

RHETORIC AND EMOTIONAL DESIGN FOR THE IMPROVEMENT OF USER EXPERIENCE IN MOODLE

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ABSTRACT

Learning Management Systems (LMSs) in education are necessary, especially since the Covid-19 pandemic. A good user experience (UX) in these systems has become increasingly important. However, there are limited resources that could guide implementing both the hedonic and pragmatic qualities of UX. The objective of the present study is to identify emotional design factors and apply an innovative perspective from a rhetorical perspective that could serve to improve the user experience. Utilizing the User Experience Questionnaire, a rhetorical evaluation, and four open-ended questions in three control groups, we evaluate Moodle at the Faculty of Sciences of the Universidad Autónoma de San Luis Potosí (UASLP). The findings show an improvement in UX that generated better user satisfaction. We concluded that ethos, pathos, and logos serve to cover the pragmatic and hedonic aspects of UX. This paper serves as a guide for other educational institutions that want to improve their LMS.

Keywords: Moodle, emotional design, user experience, rhetoric, ethos, pathos, logos, LMS

INTRODUCTION

The use of Learning Management Systems (LMSs), sometimes called virtual learning environments, has become increasingly important as part of information and communications technology (ICT) resources in the teaching and learning process. A good user experience (UX) in these types of systems is crucial for the benefit of their users—primarily teachers and students. It is essential to consider both the pragmatic and hedonic qualities of UX to improve the learning process. Most studies regarding Learning Management Systems have mainly focused on the pragmatic aspects of user experience, which are largely related to usability, as noted by Zaharias and Pappas (2016), and leave aside hedonic aspects that intervene in the interaction process.

Emotional design seeks to enhance both pragmatic and hedonic qualities while emphasizing hedonic. Emotional design has been implemented in Multimedia Learning, as seen in Mayer and Estrella (2014), Plass et al. (2014), Heidig et al. (2015), Tien

et al. (2018), Endres et al. (2020), Li et al. (2020), Chung and Cheon (2020), and Bülbül and Kuzu (2021). Furthermore, the application of emotional design factors in Learning Management Systems was implemented by Mokhsin et al. (2017).

In the work of Aguirre et al. (2017), a user satisfaction proposal was presented from the ISO/IEC 25010 product quality model that was applicable to elearning systems and considered three categories: utility, trust, and pleasure. There was another category called comfort, which was not considered as it refers to physical comfort. Although user experience and emotional design have been implemented in different educational resources, there is a gap between the evaluation of UX and the implementation of emotional design. Villareal-Freire et al. (2017) presented some guidelines, but as they mentioned, one of the disadvantages of the proposal was its size. Thus this paper presents a review of emotional design factors and an applied rhetorical lens that could help improve UX in LMS.

A redesign of the graphical user interface of the LMS Moodle at the Faculty of Sciences of the Universidad Autónoma de San Luis Potosí (UASLP) was implemented. Considering some emotional design factors from a rhetorical perspective, we then evaluated UX using the User Experience Questionnaire and carried out a rhetorical evaluation. We asked four open-ended questions to three control groups to obtain students' opinions. The objective of this study was to identify emotional design factors that could be used with a rhetorical lens from the three modes of appeal (logos, ethos and pathos) and to evaluate user experience from a quantitative and qualitative approach to see if there is an improvement in the Moodle LMS UX.

LITERATURE REVIEW

With the advent of ICT technologies, education is one area that is greatly affected, and LMS is one of these technologies that could benefit the teaching and learning process. According to Mohd Kasim and Khalid (2016), a Learning Management System “is a web-based software package that is designed to plan, implement and evaluate learning, facilitate student interaction, give performance feedback and manage students' activities” (p. 59). LMS, sometimes also called a Virtual Learning Environment, are more important today than ever before, due in part to the Covid-19 pandemic, which abruptly transformed most traditional education into a full elearning experience.

There are typically two types of issues that cause users to change from one LMS to another: “Design issues that directly affect the user (aka customer) experience, such as poor usability, poor visual design, and lack of responsive design, and managerial issues, such as reporting capabilities and adjustments to organizational needs” (Zaharias & Pappas, 2016, p. 64). This paper focuses on the first aspect, which means problems with the user graphic interface. Aguirre et al. (2017) comment that:

Traditional user studies focus on objective parameters associated with measurable and verifiable aspects of an interactive product, neglecting hedonic components that are part of user satisfaction and are directly related to the degree of involvement and motivation that a person shows when using an elearning system (p. 175).

According to Hassenzhal (2003), user experience has two qualities: pragmatic quality, which mainly refers to usefulness and ease-of-use, and hedonic quality, which is divided into stimulation, identification, and evocation. Rogers et al. (2015) noted that

There are many aspects of the user experience that can be considered and ways of taking them into account when designing interactive products. Of central importance are the usability, the functionality, the aesthetics, the content, the look and feel, and the sensual and emotional appeal (p. 14).

Thus, it is precisely emotional appeal that emotional design seeks to influence. Walter (2011) explained in his book that emotional experiences make a profound imprint on our long-term memory and that emotion and cognition are linked.

It is crucial to note that according to the 2020 Horizon report by EDUCAUSE (2020), User Experience Design in Pedagogy is one of the main trends in education, along with measuring user experiences, that has the goal of creating meaningful learning experiences for all students. As Norman (2012) pointed out, everything we do has a cognitive and affective component—cognitive because it assigns meaning and affective because what it assigns is value—and therefore, emotions are inseparable from cognition.

The work of De Lera et al. (2013) provided insight into how emotional design aspects could be implemented. They created 12 enjoy guidelines as a way to “incorporate the emotional and psychological dimension of the students to the design of the learning environment” (p. 183). These guidelines are personalization, identity, brand, community, surprise, innovation, zen, search, clarity, situation, aesthetics, and recognition. It is important to note that in this present paper, identity and brand are renamed brand image. Whereas zen, clarity, situation, and aesthetics are mainly related to visual design, which refers to the composition and elements of the user interface.

Fessenden (2017) recalled that after achieving functionality, reliability, and usability, delight can be pursued. In her article she concluded that animations could achieve surface delight along with tactile transitions or gestural commands, microcopy (i.e., injecting humor and slang and predicting

users' questions in advance), and beautiful and relevant high-resolution imagery and sound interactions. Cyr (2013) commented that some design aspects that can be considered for emotion and websites are color, images, shapes, and photographs.

On the other hand, Mayer and Estrella (2014) applied some emotional design aspects to multimedia material in which they evaluated color and human-like faces. Plass et al. (2014) evaluated color and round face-like shapes. Tien et al. (2018) examined color and animation. Endres et al. (2020) used warm colors, animations with social cues, sketched symbols and characters, friendly everyday language, and a frame story with a social agent. And Li et al. (2020) evaluated positive design—color and anthropomorphism—versus neutral design—grayscale.

Chung and Cheon (2020) applied emotional design using background images with motivational cues, and Bülbül and Kuzu (2021) created different animations considering color, rounded shapes, personification, character animations, and

sound effects. Wang et al. (2021) implemented color as a factor of emotional design. Plass et al. (2020) applied emotional design factors in digital games for learning, such as expression, color, shape, and dimensionality of game characters.

Emotional design aspects in an LMS were implemented in the work of Mokhsin et al. (2017). They commented that “four key designs have been identified to be potentially useful for these projects, which are the body, logo, navigation, and login of the website” (p. 435). Finally, Collazos et al. (2015) presented some hedonic factors. Table 1 shows the main factors found in the literature review and the factors proposed in this paper.

It is important to mention that the login page is crucial in any LMS, as it provides access to the system only to the valid user, and it is usually the first page that a student sees. Thus, the image presented on this screen was changed four times with an animated gif, according to different celebrations or events, in order to see if these dynamic changes generated reactions in the students. These Mexican

Table 1. Emotional Design Factors

Authors	Factors
De Lera et al. (2013)	Personalization, identity, brand, community, surprise, innovation, zen, search, clarity, situation, aesthetics, recognition
Cyr (2013)	Color, images, shapes, photographs
Mayer & Estrella (2014)	Color and human-like faces
Plass et al. (2014)	Color and round face-like shapes
Collazos et al. (2015)	Translation, information symmetry and direction, color, individualism / collectivism, genre, contextualization or information architecture
Mokhsin et al. (2017)	Body (color and layout), navigation, logo (position), login page
Fessenden (2017)	Animations, tactile transitions or gestural commands, microcopy (i.e., injecting humor & slang, predicting users' questions in advance), beautiful, relevant high-resolution imagery and sound interactions
Villareal-Freire et al. (2017)	Color, typography, simplicity, persona, nature in design, seduction, graphics and multimedia, layout of screen elements
Tien et al. (2018)	Color and animation
Endres et al. (2020)	Warm color, animations with social cues, sketched symbols and characters, friendly everyday language, frame story with a social agent
Plass et al. (2020)	Expression (happy, neutral, sad), color (warm, neutral), shape (rounded, square), dimensionality (2D, 3D, immersive 3D)
Li et al. (2020)	Positive design—color, anthropomorphism—vs neutral design—grayscale
Chung & Cheon (2020)	Background images with motivational cues
Bülbül & Kuzu (2021)	Color, rounded shapes, personification, character animations and sound effects
Wang et al. (2021)	Color

celebrations were the Day of the Dead (November 2), the Mexican Revolution (November 20), the Day of the Flag (February 24), and the event was the arrival of Spring (March 20). The animated gifs for these celebrations were designed and placed five days before the specific date and removed one day after. The following section describes how emotional design relates to rhetoric in user experience.

Rhetoric, User Experience, and Emotional Design

From a rhetorical perspective, the system is seen as a medium of communication. As Norman (2019) pointed out in his essay, design is a conversation between designer and user in which each placement of an object, choice of materials, and so on, is both for utility and communication. The designer deliberately places signs and signals on the artifact to communicate with the user. In relation to rhetoric and human-computer interaction, Joost (2006) presented a communication model for the design and evaluation process in which she proposed a model with three parts, namely the system designer, the system itself, and the audience—the addressed user and the actual user. In the production phase, the designers create a proposal that precisely has in mind the addressed user, and later the design is evaluated by the actual user, as Joost (2006) points out: “The evaluation of the user testing is the base for the next iteration of the design process” (p. 168).

De Sousa takes an approach from semiotics. The semiotic theory of HCI, De Sousa (2005) explained, brings together under the same communicative context the three sources of interpretation and communication involved in the design of interactive computer artifacts: designers, users, and computer systems. From this perspective, every computer artifact introduces new signs in its users’ universe; therefore, computer artifacts result from their designers’ reasoning, choices,

and decisions. This fits with the invention stage of rhetorical production, as will be discussed later. Wahyurini (2020) said that rhetoric in UX is traditionally viewed as a mean of persuasive technology that leads the users to take an action to reach designated goals. From this perspective, there are three main parts from a rhetorical point of view: the designers, the users, and the system or application. Thus, during the design process, the rhetorical foundations are used.

Ehshes and Lupton (1987) explained that the design process from a rhetorical point of view is composed of five phases, the first being invention, which consists of discovering plausible arguments and supporting material relevant to the situation. This is where the designers select the elements that will be part of the interface or the system. The second stage corresponds to disposition, where arguments, organization, layout, and planning are arranged. The third stage is elocution, in which the fitting of formal language to the argument is considered, including the use of rhetorical figures and stylistic choices. The fourth stage is memory, which corresponds to the understanding of the material, decisiveness of the presentation, and the final stage is the delivery, presentation of arguments, execution, and choice of media (Ehshes & Lupton, 1987).

Regarding these stages, Oliinyk (2021) commented that *inventio* is the stage of intentions, ideas, and formulation of the hypothesis of future performance, while *dispositio* is responsible for the stages of development and delivery of the main ideas formulated and outlined in *inventio*. In *elocutio*, the message acquires linguistic figurative expression as a result of additional substantive, evaluative, emotional, and volitional effects, which corresponds to how the design elements are presented. Finally, the delivery or action is the process of pronouncing text, or the rhetorical broadcasting. Table 2 presents the

Table 2. Phases of Rhetorical Production

Traditional phases of rhetorical production	
Inventio	Concept development, finding relevant ideas, understanding the characteristics of the problem, selection of elements.
Dispositio	Organization, structure according to a grid, layout, depends on the communicative intention.
Elocutio	Stylistic options, expression, how the arguments are presented. Use of rhetorical figures to provide greater expressiveness, according to the desired intention.
Memory	Full revision of the design for the production.
Actio	Execution and reception of the graphic discourse.

Source: Synthesized from Ehshes & Lupton (1987) and Oliinyk (2021).

five phases of rhetorical production.

In rhetoric, there are three modes of appeal: *logos*, *pathos*, and *ethos* (Ehse & Lupton, 1987). *Logos* appeals to reason and aims to instruct, while *pathos* appeals to emotions and aims to move, and *ethos* corresponds to ethical appeal. As Wahyurini (2018) commented, *logos* is the rational arguments or the message, *pathos* appeals to the audience's emotions, and *ethos* refers to the character or credibility. In terms of interactive systems, Sosa-Tzec (2017) explained that the logical dimension (*logos*) is concerned with the definition and structure of the information shown on the interface and with the functionality of the system or website. The ethical dimension (*ethos*) focuses on the designerly quality of the interface components and is concerned with the appearance and user's perception of the functionality of the components. The designers take care of the execution. Finally, the emotional dimension (*pathos*) is concerned with the user's emotional reactions based on the interface components.

Rhetorical figures used at *elocutio*, Ehse and Lupton (1987) said, could influence the three modes of appeal in that they can move (*ethos*), they can delight (*pathos*), and they can instruct (*logos*). Tseronis (2021) said that figures have first and foremost rhetorical relevance. They convey the meaning that helps frame the message for a particular audience and a particular situation with the configurations of semiotic resources (image and text combinations) that may characterize it. As can be seen, the three modes of appeal aim at the functional part of a system, the pragmatic quality, and at pleasure, the hedonic quality.

Wahyurini (2020) commented that interaction design aims to create an enjoyable experience, a feeling of satisfaction and pleasure toward a product, by arranging visual elements, including texts, font types, and images. In terms of visual rhetoric, Amare and Manning (2007) said that it goes beyond basic document design issues to include the rhetoric of both textual visuals and graphics visuals where the author, message, and audience all connect. Sosa-Tzec (2017) explained that interactive systems have compositional and experiential qualities, where compositional quality refers to the display of one, two, or more of the modes at a certain point of the user experience, and experiential quality refers to the outcome of attributing a specific meaning to

such a point based on individual judgment.

In this vein, Norman (2012) proposed that in emotional design, there are three levels of design that a product can evoke in users: visceral, behavioral, and reflective. Visceral corresponds to the first impressions, appearance, shape, and initial impact; behavioral is the functionality part and effectiveness of use; and reflective is where, through the interaction or use of the system or product, the users generate identity, interpretation, and meaning. The combination of the three produces a delightful experience. Walter (2011) has a similar outlook. He stated that it is vital to consider that the system or the product should fulfill four stages, which are functional, reliable, usable, and pleasurable.

During the design process of an interactive system, the product or user interface must be considered not only the functional or the pragmatic aspects but also to pursue delight, which means the hedonic aspect of user experience. Regarding user satisfaction, the quality norm ISO/IEC 25010 presents similar aspects. Utility, trust, and pleasure should be considered if reasonable user satisfaction in elearning platforms is expected. The hedonic components are part of user satisfaction and are directly related to the degree of involvement and motivation that a person shows when using an elearning system (Aguirre et al., 2017).

Thus, according to Aguirre et al. (2017), utility corresponds to the pragmatic objectives in an LMS, which are aimed at promoting the learning process so that it is achieved in a simple and fast way. Trust is positively affected by ease of navigation within the environment. Furthermore, good use of visual design elements and a consistency in visual appearance, interaction elements, navigation, and terminology increase user confidence (Aguirre et al., 2017). Finally, pleasure is the degree to which a user gets pleasure from fulfilling their personal needs and if the system or the interaction provokes pleasant memories.

From this perspective, the utility, trust, and pleasure of ISO/IEC 25010 can be equated with the three modes of appeal: *logos*, *ethos*, and *pathos*. *Logos* appeals to reason, the pragmatic part of the system, and *ethos* to trust, where the elements, properties, and arrangement/layout could generate user confidence. Finally, *pathos*, corresponds to pleasure and delight, and thus the proper use of

rhetorical figures could aim to emotions for pleasure. Table 3 presents the triangulation among the ISO/IEC 25010 proposed by Aguirre et al. (2017) and the modes of appeal.

Table 3. Triangulation among ISO/IEC 25010 and Modes of Appeal

ISO/IEC 25010	Modes of appeal	
Utility	Logos	Aims to reason, pragmatic
Trust	Ethos	Aims to trust, credibility
Pleasure	Pathos	Aims to emotion, hedonic

Sosa-Tzec (2017) said that many current interactive systems utilize a graphical user interface (GUI) to allow the user to interact with the system, or at least, use visual cues to provide feedback to the user. As Wahyurini (2020) said, the means of persuasion are in the visual elements of an interface: images, layouts, sounds, font types, texts, animation, avatars, and videos. Thus, the proper use of the three modes of appeal should help achieve the communicative aspect intended by the designers and pursue delight in any interactive systems so that better user satisfaction can be fulfilled. Figure 1 shows the UASLP Faculty of Science's LMS with the Clean theme included by default in Moodle, and Figure 2 shows the implementation of the emotional design factors. Figures 3, 4, and 5 are presented in the appendix and correspond to the course icon redesigned with the animated GIFs placed on November 2, November 20, February 24, and March 20 at the login page.

Figure 1. Moodle with Clean Theme

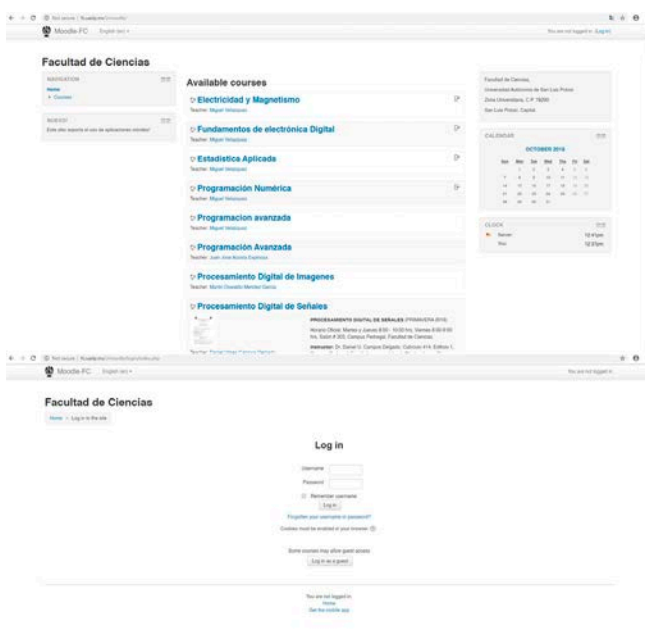
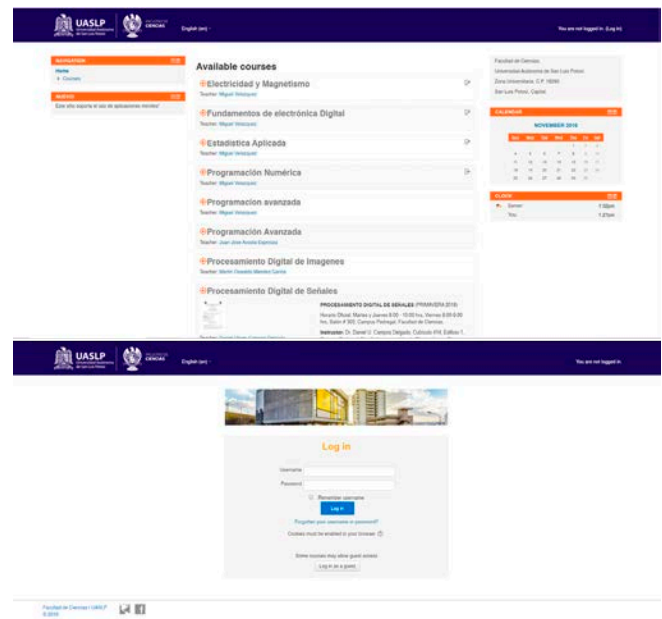


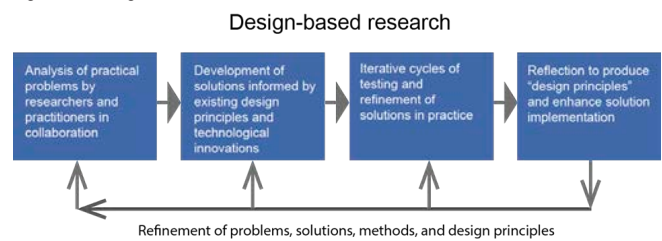
Figure 2. The Redesigned Screens Taking into Account Some Emotional Design Factors



METHODOLOGY

This study presents some results of a doctoral thesis. The research uses a Design-Based Research methodology, which is, according to Amiel and Reeves (2008), "The ultimate goal of design-based research to build a stronger connection between educational research and real world problems" (p. 34). Figure 6 shows the steps of this methodology.

Figure 6. Design Based Research.



Source: Synthesized from Amiel & Reeves (2008).

The analysis and development of solutions were implemented according to a literature review. First, the iterative testing cycles were made with an expert's feedback. Then changes to the interface of Moodle were made, and finally, the evaluation of the user experience was made with the User Experience Questionnaire (UEQ). This questionnaire was used in the works of Santoso et al. (2016) and Sutadji et al. (2020). Furthermore,

in Salehudin et al. (2021), work was used to evaluate visual media processing. The UEQ has two versions, one with 26 items that evaluates the pragmatic quality represented by perspicuity, efficiency, and dependability, and the hedonic quality characterized by stimulation and novelty. The short version has eight items that evaluate only the overall pragmatic and hedonic quality. We used the long version in this work, which also evaluates attractiveness, i.e., the product's overall impression. We analyzed the data from UEQ with an Excel sheet. In the standard interpretation, values more than 0.8 represent a positive evaluation and values less than -0.8 represent a negative evaluation, and values between 1.5 and 2 indicate a very good quality (Santoso et al., 2016).

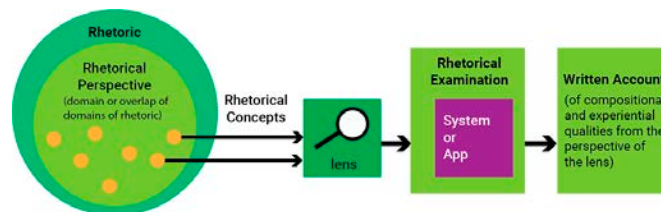
The population of the study consisted of 322 male and female students who used the LMS Moodle after November 1st, 2019, i.e., after the intervention. The sample of the study consisted of 71 male and female students between 18 and 25 years old that answered the UEQ. In order to respect confidentiality, no personal data was asked such as name or gender. The sample represents a 90% confidence level and 8.7% margin of error, according to equation 6.8.2 in Daniel (1995). The animations presented in Figure 4 were displayed to control groups 1 and 2. These groups were evaluated before the Covid-19 pandemic, so the UEQ was carried out in presential modality. When the animations of Figure 4 were displayed to control Group 3, this UEQ was using Google forms as well as the rest of the sample. Table 4 shows the triangulation between the categories of the User Experience Questionnaire and the utility, trust, and pleasure of user satisfaction according to ISO/IEC 25010, along with the three modes of appeal: logos, ethos, and pathos.

Table 4. Triangulation of UEQ Categories and ISO/IEC 25010

ISO/IEC 25010 as proposed in Aguirre et al. (2017)	Modes of appeal (Ehses & Lupton, 1987).	UEQ categories
Utility	Logos	Efficiency
Trust	Ethos	Perspicuity Dependability
Pleasure	Pathos	Stimulation Novelty

In order to have qualitative data to contrast against UEQ results and a robust understanding of the reality, three open-ended questions were applied to Groups 1 and 2, which were: What did you think of the changes made to Moodle? Which of these changes, did you like the most, or which did you not like it, and why? How did you feel about using Moodle? In this vein, during the doctoral research we applied two open-ended questions to Group 3, but here we only presented the results of the second question (because the first question had other objective): In terms of Moodle's User Interface, what would you enhance or what changes do you consider more convenient? We read the participants' responses to identify similar statements and themes, so data triangulation could be carried out later. After that, we used the Rhetorical Evaluation of Interactive Systems (Sosa-Tzec, 2017) for the rhetorical evaluation. Figure 7 shows the process.

Figure 7. Rhetorical Evaluation of Interactive Systems



Source: synthesized from Sosa-Tzec (2017).

RESULTS

Tables 5 and 6 show the main results of the UEQ, and Figure 8 presents the evaluation of each category obtained from the UEQ applied to the students.

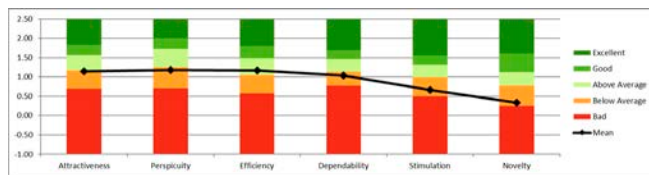
Table 5. Results of UEQ

	All	Group 1	Group 2	Group 3
Attractiveness	1.15	1.28	1.27	1.62
Pragmatic quality	1.12	1.20	1.37	1.47
Hedonic quality	0.5	0.63	0.58	1.02

Table 6. Results of UEQ Categories and the Triangulation with ISO/IEC 25010

UEQ categories	ISO/IEC 25010	All	Group 1	Group 2	Group 3
Pragmatic					
Perspicuity	Trust	1.18	1.42	1.25	1.45
Efficiency	Utility	1.16	1.06	1.52	1.70
Dependability	Trust	1.03	1.14	1.33	1.25
Hedonic					
Stimulation	Pleasure	0.66	0.81	0.57	1.18
Novelty	Pleasure	0.33	0.44	0.60	0.86

Figure 8. Results of UEQ



Source: UEQ Analysis tool

The Cronbach- Alpha coefficients for Attractiveness is 0.88, for Perspicuity 0.76, for Efficiency 0.81, for Dependability 0.64, for Stimulation 0.73, and for Novelty 0.59. Most of the values have a sufficient scale consistency, except for novelty, but as Salehudin et al. (2021) and Santoso et al. (2016) commented, it could be a misinterpretation of the item. Table 7 presents the rhetorical analysis of the course icon and Table 8 the rhetorical analysis of the login page.

Table 7. Rhetorical Analysis of the Course Icon

Rhetorical stages	Analysis
Invention	The use of a circular form gives pregnancy to the icon, the four circles arranged in x and y axes denotes an interrelated group, the play icon added denotes the virtual modality, the interaction through a screen.
Disposition	Circles are placed in an x and y axis; the play icon is centered.
Elocutio	Use of rhetorical figures Sinecdoque and Quiasmo.
Memory	Icon image.
Actio	Redesign of the course icon.

Table 8. Rhetorical Analysis of the Login Page

Rhetorical stages	Analysis
Invention	Use of institutional color and institutional logos of the UASLP and Faculty of Sciences, with the addition of an image on the login page, make the login button more visible with a blue color.
Disposition	The structure of the template was not changed. Logos on the top-left position. Image between the header and input fields (user and password). Copyrighted mark and links to Facebook and website at the footer.
Elocutio	Use of color, images, and institutional images (brand image).
Memory	CSS code and images, hosted on the server that has the LMS Moodle.
Actio	Redesign of the interface in the LMS Moodle.

From the modes of appeal, the structure it is oriented towards the functionality of the icon (logos), and the position allocated in x and y axes generate confidence (ethos). Color is related to the paths; the orange was chosen since it is complementary to the institutional blue.

From the modes of appeal, the structure or layout it is oriented towards the functionality of the system (logos), and to generate trust (ethos), it works together with the use of the institutional color and the institutional logos. Pathos at the login page is through color and image, and at the available course page through color and course icon. Figure 9 presents the frames of the animated gif placed at the login page before November 2, 2019, so users started to recognize it, and it was retired after November 2. Table 9 presents the rhetorical analysis.

Figure 9. The Frames of the Animated gif



Table 9. Rhetorical Analysis of the Animated gif “day of the dead”

Rhetorical stages	Analysis
Inventio	Images of cempaxúchitl flowers, chopped paper, skull, and purple color associated with death but ceremonial (religious).
Dispositio	The chopped paper was placed in the upper part of the composition, to denote being hung, and it is accentuated with the cempaxúchitl flowers in the top left and right corner. To draw the user’s attention, an animated skull that appears and hides from the bottom-right corner, was placed.
Elocutio	Use of the rhetorical figure of personification and alliteration.
Memory	Image hosted on the server that has the LMS Moodle.
Actio	Design of the image placed in the LMS Moodle login page.

From the modes of appeal, the structure of the image, in the upper part of the composition, appeals to the logos and ethos through the ordered language, with the assumption that the user knows one of the most iconic festivals in Mexico. The pathos mode of appeal is generated through the color and elements related to the festival, and through the animation.

DISCUSSION

According to the literature review, as shown in Table 1, among the factors that can be used to implement emotional design are color, brand image, animations, images, personification, shape, layout, login page, sound, microcopy, cultural factors, genre, typography, and information architecture. It is important to say that all these factors will be used according to the context, and from a rhetorical perspective, as inventio points out, it is crucial to understand the characteristics of the problem.

On the other hand, the UEQ shows an above-average evaluation in most of the pragmatic aspects and a below average in the hedonic aspect. When these results are compared with the students’ responses to open-ended questions, there is a correspondence between the pragmatic and hedonic qualities. For example, the results show that students agree that the visual aspect is improved. Two people even commented that it looks more modern with those changes. They used the word “pleasant” a total of six times to refer to

Moodle with the intervention carried out, and they also mentioned the word “comfortable” a total of seven times.

Among the narratives that can contribute to this are: “I liked the new one as it looks more modern,” “The only change I notice is the appearance which is pleasant,” “The change in the cover and the ordering of the home page, make it more pleasing to the eye,” “Improved ordering,” and “The design and color palette used makes it feel more modern.” As for the animated gifs placed at the login page, it was mentioned two times as the change they liked most: “¡Happy day of the dead!” and “I liked that they were themed, my favorite was Halloween. I like that holiday,” although it was not for that festival, it is clearly related to that image. Here it is important to remember that a login page at any university’s LMS is crucial since it represents access to the system and is generally on the main page, it should delight users of this page as this is also where a sense of community could begin to be made.

These answers correspond to Groups 1 and 2. As for the open-ended question presented to Group 3, in the narratives, they found that, in general, the interface is pleasant and intuitive, but for example, one student said that “I would improve the design, of course it is functional, but it needs to be more eye-catching and have didactic things that one can use...,” and another said, “That is changing towards the modern, that has more current designs.” Finally, it is essential to state that in Group 3, with the best result in hedonic quality, one of the authors of this research was the professor; therefore, two questions arise for future research from these results: How much does a login image impact the hedonic evaluation? Moreover, how much does an instructional design with an LMS impact UX evaluation?

In general, the results show a better evaluation of the pragmatic aspects of the UX—trust and utility—while the hedonic aspects of the UX are still below average. One of the reasons could be the Clean theme of Moodle. Since the intervention took place in the middle of the semester, it was thought better not to change the central theme of Moodle used at that time, as users might have felt a bit confused. For this reason, the intervention was conducted with the Clean theme.

On the other hand, the results showed consistency with some of the literature, specifically around the idea that there is an interlink between

the visual appearance of a system and its enjoyment, trust, and satisfaction, as Cyr (2013) and Aguirre et al. (2017) stated. As a result of the color palette, the aesthetic of the LMS is considered more modern and organized. Likewise, using a brand image that includes an image of the campus gives that sense of community that De Lera et al. (2013) refer to, and the position of the logo is consistent with what Whinton (2016) said—that users are 89% more likely to remember logos shown in the traditional top-left position.

From a rhetorical perspective, the results show that the three modes of appeal, logos, ethos, and pathos (Ehres & Lupton, 1987), come together to fulfill the functional, trust, and pleasure categories of user satisfaction from ISO/IEC 25010 (Aguirre et al., 2017). Thus, logos could help to improve the design problems related to poor visual design or usability as it targets functionality. In terms of trust or ethos, the consistency of visual appearance and navigation throughout the system should contribute to this part. In general, it can be said that Moodle's GUI has the elements/layout that enable users to achieve their goals. The use of rhetorical figures and some emotional design factors could improve the user experience in terms of pathos or pleasure.

As Wahyurini (2020) said, logos, ethos, and pathos work simultaneously within the interaction process between humans and the system through the image, layout, font type, and animation, among others, which are the elements that persuade. Thus, as shown in the five stages of rhetorical production, the choice of elements, the structure or layout, and the use of rhetorical figures allow reasonable user satisfaction. Sosa-Tzec (2017) said that rhetoric offers a set of constructs to allow a researcher to analyze and articulate the links between composition, meaning, and emotion. This covers the three categories of user satisfaction. The modes of appeal and the five rhetorical production stages help the compositional and experiential qualities of the user's experience.

The results show that emotional design factors used from a rhetorical perspective help improve the pragmatic and hedonic quality of UX. According to the literature review, color, images, animation, personification, and layout, among others, are helpful for the design of an LMS and the implementation of emotional design. Furthermore, considering the three modes of appeal benefits the design process.

As for the evaluation, this paper shows that the UEQ can help to evaluate user satisfaction in an elearning system with respect to the ISO/IEC 25010 standard. It is important to remember that a good user experience is crucial for the teaching and learning process.

CONCLUSION

The changes made to Moodle's user interface contributed to a good evaluation of the user experience in Moodle, as shown by the attractiveness value. Furthermore, the open-ended questions and rhetorical evaluation represent a qualitative approach used to compare UEQ values. The congruence between students' expressions and UEQ scores means that logos, ethos, and pathos converge at some point to promote the pragmatic and hedonic qualities of the user experience. For example, the layout was never changed, but the color and contrast used allowed the structure to be seen as more efficient.

Emotional design aspects of ethos, pathos, and logos seen through the rhetorical lens are useful to cover the functional, trust, and pleasure of user satisfaction. In addition, the proper application of these aspects could serve as a guide for implementing the rhetorical perspective in learning management systems and any other information systems or applications, since they all use a graphical user interface.

Future work includes implementing this approach in other interactive systems, and using other Moodle themes that incorporate these factors could help improve hedonic ratings. Among the limitations are that the rhetorical evaluation was made only from one person and also the sample, even though it is representative, could be broader. It is important to point out that this work contributes to the evaluation of user satisfaction in an LMS as it triangulates the UEQ categories with the ISO/IEC 25010. It can also serve as a guide for implementing emotional design aspects in LMSs or other ICT resources related to education from a rhetorical perspective so that meaningful learning experiences can be created for users, primarily students and teachers.

This paper presents an innovative lens from a rhetorical perspective, but there is still much to be done. However, the literature review and the results presented here could serve as a guide for

implementing user satisfaction from a rhetorical perspective. Every element of the graphical user interface should communicate something. This is a big commitment for any designer to know how to persuade, inform, and delight users so that a better user experience can be achieved.

ACKNOWLEDGEMENTS

Thank you to Conacyt for the doctoral studies scholarship and to the Manuscript Writing Training Team (CEMAI for its Spanish acronym) of Conacyt.

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APPENDIX

Figure 3. The Course Icon Redesigned



Figure 4. The Animated gifs Placed on November 2 and November 20 at the Login Page

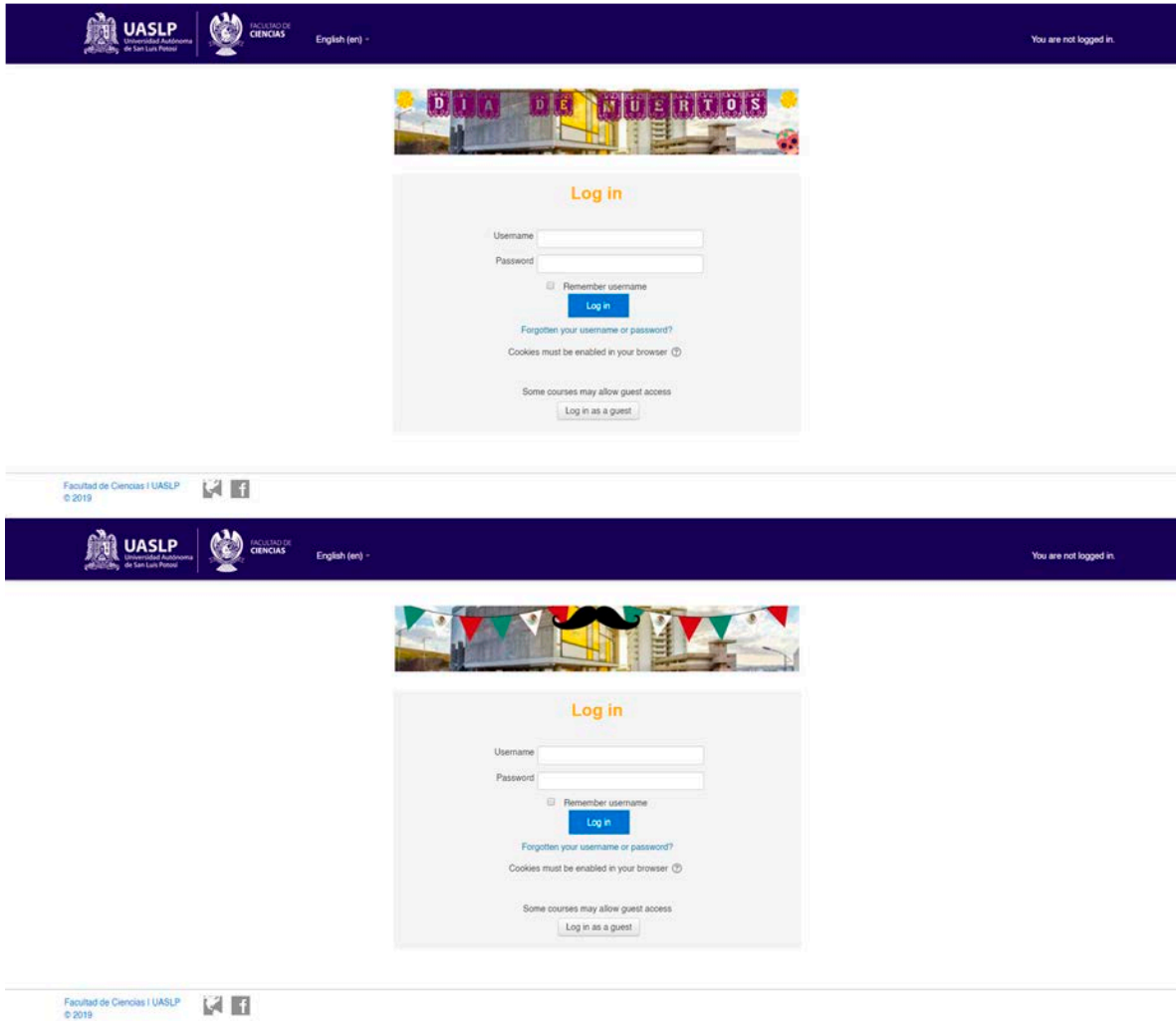


Figure 5. The Animated gifs Placed on February 24 and March 20 at the Login Page

