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## E-Learning success model for instructors' satisfactions in perspective of interaction and usability outcomes

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### Abstract

E-learning approaches could be handled in a system design view in which the system components and factors have critical roles in order to assure success of whole system. In such an e-learning design view, online instructors (or faculties) have the most critical role as the most important actor. Therefore there is an emerging need for investigating the factors affecting instructors' performance in e-learning systems. Satisfaction is one of these factors that affect usability of the system which also directly affect instructors' performance. In this study, factors related to instructors' satisfaction in e-learning systems have been investigated in order to develop a basic model called "E-Learning Success Model for Instructors' Satisfactions" which is related to social, intellectual and technical interactions of instructors in whole e-learning system. "E-Learning Success Model for Instructors' Satisfactions" could be a basic guide for e-learning designers, online instructors and policy makers to understand interaction and usability outcomes related to satisfaction of instructors.

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### 1. Introduction

Satisfaction of the users in the computer based and information systems is very important for developers and administrators of these systems [30]. Because success of the computer based systems generally associated within the user satisfactions [1, 2]. For the information systems quality and usability, there are international standards such as ISO 9241-11 which explains that information should be retrieved in a way that satisfy the standards in terms of measures of user performance and satisfaction. In the case information technology systems, satisfaction is an outcome of a function or an interaction occurring when the results fit to expectations of a person; or is a function of how well a product or event fits his requirement; or solutions within an acceptable range [3]. Satisfaction also can be also defined as the "being success in the designated tasks" [4, 5]. User satisfactions also have other dimensions like "output quality, man machine interface, staff and services, and various user constructs such as feelings of participation and understanding" [27].

Constructing theory and the measurement methods for user satisfaction is investigated by researchers and these efforts resulted in some models showing the components of users' satisfaction [6, 7]. End User Computing Satisfaction Model [8, 9] is one of user satisfaction models specified for information systems with five sub categories which are content, accuracy, format, ease of use, and timeliness. Additionally DeLone and Mclean [10] proposed a model for the information systems in order to understand the system success relating to user satisfaction

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with the components systems quality, information quality, use, user satisfaction and net benefits. When applied this model in an e-commerce case the authors of this model suggest the success metrics as in Table 1.

Table 1. E-Commerce Success Metrics

Systems quality	Information quality	Service quality	Use	User Satisfaction	Net benefits
. Adaptability	. Completeness	. Assurance	. Nature of use	. Repeat purchases	. Cost savings
. Availability	. Ease of understanding	. Empathy	. Navigation	. Repeat visits	. Expanded markets
. Reliability	. Personalization	. Responsiveness	patterns	. User surveys	. Incremental additional sales
. Response Time	. Relevance		. Number of site visits		. Reduced search costs
. Usability	. Security		Number of transactions executed		. Time savings

Delivery of the information and learning materials in e-learning systems are a heavily based on usage of information technology and services [28]. Considering e-learning systems as a part of information a system there are also studies to measure and models the user satisfactions for e-learning systems. For example, Matsatsinis, Grigoroudis and Delias [11] proposed a multi-criteria model to evaluate users' satisfaction on e-learning program using linear programming to measure a satisfaction index and to compute criteria weights. In another study researchers used Kano two-way quality model to measure e-learning system satisfaction of users [12]. In her recent study Lee-Post [13] interpreted the success model of DeLone and Mclean was into an e-learning success model stating the related metrics of the model as in Table 2.

Table 2. E-Learning Success Metrics

Systems quality	Information quality	Service quality	Use	User Satisfaction	Net benefits
. Easy-to-use	. Completeness	. Prompt	. PowerPoint	. Overall	Positive aspects
. User friendly	. Well organized	. Responsive	slides	. satisfaction	. Enhanced learning
. Stable	. Effectively presented	. Fair	. Audio	. Enjoyable	. Empowered
. Secure	. Of the right length	. Knowledgeable	. Script	. experience	. Time savings
. Fast	. Clearly written	. Available	. Discussion board	. Overall success	. Academic success
. Responsive	. Useful		. Case studies	. Recommend	Negative aspects
	. Up-to-date		. Practice problems	others	. Lack of contact
			. Excel tutorials		. Isolation
			. Assignments		. Quality concerns
			. Practice exam.		. Technology
					Dependence

As in the above examples, there are research studies trying to establish a model to determine the success metrics for e-learning related with satisfaction of usage. In those models satisfaction is considered as a function of interaction between users and system or services provided via these systems. End results and outcomes fitting to user expectations and requirements are defined as the criteria of the success. In those studies, the system –user interaction is mainly focused on the side of the students rather than the instructor [29]. Hence, we need to discover the user satisfaction regarded to the social aspects of interaction with the system focusing on the other users like instructors. There are limited research studies clearly identify faculty satisfaction for e-learning systems and no model showing the role of the instructors' satisfaction in the e-learning success models. Additionally a researcher indicates work satisfaction and its related entities such as payment, environment and benefits are very important factors for the business success [14]. Hence the educational institutions and policy makers should consider faculty satisfaction in order to success in their activities and operations such as succeeding in e-learning systems and the factors effecting the faculty satisfaction should be investigated in more detail.

1.1. Faculty Roles in E-Learning Systems

In order to clearly understand the instructors' satisfaction in e-learning systems there is a need to propose the instructors' roles and interaction in these systems. A framework showing the interaction that could be emerged in e-learning systems , interaction types and structures as well as well as the possible players or participants in typical e-learning systems has been provided to literature [15]. Within help of such a framework the roles of instructors and students in online learning environments, web based tools usage such as discussions tools, learning developing and management tools, interaction types can be described in a use case diagram in Unified Modeling Language (UML).

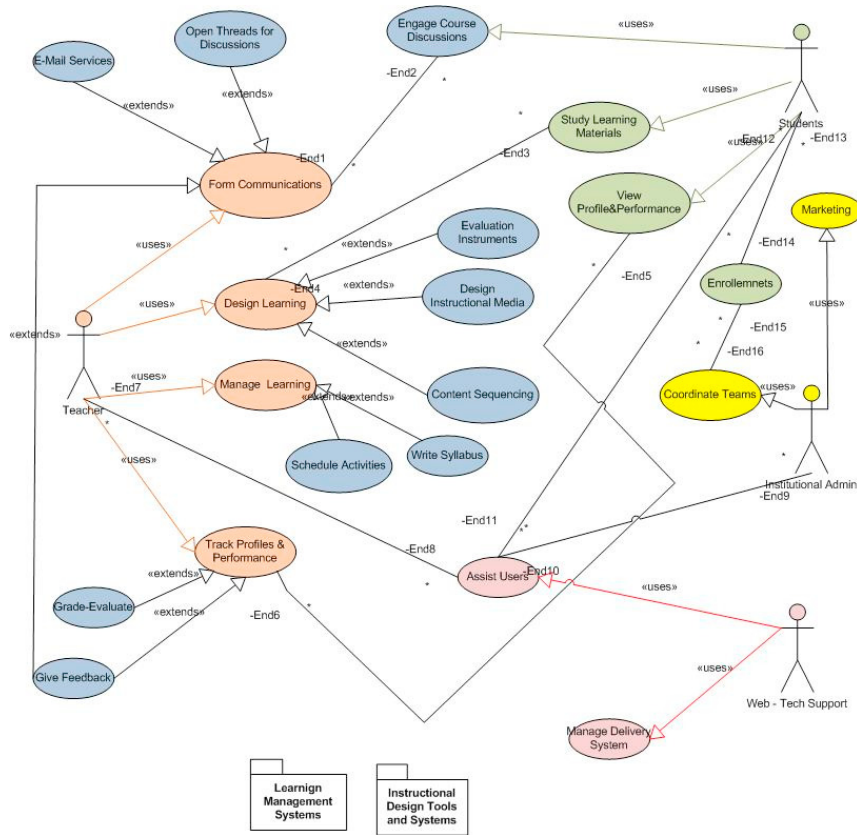


Figure 1. Use Case Diagram of E-Learning Interactions

A use case diagram for e-learning interaction typically can show a graphical overview of the functionality of the e-learning system in terms of actors , their goals as use cases and dependencies between use cases[16]. In Figure 1 a use case diagram shows possible faculty interactions in e-learning systems.

2. Factors influencing faculty satisfaction and Solutions:

After revealing the instructors' interactions and roles it is easier to understand the possible levels where they could have positive or negative satisfaction. Boliger and Wasilik [17] describe the instructors' (faculty) satisfaction under three levels which are student related, instructor-related and institution-related. In their study, they describe

that student related satisfaction is effected by faculties’ perceptions about e-learning systems net benefits. For example, faculties like to teach online because they perceive that online education gives an opportunity to access more diverse student population and they think that in online learning environment the communication ways are highly interactive with students [18, 19]. On the other hand some of the faculties may perceive these learning environments are less insufficient for communication then the face to face traditional lectures [20].

Boliger and Wasilik [17] categorized the instructor related positive satisfaction factors as faculties perception of e-learning as an intellectual challenge, and an interest in using technology .On the other hand they indicate that faculties seeking reliable and stable technologies to perform their tasks and they might dissatisfied when they cannot perform these tasks because they cannot use it .

Finally the institution related satisfaction factors are basically focused around work load procedures, intellectual property protection policies, rewarding systems and policies of the institutions [17]. Additional to the institutions policies their approaches to the technology support are also could affect faculties’ satisfaction. Seaman [21] exerts results of a national faculty survey conducted by APLU-SLOAN National Commission on Online Learning [26] and he proposes that the faculties believe that their institutions are not providing enough support to ensure the quality of instruction. He adds that faculties are not satisfied with institutions incentives of developing and delivering online courses as well as the technological infrastructures.

Rockwell et al. [22] indicates that the most of the faculties concerning about faculty workload in distance learning programs. Faculty believes that teaching online is much more time consuming than face to face teaching. Attitudes and pre-justice on e-learning programs can result less faculty satisfaction on e-learning systems because of the net benefits are not positive in terms of workload and time. On the other hand with applying right policies the quality of the e-learning systems can be ensured and the faculties can benefit. For example, to increase the success of e-learning systems Moore [23] indicates quality factors of e-learning within the five pillars model of Sloan Consortium. According to this model the factors are learning effectiveness, cost effectiveness, access, faculty satisfaction and student satisfaction. In their model, to improve faculty satisfaction there are some set of factors provided for e-learning. Accordingly faculty should contribute to and benefit from online teaching, faculty are rewarded for teaching online and for conducting research about improving teaching online, sharing of faculty experiences practices and knowledge about online learning should be a part of the institutional knowledge sharing structure.

Also there should be parity in workload between classroom and online teaching and significant technical support and training should be provided by the institutions. Control of the procedures and the making policies are not within the hand of the faculties. This reality could create inconvenience situations for faculties and lower their satisfactions on the e-learning systems.

Additionally the infrastructure, operational systems, access and the system quality are not controlled by the faculties. However most of the time these factors integrated closely in the e-learning system and the faculty is the one of the most effected actor that uses the system regularly [24].

E-learning systems should be working properly and the administration and support teams should ensure the quality of these systems. The norms and culture of the institution is very important to support faculty in these areas. In order to establish an administrative perspective to address the barriers and problems that hinder he quality and success of e-learning systems, Cho and Berge [25] provide a list of solutions based on analysis of thirty two case studies. In this list the suggested solutions directly related faculty satisfactions are listed in Table 3.

Table 3. Solutions suggested related faculty satisfactions in e-learning systems (Cho & Berge, 2002)

<b>Adapting faculties to the e-learning technologies to overcome their fear</b>	<b>Providing adequate rewards and enough time to prepare the faculty</b>
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Providing training sessions,	Develop incentives and rewards for faculty participating in the DE program
Gradually transferring to e-learning courses	Create a detailed instructor guide
Using old –new methods together	Develop train-the-trainer session
Giving opportunities to familiarize the systems	Conduct detailed evaluation feedback with participants
Working in teams	

### 3. Putting All Together: An E-Learning Success Model for Instructor satisfactions.

In the beginning of this paper the factors on satisfaction on information systems that mentioned by the recent studies has been discovered. An application of success metrics of DeLone and Mclean [10] model on e-learning by Lee-Post [13] also has been provided; however these metrics are heavily related on students satisfactions over the system usage. There is no research showing the relations on information system or e-learning system usage and instructor satisfaction metrics therefore there is a need to discover the faculty satisfaction factors on e-learning systems usage. In this section of the paper authors presents possible faculty related success metrics related to satisfaction of using e-learning systems. In Table 4 these factors are listed according to the faculty, student and institution related interaction.

Table 4. Factors influencing faculty satisfaction on e-learning systems.

Factors	Positive	Negative
Student Related	.Accessing more diverse student population .More interactive ways of communication	.Communication is not good as it is in face to face courses. .Course quality problems
Faculty Related	Intellectual challenge and opportunity to teach in more creative ways with technology .Interest in using technology .Flexible working times .Self gratifications	.Fear of technology .Lack of understanding of e-learning .Resistance to change
Institution Related	.High quality support services and infrastructure .Positive Institutional culture and norms on participation into e-learning and recognition of work .Providing training for faculty Increase in payment.	.Workload and Time Issues .Low Student evaluations .Problems in reward systems .Issues on intellectual property rights .Lack of course material development and grants

In Figure 2. These factors are implemented in the model of DeLone and Mclean [10] in order to propose a guideline showing the relations of e-learning systems and faculty satisfaction. This relations and factors provided in the guideline can be benefitted to understand instructor satisfaction when implementing e-learning programs or managing already running ones.

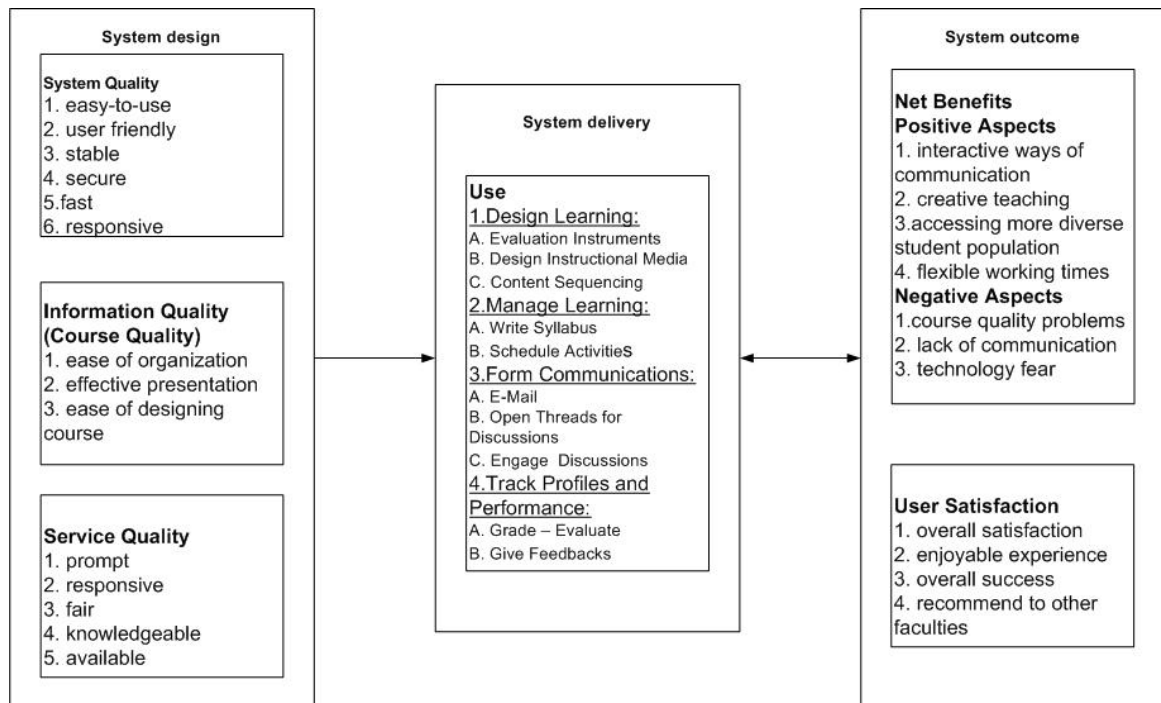


Figure 2. E-Learning Success Model for Instructor satisfactions.

#### 4. Conclusion

Satisfaction is one of the factors that affect usability of the system which also directly affect instructors' performance. In this study, factors related to instructors' satisfaction in e-learning systems have been investigated in this study. As a final product, this study provided a base guideline called "E-Learning Success Model for Instructors' Satisfactions". This model is based on social, intellectual and technical interactions of instructors in whole systems. E-learning designers, online instructors and policy makers can benefit from such a model in order to understand interaction and usability outcomes related to satisfaction of instructors.

In conclusion, "E-Learning Success Model for Instructors' Satisfactions" could be a starting point to show the related factors that could be independent variables in order to investigate this model with empirical based studies.

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