Emotions: the forgotten key success in online learning

Eva de Lera, Carles Fernàndez and Magí Almirall
Universitat Oberta de Catalunya

Abstract. What are the keys for success in online learning? The state of the art in e-learning would let us know about technologies, teachers’ training, management, instructional design, community participation... but very probably it would not focus on the impact that affective states have on learning process, students satisfaction and of course, course success. Every time an instructional designer creates a virtual environment, unconsciously an emotional design is also being proposed. Technology and specifically ICT mediates learning, but also mediates emotions, and emotions are an inseparable part of learning.

In this paper we will show the 'Enjoy Guidelines', the tool that the Open University of Catalunya has developed in order to support designers in the creation of virtual learning environments that promote positive affective states such as motivation, attention, concentration... The guide consists of twelve basic design principles that can be applied in several ways for learning design and are specially useful for users that never took into account this emotional dimension.

Keywords. Affective learning, affective educational technology, human-computer interaction, emotions, usability, user-centered design

1. INTRODUCTION

The process that has led us to the incorporation of affective design in our educational environment has been very gradual, starting from a focus on cognitive aspects and functionalities and moving to a deeper layer as affect is. Following we summarize it.

Since the birth of the Open University of Catalonia (UOC) in 1995, several teams within the staff of the university such as teachers, technologists or instructional designers have made their contributions to the design of a rich but complex virtual learning environment. In most of the cases, these contributions have taken learners as the center in relation to the learning process, the technology they use, the services they receive, the community they belong to... Seven years ago we adopted a more systematic approach through the use of User Centered Design methodologies and usability that allowed us to gather more data about the interaction between our students and the virtual environment. Undoubtedly it was a big step in the way to reach real learners’ behavior and allowed us to propose more accurate designs. But although our questionnaires showed that the new designs reflected learners’ needs, we found many students arguing that spaces were not engaging enough. In this sense, users were conscious of the difference between an environment that works and fit their needs and an environment which is motivating. Our conclusion was that while classical usability studies were based on functional tasks, we needed a step forward to focus on fostering a more engaging overall experience. At this point of the process, we understood there was a deeper level, an emotional level acting as a powerful engine in the learning experience. Following Zaharias, affect is the “fuel” that learners bring to the learning environment connecting them to the “why” of learning (Zaharias, 2009)
Though questionnaires are a short and cost effective way to gather data, we already know that users may answer just to offer an ‘appropriate’ opinion or mediated by other variables. As Picard states, “self report is colored by awareness of internal state, reflections on how such a report will be perceived, ability to articulate what one feels, etc”. (Picard, 2004). Also, the use of questionnaires require the learning experience to be interrupted (or in any case, they can not be used at the same time learning is happening).

As a further step for a real learner-centered design we concluded that we needed a set of guidelines or main principles that should promote elements for engagement. The design of such guidelines were facilitated through the extensive 15-years work and knowledge developed by teachers, instructional designers, technologists and even other staff involved in design issues in the university such as the marketing department. The joint work of these experts is mandatory, since we know that human computer interaction and usability directly touch the field of instructional and other designers (Zaharias, 2009). As will be presented in the next section, we finally summarized all these conclusions in twelve principles as a methodology to help design engaging and motivating online learning environments for these e-learners. The basic idea for any of the principles is to keep high levels of the intrinsic motivation that learners bring while adding other elements of extrinsic motivation that improve the whole learning experience.

Affective computing and especially what has commonly been called ’affective learning’ is a young field where theorists and practitioners from several disciplines are contributing. To date there is no comprehensive, empirically validated, theory of emotion that addresses learning (Picard, 2004). Anyway, there is a consensus on the aim of the field as engaging learners in a successful experience through the comprehension and promotion of appropriate states. But the application of a specific methodology depends on each context and the philosophy of a particular institution. In this sense, our vision of the affective layer responds to a global approach. The pedagogical model of the UOC gives high importance to make learners feel part of a big community as a social network where they participate. In other words, the learning process is integrated in a higher system, so learning is not just the product of the learning materials’ interaction but the participation in the whole community where mentoring has a central value along with a big range of services and tools, many of them based on web 2.0 and connectivism (Siemens, 2009), and through these social networks and teachers guidance. In this sense, the learning environment is a big system where the student meets all their needs advised by mentors and supported by group of tools and services. This makes a difference, for example, with educational models that rely on high automatized systems where the role of social tools and services and human mentoring is less important. According to this view, our affective philosophy becomes global, holistic: we want learners to feel they ‘enjoy studying at UOC’ by using a set of affective technologies. Thus, the emotional dimension has to be visible in any of the spaces, tools or services that belong to the environment, so our approach is to evaluate the affective design of these functionalities, tools and services used in virtual learning environments. This approach is conceptually closer to educational technology than the term ’e-learning’, which is broader and generally used in a wider way. We, for instance,
do not focus on the emotional aspects related to instructional design methodologies and how the learning process develops.

In conclusion, we define our line of research and innovation as 'Affective Educational Technology', that focuses on the design and assessment of affective educational technology in order to elicit favorable states for learning. Positioning our contribution within the affective loop, we especially focus on the first stage of design of environments that foster positive emotions in the learning experience.

2. THE GUIDELINES

2.1 Creation and testing of the guidelines

A diverse set of studies were carried out by the University, by different departments or areas such as Marketing, Student Services and Learning Technologies. Our project involved gathering and analyzing the different studies, as each of these studies had their specific objectives (i.e. abandonment, new registration, new web services, etc.) but they all accounted for some aspects related to the needs and motivation of our learners.

UOC's learners are between 24 and 50 years old (approximately), often hold a previous degree and have a job and a family. In the interviews, focus groups and questionnaires, the learners who participated in these different studies considered themselves tired, stressed out, concerned about their health and having little leisure time. They mentioned their wish for having a better control of their personal lives and shared having a strong need to feel as part of an educational community and specifically, an innovative educational community. It seemed as they were looking for ways to justify the effort that they were making to study online, they wished for the experience of online learning to be enriching both personally and professionally, and looked for elements that would be more motivating or engaging. These are what we considered the key aspects that were affecting our e-learners and which should not be omitted when designing an online learning experience. The ENJOY guidelines were then born, and started being implemented immediately by the design and development teams. Every new application would need to use the guidelines as a checklist, as a way to ensure that these affective and emotional dimensions have been taken into account in the design.

As stated before, our philosophy of affective design impregnates the whole learning environment and its services, whether they’re educational or not. In our study we were not concerned about designing engaging pedagogical learning tasks, a key aspect in educational institutions which are currently focusing in the use of multimedia and games, edutainment, for increasing the engagement of the learning process (Perrone et al., 1996). In our study we wanted to focus on the other aspects of the learning environment, which we consider informal learning spaces which should not be underestimated: the homepage, the community tools, the structure, design, functionalities and other elements of the virtual campus that could, if designed properly, contribute to motivating and engaging the student.

Since the conception of the guidelines, new developments had to incorporate these guidelines into their design and development process, into the user centered design
methodologies (UCD) which ensured the effectiveness and efficiency of the tool or service and also monitored satisfaction. In such processes both qualitative and quantitative methods were used in our study. Firstly, MORAE (Usability Testing for Software and Websites, http://www.techsmith.com/morae.asp.) was used to gather quantitative information to ensure that the designed prototypes worked properly for our users, and secondly we gathered qualitative data through focus groups and interviews. The projects that had integrated the guidelines generated higher satisfaction levels.

To sum up, the ENJOY guidelines have been generated from the information gathered from several studies which included user analysis, and information from stakeholders, including the institution. The key aspects identified during the data gathering have been translated into design guidelines, in a way that those participating in the design of any tools, service or application in a virtual campus would understand what are the key elements that should be accounted for and avoid omitting. The ENJOY guidelines are meant to be used in conjunction, or better, integrated, with the other user centered design methodologies carried out to design virtual campuses (Gabbard et al., 1999). As UCD methodologies always ensure the efficiency, efficacy and satisfaction at a very functional basic level, the ENJOY methodology aims at supplying the emotional layer, to increase satisfaction.

The following are the 12 easy-to-follow guidelines for designers, developers, learning technologists and others participating in the e-learning design process:

2.2 ENJOY Guidelines: Guidelines for designing engaging virtual learning environments

1. **Personalization** – the environment must make the student feel like a person and not like a user. Use of communication strategies that are more personal, common language and options for this person to participate in this environment. According to the current trends in e-learning, the learner must have the possibility to design a learning space that makes sense for himself and incorporates areas or tools that do not necessarily provide our virtual campus but exists in the Internet. The final objective of personalization is the generation of a real ‘Personal learning environment’.

2. **Identity** – utilizing real and consistent images to help the student identify him/herself with the values and the community in a quicker and more efficient way. Generating a sense of belonging.

3. **Brand** – ensuring that the brand and the brand values are reflected throughout the virtual environment to reinforce the relationship between the student and the institution. Justifying the value proposition, why this University and not another.

4. **Community** – offering options to communicate, relate and participate. Offering options to make friends, to gather in small groups and large groups (i.e. organizing cultural activities that involve learners) and to promote associations. Making community options very visible and easily accessible.
5. **Surprise** – introducing positive surprise elements or special events in the initial entry pages or in strategic locations to make the students feel that they are part of a creative and dynamic community, or to act as reminders of why this is the place, a place that provides enriching stimulus. Creating the idea that ‘something is changing, something is moving’ all the time, even promoting some kind of arousal (Liping Shen, 2007)

6. **Innovation** – integrating innovative elements in the virtual environment, those that they may begin hearing or reading about in the media and other trend environments.

7. **Zen** – ensuring that there is not an overload of text in the screen, that white spaces are used, as well as photographic or graphic elements. Need to avoid unnecessary noise and obstacles, there is a need to design to safe time and be more efficient.

8. **Search** – providing shortcuts to students that have little time, ensuring that they can find the information they need by doing a simple search.

9. **Clarity** – utilizing lively and bright colors to facilitate interaction, reading and information visualization, providing guidance through the design.

10. **Situation** – ensuring that the student quickly recognizes the structure or map of the environment in a glimpse, without needing to scroll or to read a lot.

11. **Aesthetics** – ensuring a consistent aesthetic throughout, to help guide the student through his or her tasks and objectives.

12. **Recognition** – utilizing standard icons and symbols that can be easily and quickly understood without requiring the alternative text or an extra click to understand it.

Along with these principles, there is a need of balance in the amount of level of emotion that is promoted. It has been demonstrated that both high and low levels of emotion are bad for rational and active thinking. (Picard, 2004)
2.3 Results

We used an iterative methodology to test the guidelines. We exactly tested them in the pilot phases of two projects. In these projects we followed classic User Centered Design methods, guarantying all the information and requirements in the initial phase and developing low fidelity prototypes after that. Although the usability tests showed us that the design reflected users’ needs, in the interviews those same users let us know, in response to an interview item, that the design was not engaging enough.

In a second evaluation phase the prototypes were revised using the ENJOY guidelines. Five user experience specialists independently evaluated the prototypes utilizing the guidelines, and the results where then evaluated in conjunction. All specialists agreed that the guidelines allowed them to add significant value to the original proposal.

A revised prototype was then brought to different groups of students and potential students to be evaluated. All participants expressed a higher satisfaction than in the previous evaluation and related the benefits to their lifestyle, aside from their specific learning objectives and tasks. That these second round of prototypes were more engaging and motivating to the users than the previous ones.
3. CONCLUSION

Our results show that this easy-to-implement methodology can contribute to increase the motivation of the students and other users of an online learning environment. Our first conclusion is that definitely the introduction of affect really improves learning support and learning itself.

The ENJOY guidelines are a work-in-progress, continue to be evaluated in other projects and are expected to grow and be revised accordingly.

The ENJOY guidelines, together with the Ten Emotion Heuristics (De Lera, E. and Garrera, M., 2008) have helped us justify the need for developing a series of affective educational technologies, as incorporating affect into the learning environment has shown to be highly positive for the learners as they have an improved motivation and desire to learn and participate.

ACKNOWLEDGEMENT

This work is partially supported by the Spanish MCYT and the FEDER funds ref. TSI-020301-2008-26 (edit@) and TSI-020301-2008-9 (SUMA).

REFERENCES


**EVA DE LERA – Short Biography**

Eva de Lera is the principal investigator of the Joy of Learning project at the Office of Learning Technologies at the Universitat Oberta de Catalunya (UOC), exploring and designing Affective Educational Technology methods to help enhance engagement and motivation in online learning environments. She has been doing research in the areas of image and video analysis of face and body gestures (co-creating the Ten Emotion Heuristics), human computer interaction and user centered design. She received her M.S. degree in Information and Knowledge Society from the Universitat Oberta de Catalunya in 2008 and her B.A. degree in Psychology from New York University in 1998.

She is a founder and partner of Lilacom, a marketing and technology firm, her specifically, applying marketing research methodologies to user centered design methods. She is also the senior strategist for the Office of Learning Technologies of the UOC where she first served as the User Experience Evangelist (2001-2004). Eva has been on the Advisory Board of the Horizon Report in 2008 and 2009 (an ELI-Educause-New Media Consortium initiative and publication), is a participant in Curriki's Advisory Board (a Sun Microsystems' initiative for open content) and organizes Open EdTech, a yearly event which brings together leaders from different fields and disciplines to discuss the educational technology needs of the future.

She has presented her work and research at several conferences internationally (Online Educa, HCI International, HCI UK, E-Learn, Educause, UPA, iLearning, Sloan-C, NAFSA, NMC, EDEN, ED-Media, etc.).