JCBI
Journal of Computing & Biomedical Informatics
ISSN: 2710 - 1606
Volume 08 Issue 02
2025

Research Article
https://doi.org/10.56979/802/2025

Effective Study of Design Perception of Learning Artifacts for Online-Learning Systems

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Received: January 5, 2025 **Accepted:** February 25, 2025

Abstract: There are several different artifacts for designing a website and they play a very prominent role in the aesthetics and inducement of any website. So, the website must look attractive and appealing to the eyes of its users. This research work is basically about revealing the aspects that directly or indirectly affect the user's cognitive beliefs, emotions, and feelings while using the website, whether the website's attributes lead to positive emotions such as satisfaction, ease/convenience to use, and appealing or the negative emotions such as frustration, irritation, satisfaction, or annoyance. The actual focus is on web-based learning applications to make them less frustrating and more appealing, especially for the students as well as teachers. For that, two learning websites are taken "Coursera and Edx" and analyzed, the analysis is based on a survey after letting the participants use these websites to get their cognition towards these websites, and after that user's perception/preference was conducted by finding the relationship between the attributes of both of the websites. Some artifacts that mainly tried to hit are aesthetic aspects (color, typography) and information architecture (content quality, navigation, interactivity).

Keywords: International Organization for Standardizationl; Business to Consumer; Information Design; Navigation Design; Visual Design

1. Introduction

The design of commercial and educational websites is a critical and emerging issue in the area of human-computer interaction. Learning online and dealing with users via a website interface is a difficult task for online service providers. For that, the design of an e-learning website could be attractive, appealing, and convenient to navigate. This is because improved usability and aesthetics of a learning website impact the learners' adaptation behavior.

Crime The websites are developed and adopted in various domains and facilitate the users to perform various activities, such as entertainment, communication, investigation/ exploration, and learning. Thus, the users do not just explore the Web for particular data, they additionally surf it for amusement, stimulation, and socializing [1]. So, in any kind of website, individuals just require it easy/convenient to use. Convenience refers to the assistance and practices of web-based learning or shopping websites that diminish users'/consumers' time and efforts in educational activities or transactions. For example, content search, personalization, customization, course registration, online assessment, and examination.

Designing a good learning website has become a primary and pivotal issue, especially for those service providers, who are working in a competitive environment and want to enlarge their market share by developing and offering their online learning services via engaging with interactive interfaces. Thus, it is very difficult to assure the success of a learning website or system, because the website characteristics and

its interface may depend on the context of use, language, gender, activities, and culture. These differences are heavily connected to who the focused users are. Website usability, user performance, contents, and aesthetic aspects are important to seek user preferences towards online learning websites and adaptation [2].

1.1. Design Artifacts and Learning Applications

Web-based learning empowers more understudies to approach the distance-learning climate and furnishes understudies and educators with exceptional adaptability and accommodation [3]. Online innovation is many times the innovation of decision for distance training given the convenience of the instruments to peruse the assets on the Web, the general reasonableness of getting to the omnipresent Web, and the straightforwardness of conveying and keeping up with assets on the World Wide Web. Many complex electronic learning conditions have been created and are being used all over the planet. Distance training is a field where online innovation was immediately embraced and utilized for course conveyance and information sharing. Regular electronic learning conditions, for example, Virtual- U [3] and Web-CT [1] incorporate course happy conveyance devices, coordinated and offbeat conferencing frameworks, surveying and test modules, virtual work areas for sharing assets, white sheets, grade revealing frameworks, logbooks, task accommodation parts, and so forth. In a virtual study hall, instructors give assets like text, sight and sound, reproductions, and moderate and enliven discussions [4]. All the learning websites are varying in their attributes and services apropos to attract users in different ways.

In this research paper, we employed two real-time learning websites with almost relevant content and interface design aspects that are Coursera and Edx to refute and analyzed their design aspects concerning user cognitive beliefs and emotions. To seek the design implications both subjective as well as objective assessments have been carried out in the current empirical study. It is an effort towards the improvement of the online educational system by providing the likes and dislikes of the users to web developers, so they can develop their future learning site under those considerations.

1.2. The Research Problem

Many online websites are providing different services such as entertainment, e-commerce, learning, etc. And every developer wishes to earn more profit in the competitive environment of a limited market. Firstly, they should know what a good website is and how it should attract and assist users. Usability testing is one good way to analyze the effectiveness and usefulness of a website. This research work will do the same thing on two learning-based web applications to know which one is more efficient in its use, how and why it attracts the users, which attributes are more appealing than in other websites, and what are the factors that made that website easier to use. However, a lack of evidence exists in the elegant literature that discussed the appropriate selection of design features for interactive learning, especially the role of aesthetics rarely discussed in the context of online learning.

1.3. Contribution of the Study

This research work is helpful to provide effective design guidelines for e-learning website systems to enhance online individuals' interactivity. These design guidelines include the important interactive artifacts or elements used to develop learning interfaces for appropriate learning activities. Data Mining and Knowledge Discovery in Crime Forecasting.

1.4. The Objectives of the Research

The prime objective of the current investigation is to seek the preference of design attributes for online-learning systems to heighten individuals' learning intentions.

We found the relationship between all the above-mentioned attributes and a comparison between both of the applications regarding their attributes to investigate the preference/perception of the users.

1.5. Research Questions

RQ1: To seek the difference between both of the websites with respect to aesthetic aspects?

RQ2: To seek the difference between both of the websites with respect to information Design?

RQ3: To seek the difference between both of the websites with respect to Navigation Design?

2. Literature Review

2.1. Human-Computer Interaction

In the field of HCI, for designing and implementing variations in computing systems, Researchers have

focused attention on the healthy interaction between people and computers as a key element. Design, evaluation, and implementation are the major concerns of HCI for the contentment of users by providing ease of use [5]. HCI works to comprehend and develop interactions between humans and machines. Human collaboration is using technology to get closer, synchronize and coordinate to an increasing extent [6].

HCI also called Man-Machine interfacing or interaction, the concept of HCI automatically appeared with the appearance of a machine or computer. The reason is very clear that most advanced machines are useless if they are not appropriately used by humans. Two major concerns must be considered while designing HCI: functionality and usability.

The reason why a system is designed is explained by what is the purpose of the system, what can it do, and how the different features or functions of the system can help achieve its goal of the system. A system's functionality is defined by the set of services and actions it provides to the users. So the value of functionality is observed when it can be successfully and productively used by the user. Functionality and usability must be properly balanced to achieve the effectiveness of the system.

Having these considerations and concepts in mind that system, machine, and computer are usually used conversely in this context, the design of HCI must create a suitable match between the user, machine, and desired services regarding performance achievement both in optimality and quality. It is mostly subjective and also depends on the context to determine which factors make a certain HCI design best to implement. The existing technology can also affect how the same purpose can be achieved by the different types of HCI design. One example is by using menus, commands, graphical user interfaces, or virtual reality to evaluate the functionalities of any particular system.

Using computing systems had always requested the query of interfacing. The methods by which people can interact with computers have reached beyond the count. This journey is still on the way and developments in technologies and new designs of systems come into sight every day, that's why the research in this area is extending very fast over the last few years.

2.2. Existing HCI Technologies

HCI design should be useful by considering many characteristics of human attitude and behavior. The available interfaces vary in complexity because of usability/functionality and the economic and financial perspectives of the system in the market. For example, an electrical kettle requires not to be highly advanced to a high degree of complexity in the interface because its only usefulness is to warm up the water and it would not be savvy to have an interface more than a thermostatic on and off switch. Additionally, a simple website that has limited functionality should be complicated in usability to engage and keep its customers.

Thusly, in the framework of HCI, the degree of activities that incorporates a client with a machine should be thought of. The client's activity has three unmistakable levels: physical, mental, and successful. The actual perspective concludes the mechanics of participation among humans and PC while the scholarly point oversees ways that clients can fathom the structure and partner with it. The brimming with powerful perspective is a later issue and it attempts not solely to make the connection a great encounter for the client but moreover to impact the client such that make client continues to utilize the machine by changing attitudes and inclinations toward the client [7].

3. Usability

Generally, usability alludes to website design and its practicality. Ranganathan et al. have identified that advanced and perfect content and functionalities of a website enhance customers' satisfaction levels and as a result, it enhances the return rate. Anand et al. mentioned that usability enhancement also depends on customized content or products. Hausman and Siekpe accentuate that informational and knowledgeable contents are more important for usability factors. Zeithaml et al. emphasized that search capability, navigation, and downloading speed also take part in improving website usability. Anand et al. identified that a website must be equipped with a user-friendly interface and it must be easy to use. Belanger et al. proposed that search functions must be speedy, detailed, and perfect in a website. Anand et al. proposed that a website must reflect the productive contents and interactive structure [38]

We want to consider that clients would rather not spend more than several minutes learning the way how to utilize a site, and an intriguing use case can be internet business sites. The initial feeling and

experience of purpose are basic and could decide the item's prosperity [44] [42].

Usability can be examined in two different ways: pre-use usability and user performance. Pre-use usability is the concept in which the user perceives by reviewing the website design or interface attributes before its actual use, while user performance commits to the task completion time and outcome of user tasks on web site over a given period and a degree of specific task completion by a user. User performance can be measured by task completion time. Therefore, there is a strong relationship between usability and user performance. Generally, the definition of usability by ISO is, it's a measure of performance by a user, activity, and state. Furthermore, Levy and Nielsen [39] demonstrated that user production or performance is one of the major influence of usability, Dillon [45] stated that usability can be monitoring the way a user interacts and appropriately use the system and noting their performance as a task completion time.

A preferable and good website is traditionally defined by linking it to user and usability. A successful website is generally one with a higher usability factor, which is user-centered and user-friendly, and has a functional perspective. According to ISO usability is explained as a result or outcome "the degree to which a system/product can be used for a specific purpose by a specific user with efficiency, satisfaction, and effectiveness in a specific context of use". Additionally, Rosson and Carroll explained usability as "the quality attributes of a computer system concerning ease of use, ease of understanding and user contentment", and Nielsen described that usability is interconnected with efficiency, learnability, memorability, satisfaction, and errors [40].

3.1. Usability and Website Usability

Usability has become an important subject broadly studied in the HCI field. Researchers have put great stress on the healthy interaction between man and machine because it's the only key element for introducing a great variety in the design and implementation of computing systems. Usability is defined as the degree to which a system or product can be used efficiently, effectively, and satisfactorily by a specific person for a specific reason or purpose.

E-business websites have dynamically developed and the world wide web has turned out to be the most powerful and commanding interface, usability researchers have executed the fundamental usability concepts to the web interface, and by using this approach they have developed usability matrices, tools, guidelines, and web-specific technologies. In the specific conditions or state of web use, usability can be defined as the degree to which a specific user can use the system/product/service to its best, which means efficiency, effectiveness, and satisfaction of the user must be achieved. Effectiveness describes the precision, correctness, and accomplishment of the goals of online users, for example, purchase, and data collecting while traversing the website.

It is linked up to excellent performance or processing so that online consumers can do and have whatever they want to while traversing the website. For example, users can achieve their objectives with very few or no errors if the website has given admirable navigation attributes, clear, colorful, and striking images, and related information with its depth. Efficiency is going through the resources for achieving goals while visiting the website. The user can judge efficiency when they can achieve their objectives without any headaches such as mental, intellectual, and physical efforts. For example, users notice efficiency in a user-friendly website with simple, clear, and uniform design attributes across all the pages of a website that makes the information on these consistently featured pages easy to read and understand. Lastly, satisfaction is the comfort level of the users. User acceptability is the most important concern of the user and the website as well. Satisfaction can be expanded if the website gives a variety of choices to engage and assist the user such as real-time messaging with the user and trustworthy, established, uninterrupted, and security-guaranteed services. Website usability is assumed as an umbrella that encompasses efficiency, effectiveness, and satisfaction [43].

3.2. Identifying Website Usability Constructs

Many appreciable attempts have been increased to analyze and classify the website usability aspects to evaluate the impact of website usability measures on online customers' attitudes and viewpoints. Firstly, In the HCI field, researchers have suggested many usability aspects to assess the quality of a website design. The researchers have applied many engineering techniques to discover the set of rules, concepts, and practices that make sure web design usability. Gherkin and Turban defined navigation effectiveness, page loading, downloading time, outstanding search rate, error rate, task completion time, and the number of times a cursor moves as usability measures. Schubert and Sells recommended hypermedia presentation,

availability, system performance, personalization, and interactivity as the key elements for the optimal design of a website. Secondly, skillful website designers also suggested many other usability aspects. Such as spool et al proposed ease in use, information quality, readability, pleasure, successfulness, accomplishment, and relevancy. Nielson proposed navigation, reliability, response time, and information quality. Many other companies have also specified the design guidelines for website usability such as IBM and Microsoft. Microsoft proposed five basic usability elements as a guideline such as ease of use, advancement, made-for medium, and feelings [43].

3.3. Relationships between Website Usability Constructs and Online Learning

Researchers have explored the connection among usability constructs and various resulting variables including attitude towards a website, intention (to buy, visit, use, further navigation), activity (actual buying, use, revisit, suggest to friends), and others such as pleasure, liking, devotion, and bonding. Previous studies reveal many facts and a good understanding of the influence of websites on the behaviors and perceptions of online clients, those e- businesses were discouraged because they applied indirect performance measures such as used user behavior, the intention of using or revisiting the site, and the frequency or period of using the website instead of actual purchase measures (or such intentions). Meantime, e-business managers and crews invested a great amount in their online store websites in the way to improve the design quality and to make sure a great and positive relationship between quality in design and customer buying. By considering purchase intentions and actual purchase as derived variables, trials are made to check the direct influence of website usability [43].

3.4. Testing Tool

Usability is the main abstraction in HCI. Among all other definitions to explain the term, usability is “the ability to be used by users in easy, productive, and efficient manners”, “Excellence in use” [41], and “productiveness, efficacy, satisfaction, and efficiency with which a specific user can reach his/her goal in any intended environment”. Generally, its attributes are highly considerable when preferring a product or service [42] the size of usability is analyzed from the purchaser mindset formation point of view [2]. Researchers calculated usability using task completion time, the range of user errors, memory demands, memory recognition, and recall, the number of overused images, and insufficient links [43].

3.5. Developing A Website

The designers of all categories usually design the web by making use of pencil and paper sketches, whether they design a new building, any kind of product, machinery, advertisements, or computer applications. These designs enable the designers to think extensively while making their concepts clear about the new attributes in the early phases and engage the designers and any other people with whom they discuss their initial thoughts and plans by concentrating on the things that are not yet important. But now some developers are focusing on making tools for website designers for eliminating the need for sketchiness in the early phases. The term content design was utilized to allude to the issue of distinguishing the collection of related items of information and coherently organizing the data. In the section on closely related items, navigation designs allude to the design of techniques for discovering one's way around the content structure. Graphic design that is also called visual design, alludes to the visual correspondence of data utilizing components, for example, colors, pictures, typography, and format. While content and navigation designs concentrate on the whole Web site and the connection or link among large-scale components, for example, pages inside the website, visual or graphic design concentrates basically on the presentation of individual components. Information architecture is the combination of navigation and content design.

3.6. Website Design

Web attributes are the characteristics and feature a website is made from. They vary from system to system and user to user, some of them are identification, characterization, coverage, accuracy, functionality, control, reachability, interactivity, correctness, maintenance, accessibility, navigability, understandability, resources, information, and communication technology concerning identity, content, services, location, management, usability, and feasibility.

3.7. Aesthetic Aspects (Visual Design)

The importance of aesthetic aspects has been recognized in the area of HCI. In late reviews, aesthetics for appeal and consistency in the design of the website appearance have been examined [17], [18], and [19]. As per Liao et al. [18], aesthetic and appealing elements can strengthen client perception of the convenience

and adequacy of a website. These elements are identified with appearance and can be classified into color, representation, textual style, etc. Similarly, in the research by Fog et al. [20], they argue that customers made their views or judgments about the website's validity and efficiency based on its design, consisting of "format, typography, text size and style, and color scheming". Several different reviews examined the significance of aesthetics and quality of the design for satisfaction and trust [19] [21].

3.8. Typography

It relates to the appearance, appeal, and readability/understandability of the text of the website to get user attention. The fascination and appearance of the website relate to typography [22]. Arranging the written data in a proper and readable way is just an art. Accordingly, good quality typography strengthens the significance of a website, the understandable and proper meanings of the words, and how users perceive them must be a major concern, though low-quality typography puts a negative impact and affects learnability, as an outcome, it creates visual confusions for the readers. Subsequently, typography empowers the users to encounter the site with joy and reduces the reader's time to explore, understand and get to the required data. To facilitate reading content and effective communications through the website, typographic elements have great importance. It is also important to get the user's satisfaction, especially in e-commerce and learning-based web applications. Nielsen proposed that the small size of the font and poor color contrast is always criticized in online content reading. That is why clients like the text style they acknowledge and complain/criticize those they don't like. Another component that influences the suitability of typography is the letters, words, and line spacing.

3.9. Information Architecture

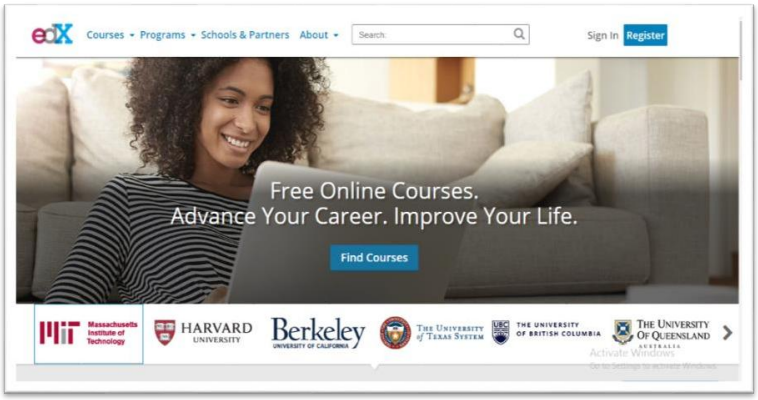

Figure 1. Edx

Content quality, interactivity, and navigation are some of the website attributes that are associated with organizational structure and layout [26]. Structure deals with information presentation or how the data is displayed on a webpage and how the web pages are structured or organized.

1. Content Quality
2. Interactivity
3. Convenience/Navigation

4. Materials and Methods

In the current research, working online learning systems are adopted to refute the proposed hypothesis. The objective is to determine the design attribute implications on individuals' emotions (positive and negative) and cognitive-affective beliefs to minimize cognitive complexity. To collect the subjective and objective measures, the researcher employed university students as well as teachers to share their perceptions and experience of the adopted online learning website. The individual's experiences and perceptions were particularly related to design artifacts and their preciseness. To deal with the collected data statistical techniques such as multi-regression analysis and pairwise analysis were used to seek the relationship between employed constructs. The subjective measure was adopted and modified from the elegant literature, where the objective measure was collected in terms of task efficiency. The study "Effective Study of Design Perception of Learning Artifacts for Online-Learning Systems" was a quantitative research type. The research study was exploratory.

Figure 2. Coursera

4.1. Population

The population of the study comprised university students as well as teachers who are using or have used the mentioned applications. The expected sample size was

>500 participants for each application but the total responses were 248 and 269 to Coursera and Edx respectively. The bifurcation of the whole population is bellowed.

1. University of Agriculture Faisalabad
2. University of Central Punjab
3. Riphah International University Faisalabad
4. NFC Faisalabad
5. National Textile University Faisalabad
6. Government College University Faisalabad
7. FAST Faisalabad

4.2. A Sampling of the Study

The total sample was 517 participants from different universities in Faisalabad. The sampling technique used for data collection was convenient sampling.

4.3. Instrument of the Study

In the exploration, the determination of an instrument relied upon the idea of the issue to be contemplated. In the wake of fostering the poll, the specialist regulated the survey to take a look at its legitimacy. The dependability of the instrument is 0.769. This survey was produced for the users of mentioned learning websites.

4.4. Data Collection

The study was to search out the "Design Perception/Preference of Learning Artifacts for Online- Learning Systems" For this purpose two questionnaires were developed for the participants. The researcher personally hit the places and got the questionnaires filled. Distributed the questionnaires to 500 participants from different well-known universities in Faisalabad.

4.5. Data Analysis

Collected after the collection of the data, it was arranged and analyzed. Data were analyzed by software SPSS 22 and regression analysis frequency, percentage, mean score, standard deviation independent sample t-test Statistics were applied to interpret the results. The sample size was 517.

5. Results and Discussions

5.1. Descriptive Statistics

Table 1. Group Statistics

	Prototype	N	Mean	Std. Deviation	Std. Error Mean
ID1	1	245	2.46	1.574	.101
	2	161	2.35	1.394	.110
ID2	1	246	2.55	1.392	.089
	2	164	2.49	1.345	.105
ID3	1	246	2.74	1.649	.105

	2	164	2.59	1.253	.098
ID4	1	247	2.55	1.430	.091
	2	163	2.61	1.244	.097
ND1	1	245	2.55	1.540	.098
	2	164	2.79	1.341	.105
ND2	1	245	2.69	1.469	.094
	2	164	2.79	1.265	.099
ND3	1	247	2.70	1.544	.098
	2	163	2.84	1.392	.109
VAD1	1	247	2.75	1.541	.098
	2	163	2.91	1.425	.112
VAD2	1	246	2.65	1.533	.098
	2	164	2.85	1.323	.103
VAD3	1	245	2.64	1.592	.102
	2	164	2.67	1.278	.100
VAD4	1	246	2.72	1.572	.100
	2	163	2.79	1.249	.098
VAD5	1	245	2.74	1.516	.097
	2	162	2.80	1.296	.102
VAD6	1	245	2.96	1.618	.103
	2	162	2.90	1.375	.108

*ID = Information Design
*ND = Navigation Design
*VU = Visual Design

Table 2. Independent Samples Test

	Levene's Test for Equality of Variances		**t-test for Equality of Means**				
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
ID1	3.683	.056	.702	404	.483	.107	.153
			.720	370.169	.472	.107	.149
ID2	.253	.615	.440	408	.660	.061	.138
			.443	357.597	.658	.061	.138
ID3	11.381	.001	.993	408	.321	.150	.152
			1.048	401.015	.295	.150	.144
ID4	4.950	.027	-.384	408	.701	-.053	.137
			-.395	378.213	.693	-.053	.133
ND1	5.290	.022	-1.664	407	.097	-.246	.148
			-1.711	380.054	.088	-.246	.144
ND2	6.432	.012	-.762	407	.446	-.107	.140
			-.785	382.107	.433	-.107	.136
ND3	3.752	.053	-.962	408	.337	-.144	.150
			-.982	370.833	.327	-.144	.147
VAD1	3.596	.059	-1.094	408	.275	-.165	.151
			-1.111	365.372	.267	-.165	.149
VAD2	4.279	.039	-1.346	408	.179	-.197	.146
			-1.386	381.919	.166	-.197	.142

VAD3	8.852	.003	-.174	407	.862	-.026	.149
			-.181	393.681	.856	-.026	.142
VAD4	14.415	.000	-.463	407	.644	-.068	.147
			-.484	393.650	.628	-.068	.140
VAD5	4.628	.032	-.368	405	.713	-.053	.145
			-.380	379.323	.704	-.053	.141
VAD6	6.150	.014	.349	405	.728	.054	.155
			.360	380.334	.719	.054	.150

Table 3. Independent Samples Test

	t-test for Equality of Means	
	95% Confidence Interval of the Difference	
	Lower	**upper**
ID1	-.193	.407
	-.186	.400
ID2	-.211	.333
	-.209	.331
ID3	-.147	.448
	-.132	.433
ID4	-.322	.217
	-.315	.209
ND1	-.536	.045
	-.528	.037
ND2	-.383	.169
	-.375	.161
ND3	-.439	.151
	-.433	.144
VAD1	-.462	.132
	-.457	.127
VAD2	-.485	.091
	-.477	.082
VAD3	-.318	.267
	-.306	.254
VAD4	-.356	.220
	-.343	.208
VAD5	-.339	.232
	-.330	.223
VAD6	-.250	.358
	-.240	.348

5.2. Discussion

5.2.1. Information Design

Table 1 shows that the mean value of the question about information completeness against the ID1 of Coursera and Edx is 2.46 and 2.35 respectively with a sample size of 245 and 161. The preference for Coursera is high in terms of information completeness but we performed statistical analysis to identify the significant difference by applying a T-test (F=3.683, sig. =0.056) (table 2). A significant difference exists if the value of sig. is equal to or below 0.05. So we can say that the preference for Coursera was higher than Edx and also the information was more structured in Coursera than Edx.

The mean value of the question about the sufficient information against ID2 of Coursera and Edx was 2.55 and 2.49 Respectively Significant differences were identified by conducting statistical analysis. The results (F=0.253, sig. = 0.615) show that Coursera is more preferred than Edx.

The mean value resulting against information effectiveness was (coursera=2.74, Edx= 2.59). After applying statistical analysis, the results were good for Coursera (F=11.381, sig. =0.001). So the preference of

course was higher regarding information completeness.

The mean values of the applications against the question "The website adequately meets my information needs" was (coursera=2.55, Edx=2.61). After its statistical analysis, the results (F=4.950, sig. =0.027) show that Edx was preferred over Coursera.

5.2.2. Navigation Design

The mean value about navigation design against the question about "easy navigation" was (coursera=2.55, Edx=2.79). The results of statistical analysis were (F=5.290, sig. = 0.022) which shows the high preference of Edx over Coursera.

The mean values of Coursera and Edx against the question about "easy to use" were (coursera=2.69, Edx= 2.79). A big difference in perception and preference can be seen in the values but after conducting statistical analysis, F=6.432, sig. =0.012) that shows Edx is preferred over Coursera.

The mean value of the question "navigational facilities" was (coursera=2.70, Edx=2.84). The statistical analysis (F=3.752, sig. =0.053) shows the significant difference that Edx is more preferred in terms of navigation design.

5.2.3. Visual Design

The mean values of both of the applications against the question of the "degree of interaction" were (coursera=2.75, Edx=2.91), and its statistical analysis (F=3.596, sig. =0.059) shows the significant difference that the user's preference and perception of Edx were better than Coursera.

The mean values of both of the applications against the question "efficiency in fulfilling the specific needs" were (coursera=2.65, Edx=2.85), and its statistical analysis (F=4.279, sig. =0.039) shows the significant difference that the user's preference and perception of Edx were better than Coursera.

The mean values of both of the applications against the question about the "professionally designed website" were (coursera=2.65, Edx=2.67), and its statistical analysis (F=8.853, sig. =0.003) shows the significant difference that the user's preference and perception of Edx were better than Coursera.

The mean values of both of the applications against the question about the "attractive screen design" were (coursera=2.72, Edx=2.79), and its statistical analysis (F=14.415, sig. =0.000) shows the significant difference that the user's preference and perception of Edx were better than Coursera.

The mean values of both of the applications against the question "meaningful animations" were (coursera=2.74, Edx=2.80), and its statistical analysis (F=4.628, sig. =0.032) shows the significant difference that the user's preference and perception of Edx were better than Coursera.

6. Conclusion

We have found the user's perception and preferences of two learning applications by conducting a survey and also found the user-friendly attributes of both of the websites by comparing them regarding Information Design, Navigations Design, and Visual Design.

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