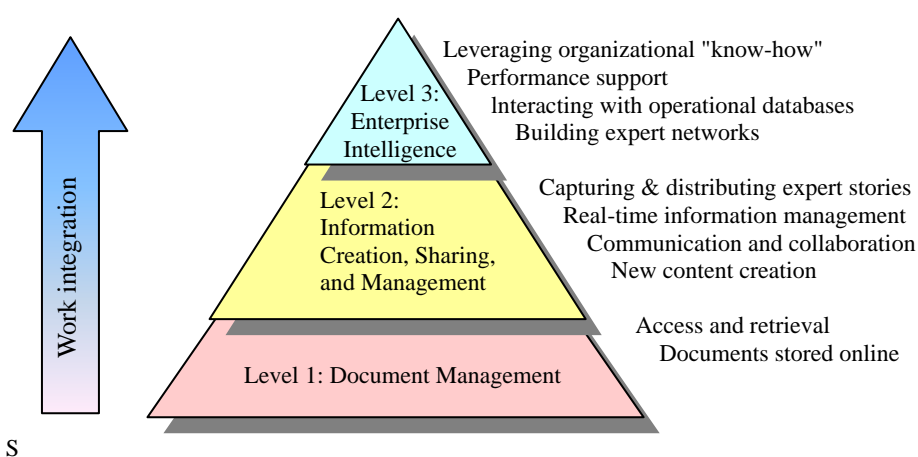


Figure 7-10: The Three levels of the knowledge management pyramid (Rosenberg, 2001)

Source: Rosenberg (2001) “E-learning: Strategies for delivering knowledge in the digital age”, McGraw-Hill. figure 4-3(p.71)

Figure 7-11 is a table comparing KMS, training, and PSS, as identified by Rosenberg (2001). PSS indicates a range of tools that directly support performance of work, regardless of whether or not they use electronics (E for EPSS). While indicating those three works as a whole, he discusses the differences between the approaches that the reader should know.

Figure 7-11: Comparison of training, KMS, and PSS (Rosenberg, 2001)

Training	KMS	PSS
Purpose is to instruct	Purpose is to inform	Purpose is to guide performance directly
Requires the interruption of work to participate(even online)	Normally requires less work interruption than training	Least interruption from work (ideally integrated directly into work tasks)
Program dictates how the user will learn	User determines how s/he will learn	Task at hand defines what the tool will do. Learning is secondary to performance
Goal is to transfer skill and knowledge to user	Goal is to be a resource to user	Goal is to assist performance (or do it completely)
Sales Example #1: Teaching selling skills	Sales Example #1: Accessing customer information in preparation for a sales call	Sales Example #1: A tool to help create a sales proposal
Technical Example #2: Training technicians to fix a computer system	Technical Example #2: Accessing an interactive troubleshooting database on a particular piece of computer hardware	Technical Example #2: Using a diagnostic tool to pinpoint a failed component in the computer
Characteristic user expression: "I know what to do, and why (but adding information and tools will help me do it better and easier)."	Characteristic user expression: "I can get the information that will help me do it (but I still need to learn how to find the information I need)."	Characteristic user expression: "I don't need to know how to do it—the system does it for me (but I still need to learn how to use and monitor the system)."

Source: Rosenberg (2001) “*E-learning: Strategies for delivering knowledge in the digital age.*”, McGraw-Hill, Figure 4-1(pp.77-78)

Note: The author does not fully agree with the point that the learning method for training is determined by programs. It is possible to allow learners to choose the content of the training if designed in that manner. The author fully agrees with the point that EPSS does not make the user wiser. Instructional designers need to be aware of this especially in terms of long-term human resource development.

7-4-3: Management methods other than ID that instructional designers need to be aware of

Rothwell & Kazanas (1998) say in the textbook “Mastering the instructional design process”, “While most books on in instructional design do not treat these solutions, stakeholders of the instructional design process such as senior executives and operating managers increasingly demand that instructional designers broaden their focus to provide performance consulting and avoid restricting themselves to instructional solutions alone.” (p. 15), and discuss the methods other than training throughout Chapter 2 in the textbook. Considering the increasing number of cases in which instructional designers adopt a method other than ID (instead of ID, or concurrently together with ID), they indicate that instructional designers should know five alternatives that are frequently used (feedback methods, job performance aids, reward system, employee selection practice, and organizational redesign) and explain them in detail. Since

they also give advice “in conducting, consult with specialists in the field,” it seems that they consider these solutions to be beyond the job scope of instructional designers. Here, these alternatives are introduced briefly as shown in Figures 7-12 to 7-16, from the viewpoint that in designing an e-Learning system, human resource development as a whole should be looked at.

Figure 7-12: (1) Feedback Methods (Rothwell & Kazanas, 1998)

What	When	How
Information about an activity. It influences the quantity and quality of performance. It can be either incidental or intentional.	Performance problem caused by deficiencies in knowledge, skills, or attitudes, which performed in the past and used the skill often.	Clarity and timeliness. Coaching during work activities, production wall charts, memorandums directives to employees, holding team meetings, formal/informal performance appraisal, 360-degree (all-direction) feedback from all the people involved, customer surveys, etc.

Figure 7-13: (2) Job Performance Aids (Rothwell & Kazanas, 1998)

What	When	How
It can be accessed and used in real time, provided signals when to perform the task, provided direction on how to perform each task, and reduced the quantity and/or time the information may be recalled.	When the consequences of errors are great, procedures are complicated, work tasks are not frequently performed, the time for training is limited, and the budget for training is also limited. They are inappropriate when employees have no time or when an employee's credibility with customers will be undercut during performance of a work task.	Virtually anything that provides on-the-spot, practical guidance can be considered a job aid, such as cues built into the questions on an application form, include cleaning instructions sewn into clothing, and warnings on medicine bottles. Checklists, algorithm flowcharts, procedure manuals, work samples, etc.

Note: A job performance aids is cheaper than training and it is easy to adjust changes without a heavy burden. It results in a reduction in time and long-lasting effect of training result by adopting it as a checklist or workbook together with training. There is a golden saying; “Inside every fat course is a thin Job Aids crying to get out” (Harless, 1985, p. 5: quotations within).

Figure 7-14: (3) Reward systems (Rothwell & Kazanas, 1998)

What	When	How
It is the organization's way of tying employee actions to positive consequences. This attracts people to join, keeps them working, and motivates them to train or perform. Excellent organizations tend to match rewards to organizational goals and desired results, and care must be taken to avoid unethical manipulation of human beings.	Rewards or work consequences should be reviewed when planning any change that will affect the organization, work group, individual, or job. When the problem caused by obstacles rather than by a lack of skills on the part of the individual, or the employee expect not to be rewarded as a result of performing as desired, review reward system.	Reward systems should be intentional, external, and standardized. They can be classified as monetary incentives, such as salary, differential Pay, allowances, time off with pay, and deferred income, or nonmonetary incentives, such as working conditions, staff support, training, access to information, freedom to innovate, etc.

Figure 7-15: (4) Employee selection practice (Rothwell & Kazanas, 1998)

What	When	How
Effective employee selection practices involve matching people to work for which they are qualified. Instructional designers can help to describe and analyze the work, and establish selection criteria appropriate for choosing people.	When turnover is high, involuntary termination rates are increasing, employees are complaining that, at the time they were recruited for or placed in their current positions, they were not expecting the work activities they subsequently encountered and supervisors and managers are complaining that their employees are ill-equipped.	Recruitment based on a long-term plan, establishing internship programs to build relationship with applicants, continuous recruitment, targeting sources of talent, and efforts at accepting applications such as establishing internal job posting. Examining the completeness, accuracy, and currency of existing job descriptions, and providing criteria for evaluating and the contents of the job performance. Examining the selection test or interview method. Approaching to use part-time or contingent workers.

Figure 7-16: (5) Organizational redesign (Rothwell & Kazanas, 1998)

What	When	How
Organizational redesign is the process of changing assigned goals, responsibilities, and reporting relationships within a given organization.	When the following symptoms are evident: the following symptoms are evident: (1) confusion about job responsibilities; (2) vague or unclear job descriptions; (3) outdated organization charts; (4) unclear relationships between the organization's stated strategic goals and its structure; (5) complaints from supervisors and managers about overseeing too many people or too many different jobs; (6) pockets of "burned out" employees doing boring work, too much work, or too little work; (7) inefficient workflow, resulting in inefficient steps, unnecessary complexity, or other wasteful uses of resources; or (8) inability by the organization to adapt swiftly to dynamic conditions in the external environment, such as new competitors or unusual requests from customers or suppliers.	Be aware that logical approaches, which is one of the advantages of ID, do not always prevail due to "political" issues. To carry out organizational redesign, (1) changing reporting relationships; (2) improving information sharing; (3) defining job responsibilities; (4) changing job responsibilities; (5) changing goals, objectives, or standards; and (6) increasing information available about workflow systems.

Note: Figures 7-12 to 16 are from the body text of Chapter 2, Rothwell & Kazanas (1998), briefed by Suzuki.

References

- Katori, K. (2001) *e-learning management: strategy for human resources in the age of knowledge economy*, ELCO [In Japanese]
- Nemoto, T. (2002) *E-human resources development: Construction of the learning architecture*, Chuokoron-Shinsya [In Japanese]
- Rosenberg (2002) *E-learning strategy*, Hiromichi Nakano (trans), Softbank [M.J. Rosenberg (2001). *E-learning: Strategies for delivering knowledge in the digital age*. McGraw-Hill]
- Broadbent, B.(2002). *ABCs of e-learning: Reaping the benefits and avoiding the pitfalls*. Jossey-Bass/Pfeiffer, ASTD.
- Gery, G. (1991). *Electronic performance support systems*. Weingarten Publications, Boston, MA
- Harless, J. (1985). Performance technology and other popular myths. *Performance and Instruction Journal*, 24 (6), 4-6. [Quoted in Rothwell & Kazanas(1998)]
- Kemp, J. E. (2000). *An interactive guidebook for designing education in the 21st century*. TECHNOS Press of the Agency for Instructional Technology
- Lee, W. W., & Owen, D. L. (2000). *Multimedia-based instructional design*. Jossey-Bass/Pfeiffer. [William W. Lee and Diana L. Owens (2003), Yasumasa Shimizu (trans. supervisor), e-learning Consortium Japan (trans.) *Introduction of Instructional Design – Instructional Design for Multimedia*, Tokyo Denki University Press]
- Piskurich, G. M. (2000). *Rapid instructional design: Learning ID fast and right*. Jossey-Bass/Pfeiffer.
- Rothwell, W. J., & Kazanas, H. C. (1998). *Mastering the instructional design process* (2nd Ed.). Jossey-Bass.
- Wager, W. W., & McKay, J. (2002). EPSS: Visions and viewpoints. In R. A. Reiser, & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology*. Pearson Education, 133-144 (Chapter 10).

	End of chapter report assignment (Chapter 7)	
--	--	--

Write a report on one or more of the following three assignments:

- 1) After reading this chapter (Chapter 7), write a report including questions, comments, opinions, or thoughts you have. If you have past experience, additional information, or have conducted research (attach the name of the source of information), include them to deepen your understanding.
- 2) Analyze what training methods are combined into e-Learning examples that you know. Use Figure 7-8: Checklist to choose training methods, as a reference to analyze them and examine whether or not they have good combinations. If you think they can be improved, examine the possibility of what to change and how. Additional analysis and comparison with your experiences not limited to e-Learning, such as education in school or company, or educational activity you are involving in are encouraged to deepen your understanding.
- 3) Identify your opinion (it can be for, against, or for with conditions) on the standpoint that “human resources development should be accomplished while avoiding training as much as possible.” In this regard, also consider the golden saying, “Inside every fat course is a thin job aid crying to get out” (Note at Figure 7-13).