What motivates online learning? A comparative study of online and offline motivations

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ABSTRACT
E-learning is fast becoming a choice for learners in various domains. E-Learning as a choice, especially in developing countries, has a potential for the users and an opportunity for the HCI designers. In order to capitalize on this opportunity, it will be helpful for HCI designers to look at the attitudes/motivations that make online learning preferable along with attitudes/motivations that make the offline learning preferable. This research paper reports both quantitative and qualitative methods used to understand the attitudes and motivations. While attitudes have been measured using the semantic differential technique, the motivations have been dug into using deep probing with unstructured and open-ended qualitative interviews.

Author Keywords
HCI; online learning; offline learning; motivations.

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INTRODUCTION
E-learning is a potential way forward, especially for the developing world where the numbers of aspirant learners far outnumber the resources. Online mode is likely to be preferred for the reasons of increasing instructional productivity and reducing costs without potentially sacrificing educational quality if the HCI designers get the flow right. While online learning has the advantages of being efficient and cost effective, the offline system has been argued to better in terms of valuable person-to- person interactions [1]. There is a need of literature reporting the differences in user preference between the online and offline modes. Not much literature has been published about the attitude and motivations, especially on the basis of first hand user reports. The need for such a study is acute due to the potential for the online learning in the developing world. Several reports in literature have focused on mental and physical preparedness in developing worlds to accept the online learning [2].

The approach this paper has taken towards understanding the user attitudes and motivations is by collecting connotative meanings from users perspective and conducting qualitative interviews on first hand experiences of users. The aim of conducting the qualitative interviews was to identify the drives users have towards or against the online learning. As a contrast, offline learning has been used during the data collection to bring clarity in the drives. From some users, connotations of 'online' vs. 'offline' learning were collected using semantic differential technique and then another set of users were interviewed for their experiences in using online medium of learning. Detailed, unstructured, open-ended qualitative interviews were used to probe deeper into the subconscious drives for selection of online medium over offline medium for learning.

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SEMANTIC DIFFERENTIAL TECHNIQUE
Semantic differential method was reported by Osgood to measure the connotative meanings. Personal meanings could be denotative or connotative. Words like 'pen' denote an object while words like 'honesty' may connote 'softness', 'politeness' etc. Based on science of semantics, Osgood has presented a case for measuring connotative meanings, which can reflect an individual attitude towards objects or situations. The data gathering technique is called 'Semantic Differential' and has been used extensively in different domains ever since its introduction. The semantic differential uses bipolar scales to get connotative meanings. The analysis techniques further developed have pointed out that such meanings can be categorized in broad three subgroups of recurring attitudes that people use to evaluate words and phrases. These three sub groups are named as evaluation, potency and activity. An 'Evaluative Factor' can be represented by scales such as good-bad, pleasant-unpleasant etc. A 'Potency Factor' can be represented by scales such as strong-weak, hard-soft etc. and an 'Activity Factor' can be represented by scales such as fast-slow, excitable-calm etc. [3]. Total of 20 items were created to measure the felt connotative meanings related to the offline and online learning. Users were asked to rate these items on a bipolar 7-point scale. Total of 40 items were rated, 20 for online and 20 for offline, both the sets were same but displayed on two different sheets of paper. The scales had mixed items from all the three subgroups of evaluation, potency and activity. The findings have been further discussed in results section.

QUALITATIVE RESEARCH METHOD

Psychology as a branch of knowledge has been long interested in understanding first hand user experiences. Though qualitative techniques had taken a beat in the middle years due to accusations of 'subjectivity', 'bias' etc., in last two decades, the qualitative techniques have seen a rise not only in fields of psychology and allied domains but also in interdisciplinary research domains.

Sigmund Freud has been often regarded as the protagonist of the psychoanalytic research techniques. The psychoanalytic techniques had open-ended deep probing interviews at its core, which had later inspired Piaget and Adorno, and of late have been in vogue in interdisciplinary sciences [4].

This paper has used the open ended deep probing methods inspired by the psychoanalytic interview techniques. Interviews started by asking the participants about a recent memory of having used E-learning in any domain of their interest. The typical opening question would be "when was the last time that you learnt something online…". The interview would then progress by asking some close ended questions like 'was it alone or with someone", "what time/place was it". The interview would then slowly develop into open ended discussion with questions like "how was it for you", "you were telling that … can you help me understand it" etc. The aim was to speak minimum, not ask any direct questions and develop upon the answers of the participants for further probing. This required the necessary skill at interviewing by the researchers and the researchers practiced this sufficiently till gained confident to conduct the interviews.

The qualitative interview technique was used to gather data for the second half of the study reported in this paper. This technique involved individual interviews of about one hour with each participant to explore their experiences and underlying motivations towards online learning.

The motivation-appraisal theory has emphasized that the individuals perform an action under a certain motivation. If the motivation gets positively fulfilled by the action then there is a positive appraisal leading to a positive emotion towards the situation and creates the likeliness of the action being performed repeatedly. This repeated action was the topic of interest in this research and the aim was to identify the motivations for the repeated action of online learning. While the users of the online learning systems make a definitive choice in the process of deciding about learning, it will be useful to understand the motivations behind such choices by users. Such an understanding would provide suggestions to creative HCI designers on layout designs, navigation and content design, graphics and imagery selection etc.

METHODOLOGY AND MATERIALS

As discussed earlier, two separate methods were employed for the two types of observations in this study. Initially quantitative ratings were obtained using 7-point bi-polar scales in semantic differential method eliciting personal connotative meanings of E-learning and offline learning. Then a qualitative study was applied where unstructured personal interviews with deep probing was used to elicit verbalized experiences about motivations for online learning. Details of stimuli, subjects and settings for the studies are reported below.

Semantic Differential Study

Participants were selected on the basis of their prior experiences with online and offline learning. Participant selection filtered in the subjects who had some recent prior experience of learning from both online and offline mediums. The participant profiles are listed in Table 2. Participants were given printed on A4 sheets bipolar rating scales with total 20 items for online and 20 items for offline learning on two sides of the same sheet. Participants were asked to tick one of the seven boxes spread between the two opposite poles of the scales based on their experiences. The scales were created to include items from all the three subcategories of the Osgood analysis. Table 1, summarizes the items along the 3 subcategories.

Evaluative	Potency	Activity
Dull-Vibrant	Hard-Soft	Difficult-Easy
Excitable-Calm	Heavy - Light	Fast-Slow
Sad-Happy	Lax-Domineering	Exciting-Boring
Unpleasant-Pleasant		Simple-Complex
Right-Wrong		Active-passive
Good-Bad		Demanding-Undemanding
Wise-Foolish		Emotional-Unemotional
Friendly-Unfriendly		Problematic-Unproblematic
Sociable-Unsociable		

Table 1: Semantic differential bipolar scales

More scales of 'Evaluative' category followed by 'Activity' category were used as 'attitude' is suggested to be measured by the evaluative category more than other two. Activity category was used to understand the 'e-learning task experiences'.

	No. of participants	Age range
Males	12	18-52
Females	21	16-51

Table 2: Participant Profiles for Semantic Differential Study

Qualitative interviews

The prerequisite for participant recruitment was that they should have taken a course or watched tutorial videos online for learning purpose within last 3 months. The

participants came from a convenient sampling based on residential proximity to researchers. All the participants were living in neighborhood apartments. Researchers asking for permission approached participants personally and the participation was voluntary without any remuneration. The majority of participants in the open ended interviews were middle aged women, from the ages of 29 to 51, who were contacted through personal connections, and later followed the snowball process to recruit subjects from among their acquaintances.

The qualitative interviews were held at the participant's homes. It was ensured that the setting chosen for interviews had soft furniture, where one can slouch in, so as to create a personal comfort zone. It was ensured that there would be least distraction in terms of visits or interruptions by other members of the family during interview. The purpose of the interview and terms of confidentiality were addressed to the participant [5].

The interviewer probed into the motivations and the emotions of the participant by asking open-ended questions about online and offline learning. It was ensured that the participants were involved and enjoyed sharing their experiences. The probes developed upon the experiences shared by the participants. The interviewer did note taking. There were no observers involved in this interview. Each interview lasted between 45 minutes to an hour. The interviewer had a friendly stance and dressed down to look and feel amicable to the participants.

Total :15	No. of participants	Age range
Males	5	23-24
Females	10	29-58

Table 3: Participant Profiles for qualitative interviews

RESULTS AND DISCUSSION

Semantic Differential Findings

In the quantitative study where Semantic Differential method was used to elicit data related to learners attitude towards online learning versus offline learning, it was observed that participants did perceive the two modes of learning as different on most of the scales. The findings have been presented in table 4 in decreasing order of difference between means on the rated scales. ANOVA was performed to check the variations within the online and offline scale ratings and the F values and P values for comparison of each pair has been listed in the table 4 against each scale. Total no. of participants for each scale was 33 and the F critical value for each pair as per the F table is 3.99. It can be observed from the table that for the top 10 scales the F value is above the F critical value and hence the differences in the attitude between online and offline were significantly different.

Scale	Online mean	Offline Mean	F Value	P value
Emotional-Unemotional	5.64	2.67	81.80	0.00
Social-Unsociable	4.70	1.88	55.73	0.00
Active-Passive	3.82	2.12	16.67	0.00
Dull-Vibrant	4.09	5.39	10.63	0.00
Friendly-Unfriendly	3.73	2.58	7.35	0.01
Hard-Soft	3.94	5.06	7.55	0.01
Good-Bad	3.06	2.03	8.19	0.01
Wise-Foolish	3.03	2.00	12.06	0.00
Demanding-Undemanding	3.91	2.97	5.36	0.02
Simple-Complex	3.67	2.76	4.86	0.03
Lax-Domineering	3.30	4.09	5.05	0.03
Difficult-Easy	4.64	5.42	3.57	0.06
Problematic-Easy Going	4.85	5.55	3.28	0.07
Heavy-Light	4.42	5.06	2.38	0.13
Sad-Happy	5.15	5.70	2.51	0.12
Right-Wrong	2.73	2.21	2.80	0.10
Exciting-Boring	3.12	2.64	1.89	0.17
Unpleasant-Pleasant	4.94	5.42	1.94	0.17
Fast-Slow	3.15	2.70	1.23	0.27
Excitable-Calm	4.06	4.15	0.04	0.84

Table 4: Online and offline mean values along with P value and F value

As the ratings were on 7 point scale where the first item on the left of the pair represented 1 and the right item represented 7. So in the 'emotional-unemotional' scale, mean of 5.67 indicates that most of the participants found online mode of learning as more 'unemotional' (closer to 7

than 1) offline as more 'emotional' (mean as 2.67, closer to 1).

To sum up the findings from semantic differential ratings, it was observed that participants found the online learning as more 'unemotional', 'Unsociable, 'Passive', 'Dull', 'Friendly', 'Hard', 'Bad' , 'Foolish' and 'Undemanding'. As the semantic differential only measures the 'connotative meanings' [3], it is difficult to directly make sense of these connotations. They only refer to an 'attitude' or a certain deep 'perspectives' towards objects and situations. The potential of such findings in improving the e-learning designs have to be further investigated. After this study, it was decided by the authors to further investigate with qualitative interview techniques to understand the motivations for choice of online learning mode. They are described below.

Qualitative Study Observations

Total of approximately 15 hours of interview was done with 15 participants. The data collected was in the form of text notes. These notes were mutually discussed and analyzed. To start with, first recurrent themes were filtered out with mutual consent of the authors. Total of 29 recurring themes were observed in the responses from 15 participants. Total count of recurrence of these thematic verbalizations was done. The authors tabulated the verbalizations and then counted the number of occurrence of the same feeling or intent during the verbalization. Though the words used to describe the feeling by the participants were not necessarily the same but in the understanding of the authors the intended meanings were very close. Such a semantic analysis of the verbalizations is the nature of the qualitative research where the researchers' involvement with the participant and his/her skills lead to content validity in the 'felt meanings'. Further, after the counts were done, the felt intensity of each description was evaluated on a scale of 10 where 10 represented maximum intensity of 'felt emotion'. After the 'count' and 'intensity' were tabulated, the 'motivations' were categorized as the 'experienced' underlying phenomena under the verbalized experiences. All the four, the motivation categories, the verbalized intents by participants, the count of verbalizations across participants and the intensity of 'felt emotion' have been tabulated in table 5.

Total of 11 such categories of motivations were identified. 'Freedom' in learning the way one wanted, occurred maximum no. of times, six times, as the motivator for users preferring to learn online. It was followed by 'Efficacy' (five times), the feeling that one will be able to perform better; 'Authenticity' (three times), the feeling that online stuff is more authentic; 'Ease of use' (three times). Interesting motivations like 'secretive learning' as *no one would get to know that I have learnt while I master something* and the learning as 'escapism and entertainment' were also observed.

Looking at the verbalized intents, "quick and easily accessible" was of great importance to four of the users. One of the participants suggested that in a fraction of second, she could search for something *using voice search*. Five users remarked that they used it for discovering alternative ways to do something they already knew. Being free of cost is also a motivating factor for three users. Three active users felt online learning was a means of refreshing oneself when you're bored of learning. To them online learning was *an entertainment while working*. Another participant remarked that online learning helped fight depression against loneliness by providing hours of entertaining learning. It also helps boost confidence when you try out something that you learnt online, as felt by four of the users.

Other motivating factors were being socially active, updating yourself with the latest happenings, engagement and variety of options.

Sl No.	Motivation category	Verbalized intents	Count	Intensity
1	Freedom	Search for alternative ways to do something that I already know how to do	5	8
2	Freedom	Step by step explanation in videos which can be re-watched whenever required	5	5
3	Ease	Quick and easily accessible	4	9
4	Freedom	No time restrictions/ Self paced study	4	8
5	Efficacy	Gives self confidence by trying out something that you learnt online	4	4
6	Options	Gives you ample options to choose the learning source	3	5
7	Updated	Keep abreast of latest happenings in the topic of your interest and discover something new which may not be available elsewhere	3	4
8	Free	It is free to use	3	7
9	Authentic	Gets a chance to follow experts in the field of interest	3	3
10	Freedom	Only uses internet in her free time, eg. only at night : when you cannot sleep, you tend to browse	3	7
11	Social	Network with students and the teacher of that course. Also builds a community	3	5
12	Freedom	People dont have time for you, easier to get away with internet and pass some time	3	6
13	Effective	You can actively remember things you read online, so online courses are effective	3	2
14	Escapism/ entertainment	Offers a way to refresh yourself when you're bored of learning, it is also entertainment with work	3	6
15	Authentic	People in my immediate environment may not know the solution	2	3
16	Ease	When I ask others, they take their time to think and respond, google is a quick reply.	2	4
17	Effective	Goes through all the questions and queries that people post - finds all her questions answered there itself / Also finds reviews to be very helpful	2	1
18	Efficacy	Getting an edge/ do a homework before actually learning it at office or in class	2	5
19	Secretive learning	Makes me look good in front of my boss and helps me deal with offie work pressure	2	5
20	Efficacy	Gets satisfaction only after implementing	2	2

		what you learnt		
21	Easy	Doesnt have to read much content, hates reading, so videos are a good way of learning	2	6
22	Easy	Doesnt need to ask anyone, self explanatory videos, can make easy things on her own	1	4
23	Engaging	A video replicates a class,where a teacher teaches something. Not the same case with books	1	2
24	Escapism/ Entertainment	It doesn't let you be alone, you dont get into depression. whenever alone, internet videos keep you entertained	1	6
25	Updated	Learning for future reference, might come to use in the future sometime	1	1
26	Freedom	Choose to accept whatever you want, watch everything but do only what is required to you.	1	1
27	Authentic	Eventually one has to go online to look for problems that arise offline.	1	1
28	Efficacy	Option of learning and implementing/ practicing it right away. The urge to implement makes me want to learn more about the course. Implementability is key	1	5
29	Efficacy	Adding a learnt skill to your portfolio: gets more work and recognition	1	1

Table 5: Participant Profiles for qualitative interviews

Design Opportunities

From the analysis of the data above, it was observed that if the design of an online learning platform could focus on authenticity, effectiveness, emotional involvement and capitalizing on feeling of freedom to learn the way one wants, then the designs would be better prepared to entice the learners and make the learning experience an enjoyable one. Some of these learnings from analysis of data have been further developed into design layouts as examples in the following paragraphs.

Bringing offline recommendations to online mediums can increase the authenticity of an online tutorials. Authors propose that one of the ways a creative designer can do this is by friend recommendations. This is indicated in Figure 1 by using a click button for recommending the video to friends. Friends in the social circle can recommend/rate courses they've attended to few select friends or all friends in network. Further it is suggested that the effectiveness of a course may depend on doubt clearance, so all the previously asked doubts can be well listed and categorized and new doubts posted by the users can be resolved by the community/network by sending them a notification about new questions. The efficacy can be improved by suggesting steps/methods, which are implementable right away. The happiness derived from a course could be improved by providing more implement ability. The participants tend to ignore the implementation if it requires effort. It can be addressed by providing a small tryout area, e.g. coding websites have a live code check where you can test out the code learnt.

The social and emotional aspect of online learning can be enhanced by personal chat options with the teacher of the course and other students, building a network of individuals interested in the same subject, as illustrated in Figure 1. Figure 2 indicates that while dealing with courses that are lengthy or tedious (more than 15 minutes long), give short breaks for entertainment/ escapism, e.g. a cat video to refresh the mind. This will also ensure that the course isn't felt to be lax. For providing more freedom, every video can be broken down into steps, which the user can use to jump to specific sections of the video if required to watch again. Providing alternative ways to do a thing can be accessible to the user immediately upon completing the tutorial, as they feel it gives them more freedom to choose. The Participant's motivation to rely on the Internet for options can be capitalized by giving a side bar with recommendations for the same thing, as demonstrated by different experts in the field.

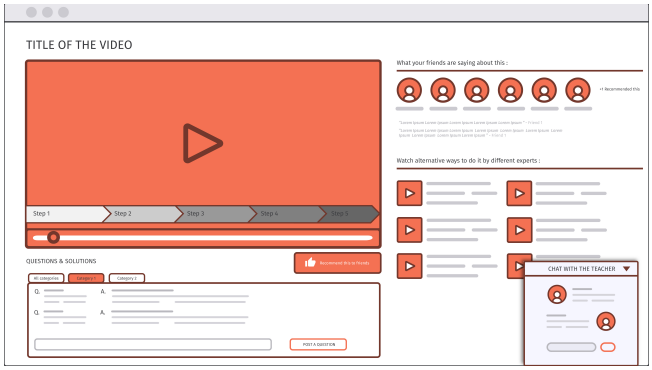

Figure 1. Wireframe to indicate design possibilities like Stepwise video demarcation, questions and solutions section, friend's recommendations and and chat with the teacher.

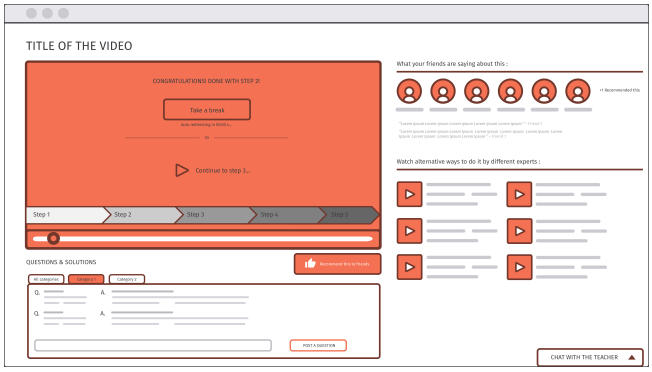

Figure 2. Wireframe to indicate entertainment break in between lectures for rejuvenation.

The above design ideas are only suggestive of some of the creative ways in which online learning can be made more desirable by the learners. These ideas were generated by brainstorming on the findings of research reported in the paper. The attitude and motivations participants had towards the online learning in comparison to offline learning gave some cues to improve the motivations towards online learning. The recommendations are neither exhaustive nor validated. A validation with users of these ideas would further throw light on their effectiveness.

Further studies into the motivations and attitudes of users of online learning mode would be helpful to the development of successful online learning courses which anyway are a demand and need. The semantic differential scale may be used with other bipolar scales for further in-depth understanding. Some of the findings from the qualitative interviews can also be used to create the semantic differential scales for further validation. A compilation of such findings in future can develop into guidelines for designers working on designs of HCI for learning.

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