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# Quality Measures in Design & Development of e-Learning Content

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## Abstract

In this paper the author reflects on the need to articulate and implement strategies in a way that engage key stakeholders in the e-Learning industry so as to embrace standards, and thus encourage Quality in Content, in order to produce innovative and meaningful learning experiences.

## Keywords:

Quality, e-Learning, e-Learning Standards, Content Design, Quality in e-Learning Content, e-Learning Content, Quality in Content

## 1. Introduction

*When learning solutions meet their objectives, they create a stimulating, thought evoking experience, which can deliver enormous efficiency and effectiveness in an organization.*

e-Learning is not just another facet of learning. It is a whole new opportunity. In fact, the possibilities here are no less path-breaking than they have been in the world of business. e-Learning is about re-defining the vision and the scope of the entire gamut of relations between teachers and learners. And the breadth of transformational possibilities is so wide that it promises to rework the entire educational setting of our civilization.

The “e” of Learning no longer stands only for ‘electronic’. It also means *effective*, *expedient* and *efficient*. According to the author, e-Learning can be defined as the appropriate blend of face-to-face traditional learning and information & communication technologies (ICT) to enhance learner-centric, collaborative yet personalized, cost-effective, flexible access to lifelong learning. A good blended solution has the characteristics of a flexible, integrated

instructional design, consistent framework and nomenclature.

e-Learning can greatly increase student retention and satisfaction, as it enables increased human support and interaction between students and instructors through text chat technology, electronic bulletin boards, synchronous content delivery and online tutors, thereby creating a memorable learning experience.

Creating these sorts of learning experiences, which challenge the learners' instincts, requires rigorous understanding of the learner, the unique learning styles, the curriculum, the community of learners, and assessment.

Recognizing the importance of nurturing individual learning requirements, the design capability should be anchored to established learning and development theories and applied by e-Learning professionals with proven commercial experience.

Through the application of suitable instructional design methodology, the development of new design concepts and learning strategies should be encouraged, which ensure a high level of repeatable efficiency and cost effectiveness for the customers.

Hence the focus should be on achieving the training program's learning objectives, without jeopardizing individual learner needs. One should explore and extend the creative possibilities of the digital environment for the advance of innovative online learning experiences. Best practices include use-centered design, knowledge object structure, usability engineering, and formal evaluation.

## 2. Components of e-Learning System

*With continuous learning, delearning and relearning being the order of the day, e-Learning has come to the aid of the new-age knowledge workers.*

The elearning industry has emerged only within the last couple of years, and like many new high-growth industries, it is highly fragmented and populated. It can however be broadly classified into three main categories: Content, Services and Technology. Each of these categories can be studied in depth. But for the purview of this paper, the author will concentrate on Content Design.

Content is one of the most important aspects of e-Learning, since the content's selection, analysis, designs and presentation creates a comprehensive and engaging learning experience.

When content is designed properly, it offers the following advantages:

- Conformance to global e-Learning standards
- Suitability of integration with other vendors' solutions
- Enhanced scalability and usability of content
- Ability to serve diverse learners needs
- Increased reach, flexibility, and quality of learning achieved through greater student access
- Improves students' critical thinking and problem solving skills
- Encourages and improves communication and collaboration among teachers and the taught
- Motivates students to learn and excel by utilizing a real-world approach

The above attributes certainly make e-Learning an exciting proposition for the learner. Imbibing these attributes while designing the Content reflects on the empathy of the trainer for the learners and their learning needs.

Practically, however, e-Learning has not kept pace with the development of complex delivery platforms. Most e-Learning experiences have not taken advantage of collaborative tools and technology. Current online learning technology and courseware present content as though all individuals learn in the same way. The "one size fits all" approach is preventing e-Learning from delivering to its full potential. The omission

Of the consideration of adult learning elements when designing web-based instruction system can impede the successful delivery of instruction via the Internet. The optimum solution combines the best elements of face-to-face training and electronic learning.

In a recent web-based survey on Quality and e-Learning conducted by SRI Consulting Business Intelligence showed that over 60% of all respondents rated the overall quality of e-Learning negatively, as either fair or poor. When asked to rate quality of various e-Learning components (Content, Learning Management Systems, Skills Management Tools, Synchronous Tools, and Learning Content Management Tools) used in their programs, the respondents gave highest quality marks (86%) to "Content". e-Learning content (its courses, modules, or learning objects) has been the subject of much discussion in the debate about quality.

While there are numerous e-Learning solutions available today, the differentiating factors, i.e., the factors which help achieve a far superior learning experience and motivation to learners, are the Innovative Instructional Design and Custom Content Development Process. A good content design should consider the accessibility, clarity, consistency, efficiency, focus, and flexibility of the content. Timely, relevant and game based motivating content ensures success of an e-Learning program.

Content design should move systematically, from structuring the content according to the objectives of the course, towards the learners' goals, using appropriate instructional approach and strategies. In fact, writing objectives is the first step in designing an e-Learning program. Objectives explicitly and precisely state the behavior and the performance expected from a learner at the end of a course. Their aim is to describe specific, measurable and observable behaviors that communicate the intent of the instructional designer and goals of the course.

Communicating plethora of information for starters as well as high end learners, through a common interface, is a complex

job. This is where structuring content is very important. Structuring has two key purposes for the learner, enabling learning and enabling access. This involves chunking of relevant information under suitable titles, according to its complexity and hierarchy, connecting the different parts of a course to form an intuitive content map or information architecture.

Effective content design requires close collaboration of the Trainer, the Instruction Designer, User Interface Designer and Multimedia Artist. Major initial time investment is that of the trainer here, who has to develop his instructions according to the active tools, rather than using passive tools of traditional instructional methodology. If the course has to be interactive, the trainer is the best developer because of his/her familiarity with the course content.

It is appreciable if reusable learning objects (RLOs) are used in designing and creating courseware. Interactive multimedia is both expensive and labour-intensive to create, so it makes sense to share the burden and the cost. The same topics are being taught across multiple institutions, which means that duplication of effort is taking place. If generic and reusable resources could be identified and produced, much time and effort could be spared. By encouraging and engaging educators in the creation and production processes, a sense of collective ownership is engendered, reusability is enhanced and individual subject expertise is valued by the entire community. Expert content is unlocked using a specially designed template that allows teachers to organize their subject matter into a format appropriate for RLO development. These RLOs can then be assembled and dispatched electronically to each participating institute. All these practical activities coupled with rigorous quality assurance methods of peer review and evaluation feeding back into the development lifecycle, make it possible for a range of quality learning objects is being produced and evaluated in practice.

Content developers can reduce development times through the reuse of courseware architecture and significantly reduce the time spent familiarizing

themselves with the target courseware delivery systems. Organizations receive a more flexible and portable product that can be easily moved between different delivery systems without requiring customization, effectively future-proofing the courseware.

From the Usability perspective in relation to Content Design, the following considerations are important:

- Definition of user requirements, task analysis, and workflow engineering
- Development of GUI style guides
- Complete user interface design, including detailed functional analysis
- Prototype development
- Graphic design fully integrated with the application interface
- Expert reviews and usability testing of the interfaces

Summarizing some of the desirable features of a good e-Learning content:

- Extremely interactive and user-friendly
- Self-explanatory visuals
- Troubleshooting made easy
- Supporting audio-video files
- Multiple streaming modes
- Easy navigational features
- Step-wise instructions with animations
- Multipurpose training solution
- Easy maintenance and updation
- Clearly explicit pedagogical design principles appropriate to learner type, needs & context
- Continual Improvement in the above

### 3. Defining Quality in e-Learning

*According to the author, "Seamless integration of all processes to accomplish the objectives of the system is a key to measuring the quality of that system."*

While quality is difficult to define, its importance is universally appreciated. Quality's commercial importance comes from its perceived ability to lower costs, improve commitment of the human resources, and ensure continuous improvement within a dynamic environment. Identifying processes is an important step toward improving them and predicting the consequences of changes. According to

Deming, some 94% of quality problems result from a faulty system.

Quality is made up of many elements. To name a few: performance, features, reliability, aesthetics, conformance, serviceability, durability, and perceived quality.

In context with training, the European Training Foundation (ETF)'s glossary of terms (1998) defines quality as referring to either the inputs to training or the outcomes of training or even to the costs of training. Whatever the focus, identifying the quality of training depends on making explicit the criteria by which it is to be judged. Quality also refers to the training standards since they establish the criteria against which the training is to be judged. In the assessment of competences or of prior learning when there is no training, quality refers to the description of the competence, its level of performance and the proof to assess it.

Virtually no emerging industry has ever experienced dramatic growth without the acceptance of a set of common standards on which all product and service offerings are based. Learning industry is no different.

Often an e-Learning program will involve development by a number of people simultaneously. Therefore, there is need for standards to define the framework for on-line learning. Standards are desirable for interoperability, convenience, flexibility, and efficiency in the design, delivery, and administration. They provide consistent on-line dimension for all courses being designed so that all faculty are able to customize the on-line materials with minimal lead-time.

If we consider the present and future developments in e-Learning, many providers of e-Learning have failed to capitalize on available technology in an effort to keep costs down. In the rush to e-learning, the emphasis has been largely on the "e" and not the "learning". Until questions related to pedagogy, technology, universal acceptance of standards, competencies of trainer and learner, access, etc. are addressed, overall quality of e-Learning experiences would remain an issue.

### 3.1. Need for Standards for the Vendors

Designers and developers of on-line learning materials have variety of software tools at their disposal for creating learning resources. These tools range from simple presentation software packages to more complex authoring environments. Unfortunately, a number of software tools available from a wide variety of vendors produce instructional materials that do not share a common mechanism for finding and using the resource. To make the benefits of e-Learning a reality, e-Learning Standards must also be developed for the vendor community.

The broad base of vendor support for these standards will provide an added bonus for the developer because content will be more quickly and easily deployed to a larger number of customers, regardless of Learning Management System (LMS) environment, thus insulating the developer from the often complicated details of e-Learning standards specifications.

### 3.2. Need for Standards for the Content

Standards related to the content used in learning will exist basically to inform users and the systems they're using of what they're getting, how they're getting it, and the best way to use it. These would include: The language used to describe and reference the various media components of CBT for establishing the means for portability of the components from one system or tool to another; A mechanism for managing and adapting the presentation of lessons according to the needs of the learner in order to dynamically create customized instructional experiences, and; The packaging (format, coding, encoding, environment, attributes, and interactions) of learning content, to enable simple transmission and activation of learning content.

### 3.3. Technical Standards

According to a report on e-Learning Industry by Morgan Keegan & Co. Inc., the standard that is emerging as the format for the exchange of e-Learning information over the Internet is XML (Extensible Markup Language). XML has been developed by the W3C Consortium as a standard that can be adapted by various industries for their particular needs. It is key to the reusability and customization aspects of e-Learning.

### 3.4. Need for Standards to Train the Trainers

It is one thing to be technically qualified and experienced but it is another to impart the knowledge and skills to others. Here, the challenge is that of training the trainers. If the curriculum is kept up to date, how are the trainers up-dated in their knowledge and skills to train and demonstrate the new competences? In the face of change and the dynamics of development, if we are to have good training, then the question must be asked as to how to prepare the implementers of training – trainers. This is a very critical issue to be addressed while designing an e-Learning system. According to the National Centre for Education Statistics (US Dept. of Education), although 99% of public school teachers indicate that they have access to computers or the Internet in their schools, only a third of them feel well prepared to use them in their teaching.

### 3.5. Standardization will enable

- Easier tracking, retrieving and deployment of appropriate learning material with the help of Meta data
- Industry-wide standards for learning technology systems architectures.
- Use of instructional material in any management system, anywhere in the world

- Increased use of interoperable, reusable learning objects for creating customized courses
- Instructors to track and adjust the courses according to the student's performance
- Standardized, portable learner histories that can be transferred with the learner over time.

Standards in themselves do not ensure interoperability but the collaborative development of service models and technical architectures, based on open standards, will have a significant impact on the future direction of teaching and learning.

There are number of organizations working to develop specifications and standards such as IMS, EDUCAUSE, ADL, ARIADNE, IEEE, ISO etc to provide frame work for e-Learning architectures, to facilitate interoperability, content packaging, content management, Learning Object Meta data, course sequencing and many more. With this understanding, the content developer will be better equipped to improve their e-Learning development and delivery. The joint collaboration of IEEE & ISO has resulted in Joint Technical Committee of JTC1/SC36 of IEEE & ISO, which will be providing the universally acceptable standards. This coming together of many specifications and standards design and development organizations is a greater hope for e-Learning community.

#### 4. Conclusion

The role of quality is to ensure that interdependent processes are properly coordinated toward predetermined goals. Quality systems must be created in the context of a mission statement, set of objectives, and core values, and most importantly, the needs of stakeholders who are affected by the activities of the system.

It is because of the lack of standards that the industry is as fragmented and immature as it is today. Once a set of standards evolves in a workable form and consumers are educated on their merits, purchasers will begin demanding standard-complaint products, and the industry will undergo a

dramatic transformation in terms of quality, organization and efficiency. With the industry-wide adoption of a set of learning standards, which enable localization despite globalization of the system, the e-Learning content will become accessible, interoperable, adaptable, reusable, durable, and affordable.

#### Resources

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