

Chapter 16

TRIZ Guidelines for Innovating E-Learning Environments with Respect to Prosuming

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ABSTRACT

This chapter aims to give the reader a framework of reference for assessing, comparing, and innovating e-learning systems by regarding them as technical systems. The framework consists of a number of guidelines based on the 40 design principles of TRIZ, a systematic approach to develop innovative products or services based on the fact that the evolution of technical systems follows objective laws. Within the context of Web 2.0 and e-Learning 2.0, special attention is given to learners' prosumption and its trigger factors.

INTRODUCTION

Prosuming in the digital world, or equivalently, producing happens when a community of practice or interest engages in co-creating information, knowledge, artifacts, or services. Communities are then producing for their own consumption or usage. The prosumer concept can be easily understood in the field of digital activities and products. Among these are:

- Activities of the open source community where users are producing and sharing software expected to fit and satisfy their needs.
- Activities occurring in the Web 2.0 where active Internet users are:
 - Producing and consuming various media-based information, knowledge and ideas.
 - Customizing different services they use by assembling various artifacts.
 - Designing and sharing applications as it happens for example in some service providers' discussion boards where much can be learned, suggested, and shared.

Depending on its nature, quality, and context, the information or the digital artifact which are produced might contribute to knowledge construction and learning. Different producer-consumer roles with respect to the product might be distinguished. The consumer might embrace the producer role

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either by producing elements of the final product or by expressing voluntarily or not to the producer ideas on how to improve the product. Sometimes prosuming happens to be sneaky like when Internet users' searches and traces are used for search engine algorithm improving or for targeted advertising. TRIZ is a problem solving method that helps innovating and overcoming identified difficulties by considering 40 design principles. TRIZ applications extended to non-technical areas, for example education (Marsh, Waters, & Marsh, 2002). This chapter aims to take advantage of this approach to consider the most significant features required for an e-learning platform to favor learners' creation and co-creation that are useful for learning.

E-LEARNING PROSUMING

Today, information technologies allow consumers to collaborate with companies and other consumers to co-create and produce things of value, for example by proposing and voting for things that they would like to see produced (Walker 2007). This represents a fundamental change in the economic organization as long as the value produced is an "exchange value" by opposition to "use value" (Humphreys & Grayson 2008). Similarly, a fundamental change is happening in the e-learning organization. Learners are producing "use value" when they build and customize their personal platform. They are producing "exchange value" when their creation within the global platform in the form of content or artifact benefits some members of the learners and teachers community. This chapter explores the prosumer concept in the e-learning area. Therefore, we distinguish two types for the product of interest, digital products and knowledge or competence products. Digital products include all software and network resources that shape a given e-learning platform. Knowledge products refer to the intelligent content of any media type that contributes to the learning process.

Nowadays e-learning environments vary from rigid environments like Learning Management Systems (LMS) to flexible environments like Personal Learning Environments (PLE). LMS are roughly a technological support for classical nearly one-way teaching-learning where there is no real possibility for the learner to be actively engaged in the production of knowledge. Conversely, PLE are characterized by personalization, participation and productivity from the learner who turns to be an effective prosumer. The global environment that made this possible is the Web 2.0. In Web 2.0 users are consuming and creating content in an easy way of participation. Handy applications also called widgets can be shared and inserted in their personal user-friendly environment. PLE enables self-direction and self-organization and is well suited to lifelong learning where the learner builds his own learning path in accordance with his experiences and professional interests. Therefore, the challenge is to investigate and characterize the flexibility of these environments with respect to learning, teaching, and pedagogy and to define the parameters on which tutors can have control in order to bring collective innovation to the design and content of these environments. We are mainly interested in Web-based e-learning platforms. More precisely each e-learner creates, manages and controls his own platform, so he is a co-producer of the whole platform. Through actions like creation, sharing, collaboration, commenting and ranking with peers and tutors, the learner will gain and provide knowledge and skill in the field of interest, so he is a co-producer of content and knowledge. The e-learning environment, as an information system involves technical and social factors. We shall consider in this chapter how these factors affect each other with respect to "prosuming." Social factors that drive learners' community are mainly interest, perspective, purpose and need. We list below some quality aspects of an e-learning system and point out possible related prosumer activity:

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