

Training Development

Standards – The Key To Success

Summary

Effective training is a product of great educational design. The very best teaching and technology will not transform inadequate training material. Standards are important in the traditional course development process but, for those producing technology-based training solutions in particular, they are essential. A standards manual should be used in any training development environment. It should aid course development in terms of both quality and productivity. If course materials are not being built using documented and approved guidelines, the resulting overheads in updating and maintaining training products can quickly become unacceptable.

Introduction

The aims of this paper are threefold. First it outlines the processes involved in the design and development of effective training packages. In other words, it gives guidance on the steps you might wish to take to plan and build good blended training material. Secondly, it discusses the issue of why standards should be adopted throughout the training design and development activity. It is important to understand why these standards are necessary and how they can contribute towards an organisation's overall goals. Finally, it aims to identify a list of contents for a typical training development standards manual. These most commonly take the form of procedural guidelines, statements of authority and responsibility, and performance aids for the use of course authors. All of these elements are necessary if we are to describe a cost-effective and educationally effective method of producing blended training material.

The design and development process

For a number of years the systems approach to software design and production has been applied in the industrial training arena, and specifically to technology based training since the late 1970's. The approach has been recognised as a necessity for large-scale commercial training projects where solutions are derived from learning objectives which themselves are a subset of corporate targets and goals.

The adoption of what is a very rigorous process has given rise to specialists who are typically skilled in such diverse disciplines as educational psychology, organisation analysis, and software design and production. The absence of staff with appropriate skills has in many cases led to condemnation of blended training material by users and user organisations. In such instances the technique has been condemned because of the poor quality of the finished product, rather than because the idea of using a blended product in the first place was badly founded.

So, if these specialists are worth their salt, what is it that they do? To find out, the design and development process needs to be examined in more detail.

Stage 1: Analysis and initial training system design

Typically, this stage has to be carried out by an experienced trainer who has the business acumen to consider the costs and benefits of a training system to an organisation as a whole.

The initial discussions between a training specialist and the owners of the problem will allow the trainer to formulate, at least in part, an answer to the following questions:

1. What should the overall objective of the training system be and how is this related to the organisation's strategic goal?
2. Who are the subject matter experts? That is, who are the people who know most about the knowledge and skills required to perform the tasks which are the subject of the training system? In the case of existing jobs, these may be the individuals who actually perform the tasks. Where new jobs are involved, they may be the systems designer or management services personnel who have the responsibility for implementing new working practices.
3. What is the target group of trainees? Where are they sited, what is their average academic standard, age, profile, and so on?

If the training specialist can answer these three questions he can then conduct a systematic search of relevant documentation and literature, and talk directly to those who know most about the desired level of trainee performance, to distil a list of objectives which make up the analytical framework of the training system itself.

For completeness and, more importantly, to aid the later work on training materials design, the objectives are usually stated in three parts, as follows:

1. *Conditions*: the conditions under which the trainee is expected to achieve the objective, for example 'with the aid of an IBM AS400 terminal and a completed company application form'.
2. *Performance*: the discreet element of job performance required of the trainee, for example 'the trainee enrolls a new employee onto the company payroll system'.
3. *Standards*: the measure which is applied to determine whether or not the trainee can demonstrate mastery of the desired level of performance, for example 'correctly, within the time limit of two minutes'

The complete training objective in this instant would therefore read: 'with the aid of an IBM AS400 terminal and a completed company application form, the trainee enrolls a new employee onto the company payroll system, correctly within a time limit of two minutes'.

This might seem to be a tortuous process for the synthesis of just one of the many training objectives that will constitute a complete training system. However, it does give a complete and accurate picture of the expected performance level of the trainee. This is essential if the objectives are to be tested in some way on completion of the training package. Indeed, the precise nature of the objective will give the instructional designer valuable clues about the best training delivery medium to match that particular training objective. A video or lecture-based presentation is likely to be poor choice in this

instance; to give the trainee the best chance of mastering the new skills and knowledge that will be necessary to achieve the objective, he must ideally have access to an IBM AS400 terminal, he must see a real company application form and he must be able to get some feedback on how quickly he can complete the task. On the other hand, computer based training (CBT) might be an ideal method of training delivery, particularly where the same type of terminal is used to provide the training. A CBT system can then be used to give feedback and repetition where it is needed.

This process of matching the delivery medium with a training objective is a crucial part of the analysis and initial design phase. It is to some extent a subjective process, although educational psychologists, notably Gagne, have attempted to produce matrix-based tools to aid the process.

The matching of objective and delivery medium is done after the objectives have been synthesised into a modular course structure. The detail of this stage involves the arrangement of training objectives into a hierarchical format. Subordinate objectives which are prerequisites of a particular task are linked to the objective describing that task. This defines the interrelationship of all the objectives in the system. At the top of this pyramid structure will be the overall or 'terminal' objective. The logical arrangement of objectives allows the training specialist to adopt a modular solution, where the individual modules have the following characteristics:

- They contain learning objectives of a similar level of difficulty
- They contain objectives which are most likely to be ideally deliverable by one particular training medium (text, multimedia slide/tape, lecture, interactive video, group-based tuition etc.) This is because of their location in the hierarchy and their position relative to their own subordinate and superior objective.
- They represent an easily assimilable portion of learning material; that is, not too lengthy for the average trainee.

Given the modular structure and the selection of delivery media for the modules, the next step involves costing the entire blended solution and, if necessary, cost justifying the training system against other, perhaps more traditional, methods of delivery.

It is normally the case that an organisation is accustomed to providing training via lectures and group studies at a central location. Many trainers see this as 'the way we've always done it – and why change now..... After all, the use of computers in training is just a gimmick.... Remember, the debacle of the teaching machines in the 1960's.....'.

This sort of argument may be familiar to you. However, it is misguided and lacks the benefit of professional scrutiny. The truth is that the use of the computer as a training delivery tool and manager of the learning process can be effective in both cost and educational terms.

In terms of educational effectiveness, blended training has proved to be more effective than traditional lecture-based alternatives.

The training industry has now seen many examples of clients who have been astonished by the savings that can be made by adopting blended solutions to their training problems. In some cases these have run into millions of pounds, and in many instances it has been money which is not always associated with the training budget that has been saved. For instance, does your organisation pay the cost of travel and subsistence during training courses from the training budget or from a departmental allocation? If it is paid from the budget of the trainee's operational department, then the total out-goings of a large training project can be hidden from those who seek to control training costs. It is in this area where the greatest tangible cost savings are to be gained from a blended approach. Why not use funds for training rather than travelling?

To determine costs and benefits at the analysis and initial design stage, the training specialist will need information on the following:

- Costs of developing and delivering various educational solutions, per hour of course material
- Numbers of trainees involved
- The organisation's travel and subsistence policy
- Average salary costs of trainees and trainers
- Costs of any hardware or software tools required
- The geographical distribution of the trainee target group.

Completion of the costing study, along with consideration of any inherent constraints (eg budget, hardware type), brings the initial analysis and design phase to a conclusion. At this point a decision can be made on whether to continue with the following stages of detailed instructional design and training development.

Stage 2: Detailed instructional design and material development

The systems approach is relevant at this stage too, and results in the following activities:

- The implementation of a professional approach to project planning by dividing the design and development task into stages. These can be properly controlled and monitored by allocating individual responsibility and accountability for the tasks and subtasks which make up the whole process
- The organisation and re-sourcing of teams with the appropriate skills to tackle various components of the design and development task
- Written communication between team members throughout the work, with regular reviews and evaluation to avoid costly delays and inappropriate specifications.

Part of this stage requires a very detailed examination of the house style that is to be adopted. Perhaps it would be useful here to differentiate between standards and house style.

Training programme production might *adopt* a particular standard. They might choose, from currently published material, those procedures and guidelines which they feel are most likely to aid them in the cost-effective and educationally effective production of materials. These standards can be used in all situations and under all sets of

circumstances related to course analysis, design and development. A standard is *definitive* in the broadest sense.

House style is simply a set of *maxims* that are adhered to during the design and development process. They are most likely to consist of examples of preferred text or layouts, preferences on writing styles, detailed documentation formats and performance aids that are specific to one locality or project culture, for example, the choice of authoring system may well determine the exact nature of parts of the design documentation that should be set up as a 'standard'. A typical example of pure house style would be the use of a company logo in the materials. House style is therefore a practical manifestation of the adopted standard.

Completion of the detailed instructional design task might include the following jobs:

- Specifying course content relative to each of the training objectives that were agreed during the analysis stage
- Completing layouts for text, visual aids and technology based components (information, questions, menus etc)
- Specification for relaying instructions to the student on how to control the course and the interaction of various delivery media
- Definition of module/course/topic/unit numbering conventions
- Specification of routing according to educational requirements and trainee type
- Setting up evaluation and user feedback mechanisms
- Specification of student and author records requirements and required hard copy reports
- Deciding on the use of pre-tests and post-tests and determining mastery criteria
- Deciding what levels of feedback should be given and to what extent

Completion of these jobs will lead to the use of specific standards and the development of a specific house style in any large scale training project. The end of the design phase is a suitable point for the user to sign off a complete specification of the training system that is to be produced.

The final development stage of the training solution will require answers to the following questions:

- Which text fonts, styles and sizes should be used in the production of any printed material?
- What sizes and colours and fonts should be used and how will the different types of learning material, such as written information, questions, menus, feedback and instructions, be characterised?
- What line spacing should be used? Is there a guideline about how many lines or words should appear in any one page of information?
- If an authoring language is to be used, what conventions are necessary to ensure that the training software is easily maintainable? How should the code be structured? How and where is essential information, such as variables and variable tables, stored?

- What are the most appropriate back-up procedures to protect your training software?
- What is the convention for identifying different versions of material? How are the versions controlled, distributed and updated?
- What testing techniques will be used to test the course specification before it goes out to the consumer.

Again, the answers to these questions will yield more maxims related to house style and standards.

If we regard training analysis, design and development as a continuum then we can chart the extent to which a raw standard gives rise to general-purpose tools at the analytical end of the continuum, as opposed to detailed formats for material, which are specific to the project, home produced and more specifically related to the production/evaluation end of the continuum (see figure 1).

All of these general-purpose tools, and the home-produced detail, might constitute a training standards manual. We will look at possible contents of the manual in the final part of the paper.

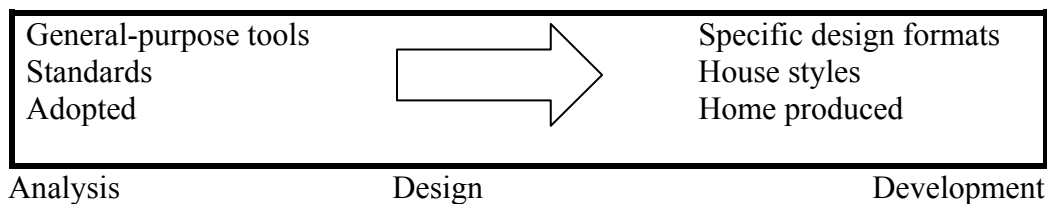


Figure 1: The training analysis, design, and development continuum

Why do we need standards?

In recent years companies have become increasingly aware of the benefits that blended training can provide within their own environments. Lower variable costs associated with trainee travel and accommodation charges, and reduced disruption where users have branches or outlets distributed nationwide have been the key reasons why large investments have been made in the technique.

From a purely financial point of view, investment in training can be considered in exactly the same way as investment in any other high-tech venture. The fixed costs associated with the development of a traditionally run training course are comparatively low. The average development ratio for lecture-based courses is something around 25:1. That is, it would take the average trainer 25 hours to produce a one-hour training course for delivery in the classroom. However, the variable costs associated with this type of training solution can be very high indeed (see Figure 2).

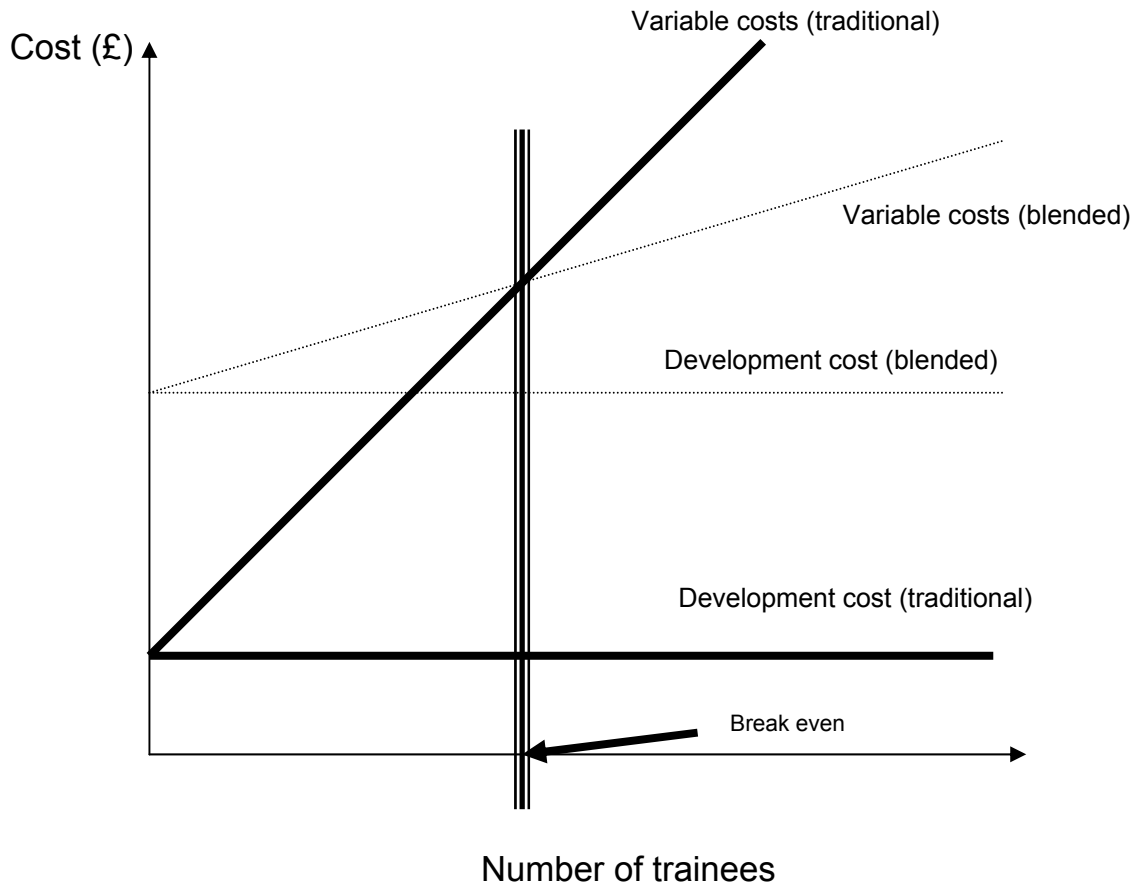


Figure 2: Comparison of development and variable costs in training

A good, blended solution is likely to have the opposite set of characteristics. Experience has suggested that the fixed development costs of a blended training project can also be very high. Ratios of 150:1 are quite common for the development of such materials. However, the variable costs are often much lower than in the case of traditional training solution. This means that where there are large numbers of trainees required to take a particular course, the aggregate of the fixed and variable costs may be lower for blended training than for traditional lecture-based approaches. The break-even point is often as low as 100 to 150 trainees.

If we can accept that blended training projects can be justified financially as well as from the point of view of training quality, then we might start to ask ourselves how we can help to further reduce the development costs and running costs of these projects, and at the same time, ensure consistency and professionalism in our training products. The argument is that we can do this by introducing standards into the design and development process, which will have the effect of reducing overall development ratios and provide the educational integrity and quality which good blended training must adhere to if it is to be a successful technique in the long term

Of course, one of the benefits of blended, modular materials is the trainer's ability to update materials very rapidly, with centralised control and subsequent consistency in the education that is delivered to the trainees. Here again, this process involves a cost, which is most often covered by the maintenance budget.

The need for standards can therefore be summarised under three main headings:

1. To reduce design and development costs.
2. To improve quality of training products.
3. To allow easy maintenance and updating of training materials.

Contents of a standards manual

A standards manual is of little use unless its contents are of direct and practical relevance to the functions it aims to standardise. Similarly, the quality of the contents will be useless unless the details of the standards are properly communicated to those who should use them. A regular review mechanism is essential to ensure that standards are being maintained.

The standards manual might therefore include:

- A description of the systems approach to training analysis, design and development
- A description of the training organisation concerned, including those who have responsibility for training implementation and the authority to act at various levels
- Checklists to aid the process of determining the ultimate goal of a training system and its relation to an organisation's strategic aims
- A pro-forma to help identify the characteristics of the trainee target group
- Examples of objectives format and description of the synthesis of objective hierarchies
- Methods of modularising courses – a description of the aims and benefits of this approach with examples
- Performance aids for the selection of appropriate delivery media
- A pro-forma identifying the factors involved in costing training solutions and cost-benefit analysis
- Guidelines on the use of different planning models and the need to adopt a model which has a level of complexity commensurate with the complexity of the project as a whole
- A recommended format for specifying the course content related to each objective
- Suggested layouts for various types of delivery media and example of acceptable standards for each type
- Screen design forms and layout information, questions, menus and instructions in the material
- Pro-forma for specifying student routing according to trainee type
- Descriptions of, and pro-forma for, user feedback and evaluation mechanisms
- Methods of specifying data to be recorded throughout the course for student reference or author use

- Guidelines on the use of student testing mechanisms and acceptable standards of feedback
- Preferred text fonts, styles, sizes and colours for printed or screen-based text
- Programming conventions and structures
- Numbering conventions to be used in the material
- Labelling conventions for different versions of the training products
- Controls for the distribution, updating and copying of material
- Acceptable testing techniques for the training material prior to implementation
- The review process which will ensure that standards are being maintained.

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