

Chapter 6 Components of e-Learning

(What you can design)



Learning Objectives:

- Be able to explain, based on examples of e-Learning, what we must (or can) design at four levels in order to achieve successful e-Learning.
- Be able to analyze the relationship between your job description (range of work responsibility) and the elements of e-Learning you can design.

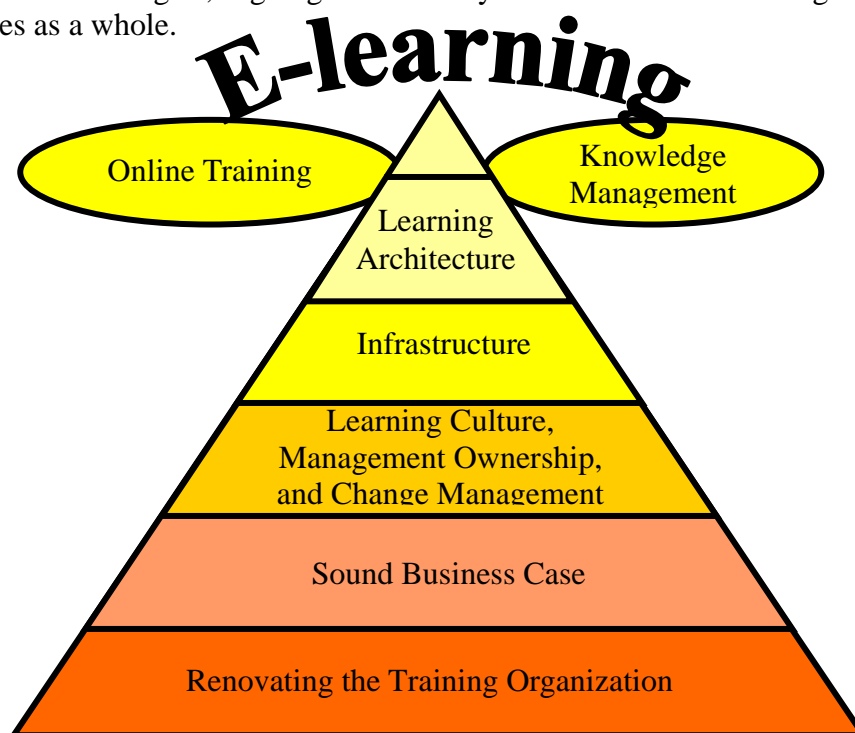


Summary of this Chapter

- E-Learning presses for organizational changes as well as changes in the way of thinking about learning of the people who constitute the organization. To achieve successful e-Learning, we must utilize ID at various levels.
- At the cultural level, we are to design an environment which accepts learning itself as an important activity for all employees.
- System level components include, not only training, but KMS, PSS, among others, which constitute e-Learning as widely defined. It is important to design toward the direction to lessen the dependency on training. Recently, people have come to consider that the application of ID at system level is important.
- As for course level design, we are to design a variety of training courses for which ID has conventionally been responsible.
- In terms of usability design, we are to design display layouts which are comfortable to see and easy to understand, navigation design, color scheme and utilization of appropriate media, and access time.
- Horton's sketch provides a clear image of the tools required for the design at each level.
- When you replace an old system with a new one, you must design its process while referencing the findings from research on diffusion of innovation.

Section 1 Designing toward successful e-Learning

Rosenberg (2001) draws a picture of strategic foundation for successful e-Learning shown as Figure 6-1. As seen in this picture, e-Learning consists of two main elements, (1) on-line training and (2) knowledge management, which are supported by learning architecture (coordination with other learning activities) and infrastructure (from Web access to learning management system). In addition, such structure is supported by development of a culture which has a positive attitude toward learning and establishment of support by the top management and change management. Down at the very bottom, we find a healthy business model (whose success is not measured by the number of attendance days or course fee revenue) and renovation of the department which is in charge of training (for the purpose of departure from old-style habits in relation to human resource development) supporting the whole structure. Rosenberg (2001), allocating a whole chapter to each level, gives detailed explanation of the strategies, arguing that the key to successful e-Learning is to design all these strategies as a whole.



Source: Rosenberg (2001), "e-Learning Strategies", p. 34

Figure 6-1: The Strategic Foundation for E-Learning depicts all the critical components for successful e-learning initiatives. (Rosenberg, 2001)

Katori (2001), from the stance that the human resource strategy in the time of the knowledge economy lies in e-Learning, draws the overall picture of e-Learning community which rejuvenates the organization as shown in Figure 6-2. He summarizes that we have to carry out our human resource development based on four main pillars, which include two main concepts pointed out by Rosenberg (2001); i.e., "e-Learning: learn from training" and "knowledge management system (KMS), learn from information," and "performance support system (PSS), learn from experience" as well as "e-Learning community, learn from interaction with other learners." He points out that, to achieve this, the concept of "Learning Organization" (Senge, 1990) as structural/cultural infrastructure of corporate learning environment, is important.

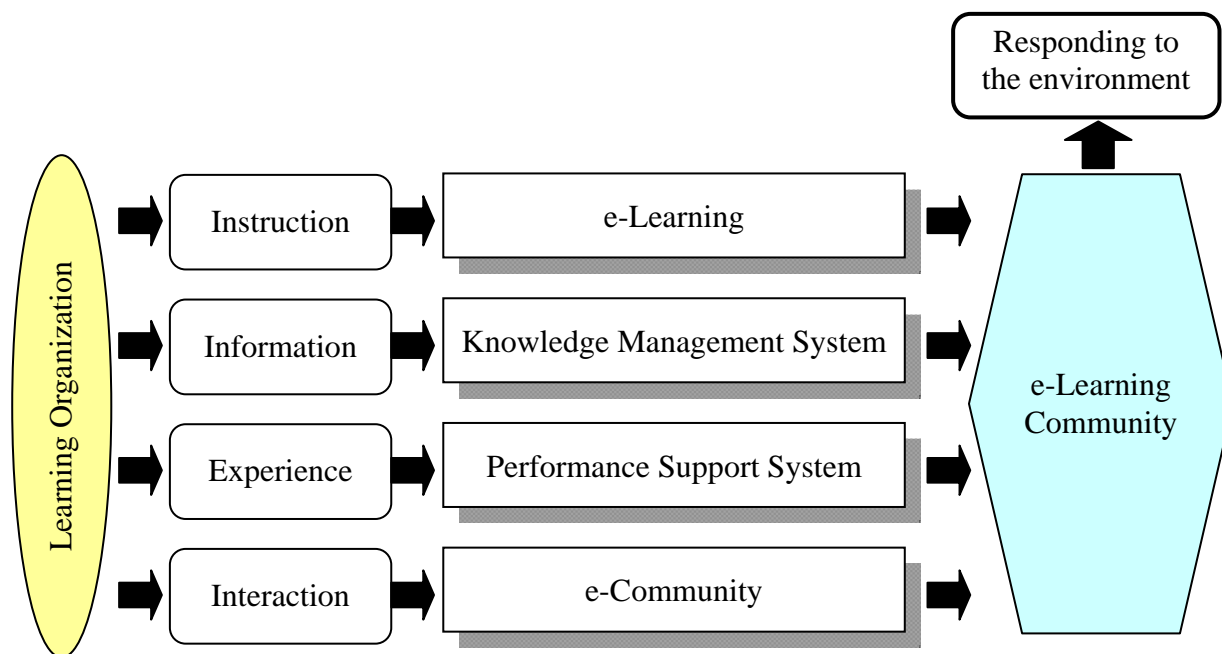


Figure 6-2: Overall picture of the e-Learning community (Katori, 2001)

Source: Katori (2001). *e-Learning management*, Elco, p. 91.

What is common to Rosenberg (2002) and Katori (2001) is the stance that e-Learning presses for organizational changes as well as changes, in relation to learning, of the way of thinking in the people who constitute the organization. Their stance is that such passive design that “considers e-Learning an extension of what has been before”; i.e., tries to make the conventional training a little bit more effective by taking advantage of newly available useful tools, will not be able to catch up with the pace of change which is happening in our society. We should try to achieve fundamental change rather than a little bit of improvement.

The fundamental change, for an organization, is based on the idea that “e-Learning is not a cost but an investment.” The change requires each member of the organization to have such independent/positive attitude as “learning is not the sort of thing which you receive passively, but it is a thing toward which you yourself move to get.” ID works most effectively under such condition as people take a severe stance toward performance expecting a high Return on Investment (ROI). The organization as a whole must come out of a state of “waiting for instruction.” For the purpose of promoting e-Learning, a department must be established, which is directly linked to the top management to implement an effective and attractive e-Learning environment. All the members of organization, serving as “human resources,” keep improving themselves by taking every opportunity to learn as well as collecting information and acquiring skills necessary for them to carry out their duties. Information and experience are shared. All employees are sensitive to change and everyone keeps moving upward while working happily. Let us discuss how ID can be useful to support all these things just mentioned, based on the viewpoint of designing “successful” e-Learning.

Section 2 Design of e-Learning culture

Rosenberg (2001) points out that a strong learning culture is indispensable to letting e-Learning penetrate into the organization and stay. He maintains, "It's not just a climate that supports classroom learning or e-learning, but one that embraces learning as a whole-as an important activity of everyone in the firm." (pp. 180). He summarizes characteristics of a learning culture that don't work and those of one that work as shown in Figure 6-3.

Figure 6-3: Culture-building strategies that don't work and one that work (Rosenberg, 2001)

<Culture-Building Strategies That Don't Work>

1. Give customers what they want. Giving customers what they want may not necessarily be giving them what they need.
2. Create and distribute a robust course catalog. The robustness symbolizes wasteful duplication.
3. Think of training as just another product and sell it. Instead of hiring instructional designers, they hire salespeople.
→ The focus is in increasing training activity, a business model which depends on the number of course participants and course fee revenue.
4. Make training "free" It is usually accompanied by little in the way of direction on who takes what. Time is wasted by carrying out unnecessary training.
5. Build competency models ... but don't actually use them.
6. Call yourself a "corporate university." It's just changing name.
7. Move everything to technology. If they think that demolition of classroom means victory, they are too optimistic.
8. Mandate training. It creates a resentful culture rather than a learning culture.

<Culture-Building Strategies That Do Work>

1. Make the coach or the direct manager accountable for learning. Consultation and advice are provided when needed.
2. Focus at the enterprise level. Achieve quantity; integration of HRD and the training department.
3. Integrate learning directly into work. Make e-learning (and other forms of learning) a part of everyone's daily work activities.
4. Design well and certify where appropriate. Making index; and sense of achievement.
5. Pay for knowledge. Reward system for provision of expert knowledge, etc.
6. Everyone's a teacher. Creation of "Culture of teaching" in which employees feel that it is their duty to teach other employees.
7. Get rid of the training noise. Stop using jargon, making the material easy to understand.
8. Eliminate the ability to pay as a gatekeeper. Target a more equal share of training opportunities where the business is weak.

9. Make access as easy as possible. Provide good links which do not require searching. Expand opportunity by providing PCs, etc.

Note: The main text of Rosenberg, 2001, pp. 181-189, is summarized in the table above

When you look at what Rosenberg (2001) points out, the image he gives is the learning culture in which learning will succeed without doubt, making you think “I would be happy to work for such a company.” On the other hand, someone might say, “Such a company is ideal, but far from reality.” Although there is an intensified move toward having a CLO (Chief Learning Officer) so that the top management can take responsibility for learning, including learning culture in the organization as a whole. On the other hand, I can hear people mourning, “We are not given authority to do that much.” Although the possibility of bringing it into practice differs from place to place, I hope you now have an image of successful e-Learning.

Section 3 Design of e-Learning system

E-Learning system means “broadly-defined e-Learning” as defined by Katori (2001). It means to design the whole system (Figure 6-2) which includes such elements as not only the training course via network (i.e., narrowly-defined e-Learning) for “learn from training,” but also the knowledge management system (KMS) in which people “learn from information” and the performance support system (PSS) in which people “learn from experience,” as well as establishment of an e-Learning community in which people “learn from interaction with other learners.”

When you design an e-Learning system, it is important to set the direction toward “lessening the load of the training as much as possible.” In other words, as Rosenberg (2002) points out, you should replace the conventional training with KMS in such areas where provision of information is good enough to achieve the purpose. If you can solve work-related problems by job aids, you should limit the training to a minimum length that is necessary for learning how to use the job aids. Such is the direction you must take to move away from the conventional frame of mind which considers training to be the center of everything.

On the other hand, if the “Training Department,” as an independent organization, just looks at its area of responsibility in such a manner as it has been before, to consider options other than training would mean “an action of suicide,” because such proposition might lead to contraction of the department. For example, even if they know that the manual is faulty, instead of advising the department in charge to revise the manual, they develop the curriculum to train engineers so that they can cope with such a hard-to-understand manual. If you keep doing things like this, you will never make your organization efficient as a whole.

The expertise of ID held (or should be held) by the department which has conventionally been in charge of training is indispensable to work out to identify in what areas the training can be replaced with other means. It is also important to think how you can change the method of training in such a way that the training can be coordinated well with the whole at the system level. For this reason, there is a trend in which the area of responsibility for instructional designers is becoming wider and wider. In addition, to take advantage of its expertise, departments are required to review their duties and interdepartmental cooperation.

System level components include hardware (PCs, network environment, peripheral devices,

learning spaces, etc.), as well as software (LMS, LCMS, information search, information sharing etc.) to implement e-Learning, and the status of development and accessibility of the learning information. You must cooperate with the department that is in charge of information systems and manages the network, etc.

Consideration at the system level is also required for on-line training. This involves such work as calculation of the total learning hours, preparation of a suitable server environment, provision of support staff, and determining concrete specifications for offering the courses. Such factors include whether the system and the course should be developed by the company itself, how many courses are required, and by when it is required. Other items for consideration include whether the learning space should be concentration type or dispersion type, development of required equipment and the load on the network environment, how to manage the progress of learning, and the design of learning time. To decide these policies, you must cooperate with the Personnel Department.

The design of e-Learning systems proposed above assumes organizational change. However, is there anything the Training Department can do when there is no change of organization or administrative authority? There are two things you can do straightaway. One of them is to make a proposal. You can analyze your own duties, discuss what can be done by means other than training, then propose, in such way that you indicate your new role in the system, what kind of organization is required to implement that, and what kind of resources should be given to the Training Department. As it is natural to think that no other departments possess such expertise to prepare this kind of proposal, you have to realize that it is your responsibility to make sure that you have such expertise.

The other thing is to review the content and methods of the training (you should be able to do this within your current job specification). Review the training you are currently offering from such perspective as “lessening the load of training” while looking at other elements of the e-Learning system. You simulate “if we are to lessen the load, what can we remove from the training?” regardless of whether you actually remove it or not. As a result, for example, you might come up with an idea, “Rather than providing training to make them become able to cope with the hard-to-understand manual, let us set our training objective to make them become able to revise that manual and utilize it as PSS.”

Alternatively, acceptable responses are, “Since this field keeps changing all the time, rather than we carrying out training to make them understand what the changes are, let us, the Training Department, launch a new Web site to post change-related information and make it our training objective to make them have the necessary skills to use it.” or “Since they have an opportunity to get together face-to-face for training, let us re-design the course in such a way that participants exchange information regarding what is happening on the floor, while cutting down the time for one-way communication of information by distributing printed materials in advance. Let us also take this opportunity to provide a discussion board and let the content of training include how to use it so that they can exchange information with each other even after the training course.” If you think what you can do even within your current administrative authority, you will see that a variety of innovations are possible. It is important that you keep every possible element of innovation inside your head regardless of whether or not it is within your authority; for one thing, not to lose track of that direction.

The details of e-Learning system building will be discussed in Chapter 7.

Section 4 Design of e-Learning course

“e-Learning course” means on-line training for “learn from training,” which corresponds to the “narrowly-defined e-Learning” mentioned by Katori (2001). The components of the course to put the on-line training in practice include the quantity and quality or diversity of the curriculum which is made available for e-Learning materials, and the support system such as mentors and facilitators.

When it is decided that an e-Learning course is needed, you start to actually prepare e-Learning materials. At this stage, you should keep in mind, as stressed in the previous section, that you try to incorporate elements other than e-Learning courses as much as possible. Naturally, the e-Learning course you design should be different depending on whether you design the course within a well-developed e-Learning system, or whether the e-Learning system is not available or not well-developed. It is best to try to incorporate, based on the availability of other learning resources related to the course you are going to design, as many elements as possible of the system which is already there, rather than design a self-contained e-Learning course. You are required to do your best, by preparing just minimum essential functions, not to unnecessarily increase the dependency on the e-Learning courses.

In terms of the techniques of e-Learning course design, as they have been the focus of conventional ID, a variety of ideas have been accumulated or proposed. The minimum criteria is that what trainees will be able to do upon completion of the course (exit) and what are necessary conditions to start the course (entrance) are clearly shown for every e-Learning course. In other words, you should try not to let learners waste their time by taking an unnecessary course. Clearly show who the targets of the course are, what will be taught in the course, and make the “pretest” available so that prospective trainees can check whether or not the course is necessary for them to learn. Please refer to Chapter 3 for management of the in-out doorway.

Whereas there are e-Learning courses that can be finished in a short time, there are others which take a relatively long time. Different techniques have been proposed depending on the nature of the unit (largeness of the chunk) you design. The design for a certain learning objective is called “micro” design, which produces a short unit of instruction as its result. On the other hand, the design for a number of learning objectives is called “macro” design, which designs how to arrange multiple units of instruction, or how to work out the introduction to the whole course or a summary of it. Different from the techniques on how to manage the ID processes using systems approach (ID process model), these techniques have been proposed as so-called ID model/theory, which draws a blueprint in terms of “What should we teach to make the course most effective, efficient, and appealing?” These techniques are divided into three for the sake of convenience and discussed in detail in Chapters 8, 9 and 10 in this book. Please look forward to it.

Section 5 Design of usability

6-5-1: Easy to use vs. easy to learn

One of the factors to decide the quality of the e-Learning course is the question of whether the material is “easy to use.” This is called “usability.” The study of usability has accumulated a range of know-how for the benefit of the users during the development of computer software. This area is also called study of “user interface.” It is useful to make the display easy to see, make the function easy to use, or develop the manual or the help function which users can look up when they do not understand something.

Those elements which are the objects of usability design include display layout that is comfortable to see and easy to understand, navigation design, color scheme and utilization of appropriate media, and access time. Common tasks to make the material easy to use are to make sure that the material is friendly, that the users can understand what they can do by using the material, that the method of use is clearly shown, and there is a means of help when they are in trouble.

Although the purpose of usability is to make the material comfortable and easy to use, having good usability does not necessarily make the material “easy-to-learn.” Here is the reason why I feel it very unfortunate that people misunderstand that the main job of the instructional designer is display layout, navigation, and so on, at the usability level. Although, because of the connotation of the word “design,” it cannot be helped that people think that our job is something similar to a “visual/graphic designer” or an “artist,” the mainstay of the instructional designer lies in the know-how which helps achieve “easy-to-learn” rather than “easy-to-use” materials, and materials which stimulate “users’ motivation” rather than materials which “look good.”

However, if the material is NOT easy to use, it cannot be helped that the material becomes difficult to learn. We can utilize the know-how of usability study to make it easy-to-use. Avoid such situation as you have to first of all spend a lot of time to remove the uneasiness so that the learners can concentrate on learning. In the remainder of this section, I would like to discuss the requirement for “easy-to-use,” as a prerequisite for making it “easy-to-learn.”

6-5-2: Results of usability study

According to Nielsen (1993), the leading authority in the study of usability, usability has five aspects as shown in Figure 6-4.

Figure 6-4: Five aspects of usability (Nielsen, 1993)

| | |
|------------------|---|
| (1) Learnability | The system should be easy to learn so that the user can rapidly start getting some work done with the system. |
| (2) Efficiency | The system should be efficient to use, so that once the user has learned the system, a high level of productivity is possible. |
| (3) Memorability | The system should be easy to remember, so that the casual user is able to return to the system after some period of not having used it, without having to learn everything all over again. |
| (4) Errors | The system should have a low error rate, so that users make few errors during the use of the system, and so that if they do make errors they can easily recover from them. Further, catastrophic errors must not occur. |
| (5) Satisfaction | The system should be pleasant to use, so that users are subjectively satisfied when using it; they like it. |

Everyone has an experience of trouble of which he/she does not know how to use computer software when he/she tries to use it. Often, you do not know when and which one to use, because there are so many “functions” available. There is a catch that you are too busy spending a lot of time on learning how to use the software to worry about whether you are doing your job more efficiently by using that software. Trying to improve usability means that you do care about the users. I would like to introduce some of the results of the usability study to help shape your material so that the users don’t feel uncomfortable and start to concentrate on their study straightaway.

Figure 6-5 is the summary of the components of printed material and things you can change based on the usability study and Kaiho’s (1992) cognitive expression research (Suzuki, 1994).

Figure 6-5: Components of material: What you can change

| | |
|--------|---|
| Text | Font, size, emphasis, space between characters, space between lines, number of characters in a line, percentage of <i>Kanji</i> , length of the sentence (standard length is 30 or fewer Japanese characters in one sentence), structure of the sentence (simple sentence/complex sentence, negative, passive voice, etc.), difficulty of expression (reference terms, paraphrasing, conjunctions, etc.), paragraph structure, etc. |
| Image | Chart (structure of information, visualization of figures), graph (generally speaking, line graph for change and bar graph for comparison), photo and illustration (feeling of reality and elliptical expression; i.e. emphasizing a part), how to insert captions, etc. |
| Layout | Ratio of printed area (the ratio of the area in which characters are written to the whole area of the paper; standard is around 60%), space ratio (the ratio of the area in which characters and images are actually printed to the printable area), column setting of the text information, location of image related to the text, etc. |

Note: Suzuki (1994) is summarized in the table above

Much of the know-how for the printed material described above can be applied to the display design of e-Learning material. In addition, in case of multimedia, you need to also pay attention to the way links are provided, visual effect when moving from screen to screen, or the way the phonetic information is used. The key points to improve readability and understandability, based on the research results, are listed in Figure 6-6 and Figure 6-7. To improve understandability, it is necessary to take into account, in addition to readability, what you want to make understandable to whom; i.e., the content factor as well as the reader factor. Coming up to this stage, we are getting fairly close to ID (design of learnability).

Figure 6-6: Keys to readability (Suzuki, 1994)

| Key points to improve readability | |
|-----------------------------------|--|
| Text | <ul style="list-style-type: none"> • Determine the text size in accordance with the viewing distance. Whereas the appropriate type size for a book is, assuming the viewing distance is 40 cm, about 3 mm high (9 points), the appropriate text size displayed on a TV screen is, assuming the viewing distance is 2 m, about 1.6 cm high. • Use large size for text that you want the viewers to understand instantly when they see them, or if the placement is important. Consider the contrast with other text in terms of size, darkness, and font type (text jump ratio). When the jump ratio is high, contrast is emphasized. • To hierarchically structuralize the information, change the font, and use figures (chapter, section, item, etc.) and indent (line starting position). However, you have to be careful because, if the hierarchical structure is set too deep, the reader might be confused. • Try to make eye movement stable and limit it within a short distance. Keep the number of characters in one line smaller and arrange the text in such a way that the arrangement does not go outside the reader's anticipation (indent, etc). One way to effectively stabilize the eye movement is to use a vertical ruler at the beginning of the line. |
| Image | <ul style="list-style-type: none"> • The three roles for charts and illustrations are to sum up, to emphasize, and to make them instinctually understood. • Generally speaking, readers tend to prefer detailed drawings or photographs rather than line drawings. Dynamic drawings rather than static drawings are preferred. However, drawing the image in more detail does not necessarily increase the effectiveness of the learning. • If the picture is too detailed, this gets in the way of understanding the content. In this sense, a black and white photo rather than color, an illustration rather than a photograph, or a simple drawing rather than a detailed drawing is easier to see. • When you design, consider the eye movement of the readers. Don't use legends (explanatory note of symbols and characters). Instead, it is recommended that you write the text information, required to help understand the drawing, directly in the drawing. • For title of a chart, choose appropriate words which indicate the content so that the reader can understand the reason why the chart is used. Don't forget to mention the chart in the main text. |
| Layout | <ul style="list-style-type: none"> • Layout determines readability and the feeling when looked at (the first impression), guides the eye movement (eyeball movement) during reading, and tells the importance and type of the content. • Use appropriate paper size depending on the purpose. The paper size limits many attributes, including number of lines and number of characters in a line. Consider folding it in two or even four so that the paper size fits the amount of information that should be viewed at a glance. • To make it look neat and tidy, increase the amount of space (empty area) and limit the variety of the font types so that it has a uniform format/design as a whole. • To ensure stability of the arrangement, place the accent at the center of the printed area, make the center of gravity placed a little bit towards the bottom right, and try to work out a good left/right and top/bottom balance. |

Note: Suzuki (1994) is summarized in the table above

Figure 6-7: Keys to understandability (Suzuki, 1994)

| Key points to improve readability | |
|-----------------------------------|--|
| Text | <ul style="list-style-type: none"> • Adjust the concreteness/abstractness level in accordance with the reader and the content. If the readers are unknowledgeable, or you want to convey detailed information to knowledgeable readers, the more concrete, the more understandable. On the other hand, if the readers are knowledgeable, or you want to convey just a rough image to unknowledgeable readers, the more abstract, the better. • Use concrete examples, parables, metaphors, etc., taking advantage of readers' knowledge and/or interests which they already have. • Numbering is effective when used to express the separation or cohesiveness of the information, chronological order, hierarchy, and number of elements. However, when used for mere replacement purpose such as in multiple-choice, for example, it works the other way, making it hard to understand. |
| Image | <ul style="list-style-type: none"> • Arrows are effective to express location, chronological change, movement, and logical expansion. However, if you use many arrows to guide the line of sight of the readers toward multiple directions at the same time, it becomes confusing. Basically, the directions of arrows should be from top to bottom and left to right. • Use photographs, illustrations, and pictographs (a graph in which quantity is expressed by the size of the picture) to let images take shape. • Imagine the readers' point of view to coordinate the order of reading with the explanation number, direction of observation with the direction to which an explanation drawing is drawn, and the size of an illustration with the size of actual thing, etc. |
| Layout | <ul style="list-style-type: none"> • To emphasize differences or changes, make the reader able to see two contrasting things (two charts, for example) at the same time. • Arrange the information in such a way that cohesive information is displayed together. Examples of layout in which the designer pays little attention to the content include those in which the heading is shown on a separate page from the main text, a reference chart is shown far away from the main text, and a chart is shown striding across two pages. |

Note: Suzuki (1994) is summarized in the table above.

Having good usability is a necessary condition to ensure evaluation at the user's "Reaction" (i.e., Kirkpatrick's Level 1 evaluation). If the user cannot wait during the access time, no matter how crisp the image you provide, the effect is just the opposite, because they would get more frustrated with "waiting time." You should try to maintain the quality of screen design at such a level as it is good enough to remove the negative factors at the "Reaction" level.

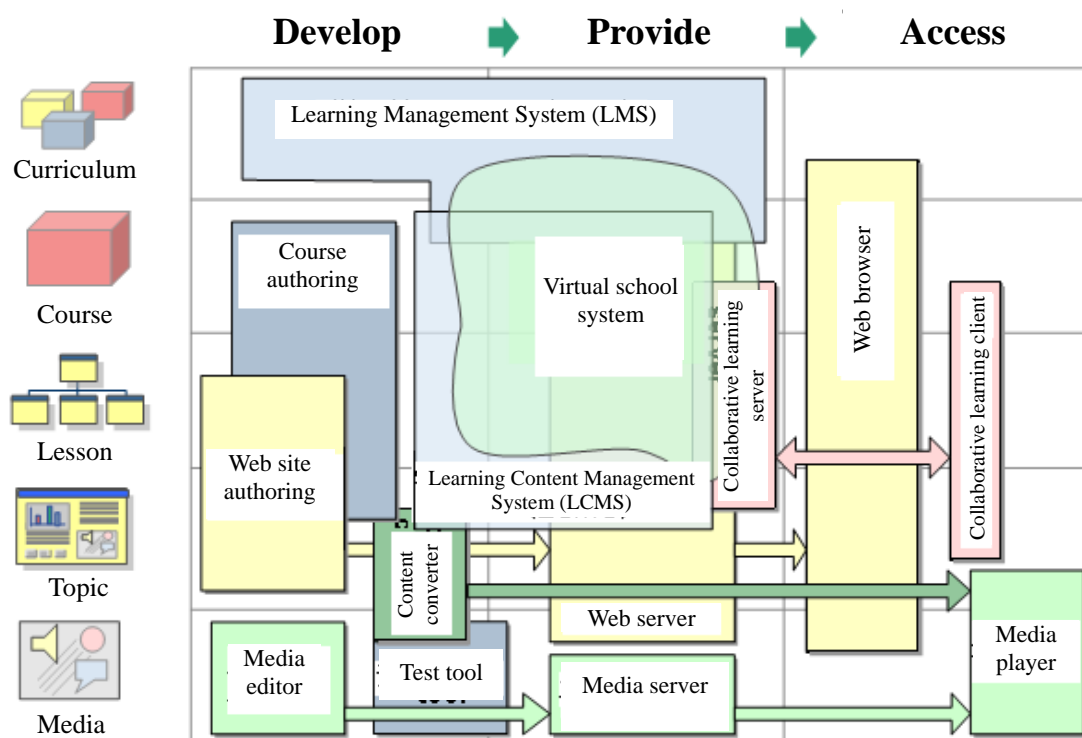
On the other hand, even if the material is easy to use, you should think that this has nothing to do with whether the material is effective at the "Learning" level (i.e., Kirkpatrick's Level 2 evaluation). If the design at the higher level has not been done well, no matter how "pretty" the material you develop, you cannot expect effective learning. So long as ID stays at the screen design and usability, effective materials cannot be developed. Herein lies the reason why ID does not just mean design of outward appearance.

(Note: If you feel uncomfortable with this remark, please be patient with me, by thinking that this remark is a reflection of my over-sensitivity toward visual design, as I am neither gifted nor trained in that field. In my opinion, an instructional designer such as me must always work together with a specialist of visual design. Alternatively, I think that if someone who has skills in visual design, learned skills of instructional design as well, he/she would make a powerful designer, playing a double role.)

Section 6 Design elements and tools (Horton’s sketch)

Horton’s (2002) sketch provides a clear image of the tools which are required for the design at each level. See Figure 6-8 for “There are tools for every level and task,” one of the presentation materials which are made publicly available on the Web site by William Horton.

The horizontal axis consists of three kinds of work related to e-Learning material, “Develop,” “Provide,” and “Access,” and the vertical axis consists of five levels, curriculum, course, lesson, topic, and media (all the parts which constitute the screen display). The sketch shows all the tools available for each kind of work at each level. (Note: I had an opportunity to listen to the presentation by Horton at ASTD TechKnowledge2003, which is mentioned in the preface. It was superb really, making one feel, ‘No wonder that he is a professional!’)



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Note: This is created using the reference material available on William Horton’s Web site (<http://www.horton.com>)

Source: Horton, W., & Horton, K. (2003). *E-learning tools and technologies: A consumer's guide for trainers, teachers, educators, and instructional designers*, Wiley, p.31. [Available online] <http://www.horton.com/html/elthandouts.aspx> (13th slide on Page 7), last visited on 2008/11/10.

Figure 6-8: Tools for every level and task (Horton & Horton, 2003)

Section 7 Design of the process of change

The last item you can design to make successful e-Learning is “design of the process of change.” When you start something new, even if that is a wonderful thing, you need to work out how to persuade people, and how to implement the change without bringing out a feeling of alarm about the change from old to new among those who are involved. As a professionals, whose job is to support other people’s learning, we should also look at the way of changing the mind of the people who are reluctant with change (this is to support the learning of a positive attitude) and how to communicate what kind of information to eliminate the anxiety for new things (to support the learning of knowledge and/or skill).

When we design the process of change, the following comparison is helpful. They say that there are differences, as shown in Figure 6-9, between the patterns that go well and those that do not. You should check the solution thoroughly before you actually implement it to avoid such mishap, where the implementation of a solution to solve a certain problem creates a new problem. One of the important steps to the successful e-Learning is to thoroughly examine what kinds of problems the solution called e-Learning can solve and what kinds of new problems it might create.

Figure 6-9: Comparison of process of change (Rothwell & Kazanas, 1998)

■ Pattern of change which does not go well ■

- Step 1: We have a problem.
- Step 2: We search for a solution, and having identified a solution.
- Step 3: We implement it.

■ Pattern of change which goes well ■

- Step 1: We have a problem or can anticipate one before it manifests itself.
- Step 2: We search for a solution while trying to find out if any conditions presently affecting the problem will change in the future.
- Step 3: We tentatively identify a solution and consider how future changes in the organization's environment or in the organization itself may affect it.
- Step 4: We play a game called "If ... what" (If we implement the solution, what is likely to happen?).
- Step 5: We step back into the present and modify the solution to avert or minimize the negative side effects that we expect will arise during implementation.
- Step 6: We implement the solution.
- Step 7: We follow up continuously to ensure that the solution works as expected as the future unfolds.

Note: Rothwell & Kazanas (1998) p.370 is summarized in the table above.

The findings of research which are helpful to design the process of change are summarized in “study of diffusion” (diffusion of innovation) (Rogers, 1990; 1992). Innovation means matters, things, or patterns of behavior that we consider “new.” Research has found what kinds of characteristics of the innovation make the diffusion process easy (or it positions itself in such way that the diffusion process happens easily), or people having what kinds of characteristics tend to accept (or resist) new things. When you start e-Learning for the first time, you can better design its process as a diffusion process of the innovation (i.e., e-Learning).

The findings of Rogers’ study on diffusion have been utilized in a variety of fields. In particular, often made reference to is his five factors: (1) simplicity/easiness [whether it is easy to do], (2) relative advantage [how it is better than others], (3) compatibility [whether or not it is a taboo], (4) observability [whether it is easily noticed by others], and (5) triability [whether it is possible to try a little bit]. Rogers has also distilled categorization of adopters (innovators, opinion leaders, early majority, late majority, and laggards). There are many useful findings you can refer to when you design the process of change in relation to such things as: (1) how to make visible those aspects that are difficult to diffuse (i.e. positioning) in your design based on a good understanding of the characteristics of what you want to diffuse; (2) employing a strategy to send the innovation message to the opinion leaders who, although they tend to think carefully before they adopt to new things, are influential on forming informal opinion, rather than to those innovators who, although they tend to adopt to new things immediately, do not have much influence over the organization; or (3) how to design the pressure (social pressure) from other members of the organization to take in the conservatives who take a long time before they adopt the innovation.

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| | End of chapter report assignment (Chapter 6) | |
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Write a report on one or more of the following three assignments:

- 1) Summarize your questions, comments, opinions and impressions you had after reading through this chapter (Chapter 6). In addition, if you have any experience, additional information, or have conducted research (do not forget to name the source) in relation to what is written in this chapter, you are encouraged to include them in your report so that you can extend your understanding even further.
- 2) Analyze the “e-Learning culture” of the organization you belong to with reference to Figure 6-3. You are also encouraged to mention things you can do to bring about the change for better.
- 3) Analyze the relationship between the duty (range of work) and the elements you can design in relation to the examples of e-Learning which you are involved in. In this chapter, e-Learning design at various levels is discussed. However, not all people can control everything. On the one hand, depending on your job description, there are many things which you have to give up because they are “outside the design area.” On the other hand, it is also important, when you think what you can do within your range of work, to work out the strategy how to extend the influence over the whole organization. Discuss, based on above perspective, what you are doing now, what you might possibly be doing in the future, and what sort of things, even if you cannot do them directly, you could get involved in doing. In addition, not limited to e-Learning examples, you are also encouraged to analyze your experience in terms of how you have been educated at school and at the company or educational activities you are doing now.