

Application of Arcs Model for Utilizing Blogs to Enhance Learners' Motivation in Higher Education

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Abstract

Social networks are main contributors to enhanced learning and teaching patterns in higher education institutions at global level. Social networking sites establish awareness for the ownership of learning amongst learners. In fact motivation is an important factor in learning regardless of developing educational technologies and emerging online learning approaches. Keller (2000) focuses on the importance of motivation by arguing that accelerating and maintaining the motivation of learners, and coming across valid and reliable motivational methods is a challenge for educators. Keller presented the motivational model called 'ARCS Model' which brings together four motivational factors, having impact on gaining i) Attention of learners, ii) determining the Relevance of teaching to learning styles and learning goals of learner, iii) encouraging Confidence regarding prospects and outcomes of learning, and iv) crafting instruction satisfactory for the learners. The present study was aimed at determining use of blogs to enhance the motivation of learners towards their learning in higher education. An ARCS survey was conducted to assess the general motivation level of learners to learn through web tools and technologies. Participants of the study were registered to an online blog and whole instruction and learning activities were carried out through this blog for six weeks. At the end of 6-weeks, ARCS survey questionnaire was again administered by the participants to assess their motivation level after learning through blogs. Results demonstrated that the motivation level of students towards learning was amply enhanced as four factors of motivation i.e. Attention, Relevance, Confidence, and Satisfaction were significantly augmented.

Keywords: motivation, ARCS model, blogs, higher education

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Introduction

Digital technologies have become one of the most important features for effective education in the twenty-first century with revolutionary impact on learning and instruction. The increasing influence of new paradigms of online learning and digital teaching has transformed the ways how learners seek information and knowledge. Learners now live in an emerging information society which fulfills their requirements for all spheres of social life and modifying their learning as a social function. E-Learning has become an imperative mechanism in the new Higher Educational Environment in the digital era which establishes student-centered learning with more flexible learning modes.

Evolving web 2.0 technologies in past few years have dominated the formal ways of higher education . The higher education students get the abilities and expertise to establish different mines of information in learning process such as communication through digital communities and newsgroups, interactive videos, online discussion forums, chat rooms, wikis, blogs, facebook, twitter, LinkedIn and personal websites. "The Conversation Prism" (below) introduced by Solis (2008) demonstrates the extensive range of learning tools relating to social media.

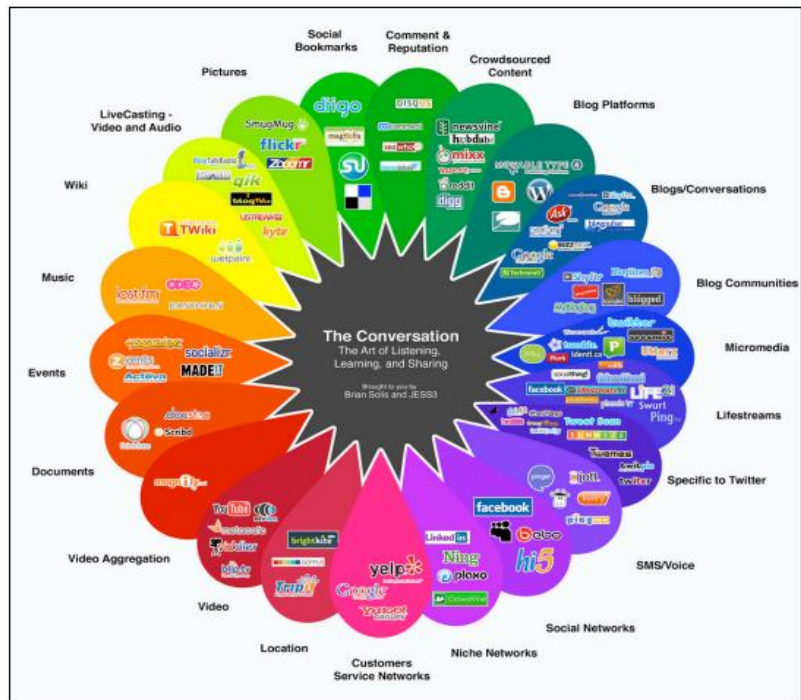


Figure 1. The Conversation Prism

Falls (2008) explains the social media as a medium for relationship building, interaction and community. The idea of provision of 'serious student-centered learning' geared by Goodyear and Ellis (2008) is supported by the arguments of many educators who prefer social media tools for learning purposes.

While referring to the vastness of social media, the social networking is one of its recognized features, which refers the learning activities of individuals by sharing interests, information, ideas and knowledge in communities of similar ideas, interests, or interact with the people having alike interests and ideas. Universities now use the social networking sites as alternative spaces wherein online interaction with faculty and peers has been adapted to university lifestyle by the students (Yu et al., 2010). Far-reaching interactive and collaborative functions of social networks has renovated the higher education as user-driven learning. It sets aside the learners for active participation in self-regulated learning according to their learning styles and pattern as described by Lee & McLoughlin (2010).

It is dire need of time to teach our students the innovative features of interactivity, collaboration and sharing through modern digital and social technologies in their learning frameworks. The significance of interactive learning is emphasized in learning theories of modern age (Muirhead and Juwah, 2004). As according to Siemens (2005), the theory of Connectivism acknowledges that we get our required digital and networked learning with variety of knowledge mines through online interaction and by taking part in virtual communities of shared interests, collaborative tasks and social networks.

Social interactions perform a vital role for learners' involvement in virtual online communities which hold a firm basis for situated learning. Greenhow (2011) claims that social networking technologies enable situated learning because of their eminent potential and educational worth, as having innate scope to enhance learners' engagement and motivation in learning through knowledge conception and participation. Also Mason and Rennie (2008) narrate that structural style and bases of inter-group communications and 'shared community spaces' enthuse and excite young to contribute in learning with enhanced motivation. Zepke & Leach (2010) proposed that students' motivation and dispositions will positively influence their potential to get engaged in interactive learning which ascertains the vague boundaries between socialization and online learning.

Motivation possibly affects the students' performance (Gabriele, 2003). According to Keller (1999), for successful learning of students in

online environments, Motivation is an essential factor. While designing online learning environments, if motivational requirements of students are determined and given priority in design, the motivation and performance of students can be increased (Keller & Suzuki, 2004). According to Song and Keller (2001), in order to maintain students' learning motivation in online environments, paramount choice is to use motivational models. Keller's ARCS motivation model (1987a) one, that is used most commonly.

The Keller ARCS model focuses on problem-solving approach and is constructed to motivate, encourage and enhance and support motivation of students to learn. This ARCS model is comprised of four factors, which are i) attention (A), ii) relevance (R), iii) confidence (C), and iv) satisfaction (S). These four factors embody distinct sets of situations or conditions that are deemed essential for a fully motivated person.

Table 1

Keller's ARCS Model of Motivation

FACTORS	EXPLANATION	BASIC TECHNIQUES
Attention	Confine interest of learner, stimulating inquiry to learn	a) <i>Perceptual Arousal</i> : to capture the interest of learner b) <i>Inquiry Arousal</i> : to stimulate curiosity of inquiry c) <i>Variability</i> : to maintain ultimate attention of learner
Relevance	Meeting the goals and learning needs of learner which effect a positive outcome	a) <i>Goal Orientation</i> : to meet needs of learner b) <i>Motivate Matching</i> : to provide learners with suitable choices, influences, and responsibilities c) <i>Familiarity</i> : Trying instruction regarding learners' experiences
Confidence	Helping the learners for building the belief that they will succeed, and providing the learners control over their success	a) <i>Learning Requirements</i> : to build positive expectations for successful learning b) <i>Success Opportunities</i> : to enhance the beliefs of learners in their capabilities and competence c) <i>Personal Control</i> : to illustrate that learners' efforts and abilities lead to their success
Satisfaction	Reinforcing the accomplishments of learners with internal or external rewards	a) <i>Natural Consequences</i> : to provide the learners with meaningful opportunities for using their recently attained knowledge b) <i>Positive Consequences</i> : to provide reinforcement for the success of learners

ARCS model is when applied to the online environment, online public forums like blogs are used for students' interaction to take place. Three varied types of interaction are defined by Moore (1989, those are, i) content–learner interaction, ii) learner–teacher interaction, and iii) learner–learner interaction. In the online learning environment, these types of interactions are enabled by synchronous or asynchronous features. Research has depicted that learners generally take more interest in learning while they collaborating with other learners rather than working independently. In addition, collaborative forums (blogs etc.) can support effectual and useful discussion by motivating learners to develop articulate and organized descriptions as issues or ideas are discussed with peers and teachers. This is important because researches (theoretical and empirical) have demonstrated that learning of students is significantly influenced by teachers and peers interaction.

Today, a large number of online instructors use blogs to allow students to interact and collaborate online discuss ideas and share knowledge relating to subject taught. Blogs are emerging sources in social networking. A blog can be simply defined as "a collection of personal online journals that serve to capture thoughts and comments and post them to a public web site for others to read and respond". Blog entries don't require the permissions from editor or moderator because these posts are normally informal in nature. Blogs noticeably retain the learners actively involved and motivated through the features of videos, animations, hyperlinks, comments, chats, learning resources etc. Asynchronous communication is an imperative feature of blogs making them preferably absolute platform for interaction and collaboration. However, the students' interaction level may differ conditional to their motivation. Blogs support the four categories of ARCS model to enhance and retain the learning motivation level of e-learners. Online tasks and activities being designed by online instructors are vital for the successful application of ARCS model. Such designed activities and online tasks promote, support, and enhance learners' motivation to learn through collaboration and interaction.

Methodology

The study presented in this paper was comprised of one-group experimental design to compare the learning motivation of 120 participants before and after using online learning blog. The participants of the study (n=120) were recruited from the course "Computer Applications in Education", of post graduation classes from session

2013-2015. This course was being managed traditionally by Education Department of University of the Punjab. Sample was chosen on the basis of use of internet and familiarity with online learning environments, although participants never had an experience to take online classes.

An ARCS survey questionnaire of learning motivation was administered with participants of the study (n=120). The survey was aimed to measure the level of learning motivation of learners while learning in traditional environment and using internet as learning tool (mentioned as PRE-MOTIVATION in study). ARCS survey of learning motivation enclosed four factors of ARCS Model regarding learning, which were attention, relevance, confidence, and satisfaction. This Pre-survey assessed the general motivation level of students regarding learning in traditional learning environment and using internet as a learning tool.

The same sample (n=120) was then registered to an online learning blog having all the general features needed for effective learning. Participants under experimental conditions received instruction using blog for consecutive six weeks. The course consisted of instructional modules, and students were required to regularly participate in a variety of online classroom activities using blog. The learning activities involved discussions, reading and writing assignments, taking part in polls and comments, collaborative tasks, collecting relevant learning resources, e-assessment, etc. All the instructional and learning activities were carried out using the blog during this time period. The online instructor continuously observed the participants how they were appeared to be engaged or disengaged to learning by their login-logout time, their attendance, their active participation in different learning activities, their conduct in collaborative learning tasks, assignment submission etc.

After the learning period on blog ended (after six weeks), same ARCS questionnaire was administered as post-experimental survey to measure the learning motivation level of students after having learning experience using blog (mentioned as POST-MOTIVATION in study).

ARCS Survey Scale

The questionnaire used for ARCS survey was comprised of 42 items to investigate all four factors of ARCS model of motivation presented by Keller. Participants' responses to questionnaire were sampled in terms of the scale ranging from strong disagreement to strong agreement (1 to 5) to investigate the four factors of ARCS model categorically.

Convergent validity of ARCS Scale (Confirmatory Factor Analysis - CFA)

A measurement model of collected data was developed. In structural Equation Modeling (SEM), measurement model aims to establish a relationship between observed and latent variables by applying confirmatory factor analysis to validate measurement scale.

The results of confirmatory factor analysis (CFA) showed that factor loadings of observed variables were sorted in a range from 0.256 to 0.853. As recommended by Hair et. al (2006), "the loadings of latent to observed variables should be above 0.50". Modification indices were used to guide deletion, and number of factors left over for each construct (each category of ARCS) were as follows:

- i) Attention : 19 items were initially written in ARCS survey scale keeping in mind two ways of gaining attention given by Keller, which are, i) Perceptual arousal and ii) inquiry arousal. As directed by CFA results, after deleting the items with regression estimates < 0.50, out of 19 items, 14 items were remained for exploring attention factor of ARCS model of Learning motivation. These 14 items were selected because of their factor loadings greater than 0.50. keeping in mind two ways of gaining attention given by Keller, which are, i) Perceptual arousal and ii) inquiry arousal.
- ii) Relevance: 16 items were initially written focusing the Kellers' strategies to establish relevance in order to increase learners' motivation to learn. Learners' experience, worth, usefulness and need matching were the sub-factors included in relevance factor. As result of CFA, after deleting items with factor loadings < 0.50, 9 items were remained in the ARCS survey scale to explore the relevance factor of ARCS model of learning motivation.
- iii) Confidence: initially 15 items in ARCS survey questionnaire were written which were intended to explore confidence factor of ARCS model of learning motivation, keeping in view the ways to increase confidence provided by Keller including understanding, objectiveness, meaningful success, feedback, learner control etc. were explored through these items of confidence factor of ARCS model. As CFA directed to delete all the items with regression estimates < 0.50, 7 items out of total 15 items were deleted because of lower factor loadings. 8 items were remained in the scale having

regression estimates > 0.50 for investigating confidence factor of ARCS model of learning motivation.

- iv) Satisfaction: 11 items out of 16 items were chosen on the basis of regression estimates > 0.5 which were written to explore the satisfaction factor of Keller's ARCS model of learning motivation. These items were purposefully designed focusing the Keller's strategies to increase learners' motivation by increasing the satisfaction level of learners. Items with regression estimates < 0.50 were deleted from the scale.

Reliability of ARCS Survey Scale

Reliability of survey tool was calculated with Cronbach's Alpha. The numerical value of reliability estimated was $\alpha=0.822$, which holds good internal consistency according to BrckaLorenz (2013).

Table 2

Reliability co-efficient of ARCS-survey questionnaire

Cronbach's Alpha	N of Items
.822	42

Measurement Models of data using SEM

Following measurement models were developed using Structural Equation Modeling (SEM) which showed the relationship between observed and latent variables.

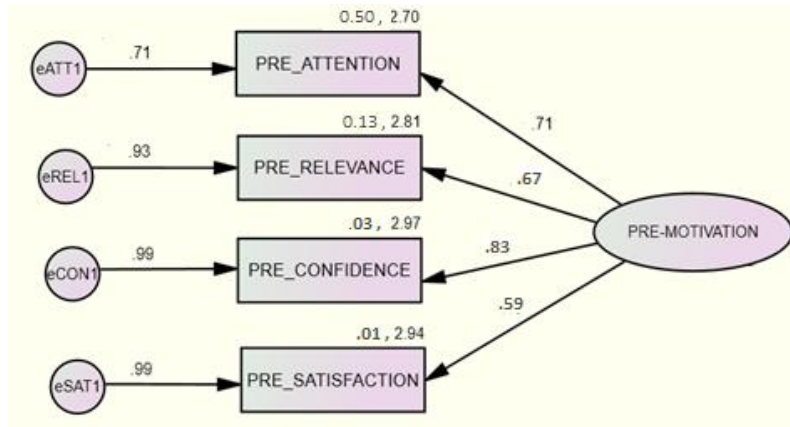


Fig 2. Path diagram for Pre-Motivation (before using blogs)

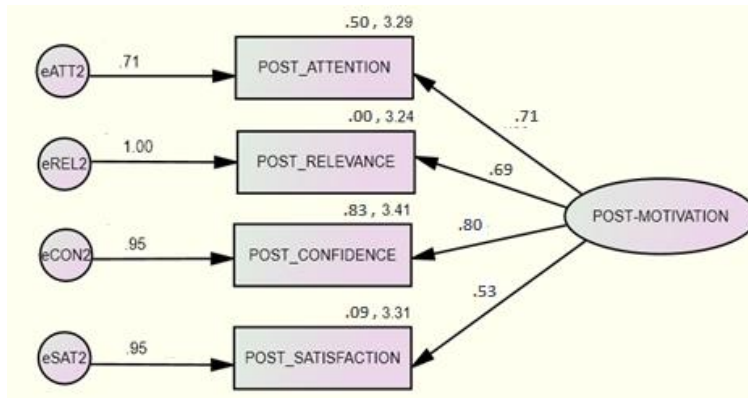


Fig 3. Path diagram for Post-Motivation (after using blogs)

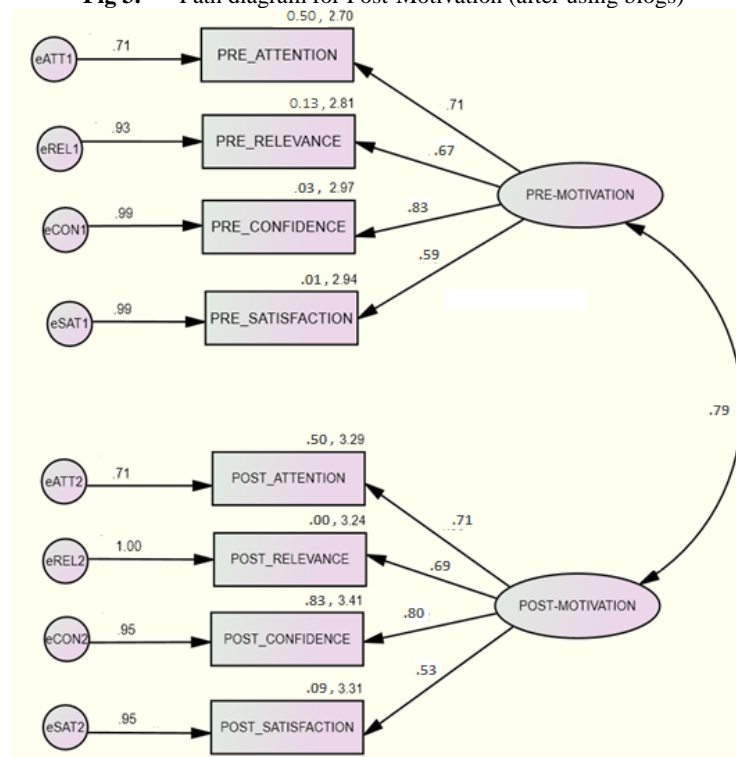


Fig 4. A measurement model of pre-motivation and Post-motivation

Data Analysis

Following the collection of responses of 120 students, data was analyzed using paired-sample t-test which is a valid test for comparing the results of same group before and after experiment. variables were compacted in the form of four pairs and paired-sample t-test was applied on the four pairs of data according to the framework of four themes (attention, relevance, confidence, satisfaction) determined by literature of review. Motivation level was calculated by adding mean values of all four factors (attention, relevance, confidence, satisfaction), before experiment (as Pre-Motivation) and after experiment (as Post-Motivation). Paired sample t-test was again applied for the comparison of the respondents' learning motivation levels before and after having experiment on the blog (table no. 5,6,7). The results were shown as:

Table 3

Statistics of Paired Samples

		Mean	N	Std. Deviation	Std. Error Mean
Pair-1	PRE_ATTENTION	3.6987	119	.30006	.02751
	POST_ATTENTION	4.2869	119	.28435	.02607
Pair-2	PRE_RELEVANCE	3.8077	119	.33667	.03086
	POST_RELEVANCE	4.2409	119	.52202	.04785
Pair-3	PRE_CONFIDENCE	3.9695	119	.44118	.04044
	POST_CONFIDENCE	4.4055	119	.39594	.03630
Pair-4	PRE_SATISFACTION	3.9366	119	.38141	.03496
	POST_SATISFACTION	4.3132	119	.38382	.03518

Table 4

Correlations of Paired Samples

		N	Correlation	Sig.
Pair-1	PRE_ATTENTION & POST_ATTENTION	119	.565	.000
Pair-2	PRE_RELEVANCE & POST_RELEVANCE	119	.724	.003
Pair-3	PRE_CONFIDENCE & POST_CONFIDENCE	119	.691	.000
Pair-4	PRE_SATISFACTION & POST_SATISFACTION	119	.796	.000

Table 5

Paired Samples t-test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	PRE_ATTENTION - POST_ATTENTION	-.58824	.27298	.02502	-.63779	-.53868	-23.507	118	.000
Pair 2	PRE_RELEVANCE - POST_RELEVANCE	-.43324	.53822	.04934	-.53094	-.33554	-8.781	118	.000
Pair 3	PRE_CONFIDENCE - POST_CONFIDENCE	-.43592	.33147	.03039	-.49610	-.37575	-14.347	118	.000
Pair 4	PRE_SATISFACTION - POST_SATISFACTION	-.37662	.29831	.02735	-.43078	-.32247	-13.773	118	.000

Findings and Conclusions

Table-3 showed descriptive statistics of two variables of each pair of four factors of ARCS model, i.e. attention, relevance, confidence, & satisfaction. The table contained Mean values, standard deviation, and standard error of mean for both variables of each pair. Table showed a significant difference between the mean values of both variables of all four factors (attention, relevance, confidence, satisfaction) which illustrated that mean values of all four factors of ARCS model were significantly increased after using blogs for learning.

In table 4, it was evident that there was a positive correlation between two variables of each pair of all four factors (attention, relevance, confidence, satisfaction) at significance level 0.05

- i) The correlation coefficient between two variables of pair-1 (pre-attention & post-attention) was $r=0.565$ at $p=.000$ which is < 0.05 . It depicted that there was significantly positive correlation between pre-attention & post-attention.
- ii) The correlation coefficient between two variables of pair-2 (pre-relevance & post-relevance) was $r=0.724$ at $p=.003$ which is < 0.05 . It depicted that there was significantly positive correlation between pre-relevance & post-relevance.
- iii) The correlation coefficient between two variables of pair-3 (pre-confidence & post-confidence) was $r=0.691$ at $p=.000$ which is < 0.05 . It depicted that there was significantly positive correlation between pre-confidence & post-confidence.
- iv) The correlation coefficient between two variables of pair-4 (pre-satisfaction & post-satisfaction) was $r=0.796$ at $p=.000$ which is < 0.05 . It depicted that there was significantly positive correlation between pre-attention & post-attention.

Table-5 was comprised of results of paired sample t-test of two variables of each pair of four factors of ARCS model.

- i) For pair-1, negative mean value -5.882 illustrated that attention was increased after treatment of experiment. There was strong evidence, $t(118) = -23.507$ and $p=0.000$ that Blogs significantly increased the attention level of students regarding their learning since $p<0.05$ at 95% confidence interval. According to literature on Keller's ARCS motivational model, an increase in attention leads to an increase in learning motivation level of learners.
- ii) For pair-2, a negative mean value showed that relevance was increased after learning through blog during experiment of study.

There was strong evidence, $t(118)=-8.781$ and $p=0.000$, that learning through blog significantly increased the relevance of learning for students since $p<0.05$ at 95% confidence interval. According to literature on Keller's ARCS motivational model, an increase in relevance leads to an increase in learning motivation level of learners.

- iii) For pair-3, a negative mean value showed that confidence level of students was increased after learning through blog during experiment of study. There was strong evidence, $t(118)= -14.347$ and $p=0.000$, that learning through blog significantly increased the confidence level of students to learn through online blogs, since $p<0.05$ at 95% confidence interval. According to literature on Keller's ARCS motivational model, an increase in confidence level leads to an increase in learning motivation level of learners.
- iv) For pair-4, a negative mean value showed that satisfaction level of students was increased after having a learning experience through online blog. There was strong evidence, $t(118)= -13.773$ and $p=0.000$, that learning through blog significantly increased the satisfaction level of students to learn through online blogs, since $p<0.05$ at 95% confidence interval. According to literature on Keller's ARCS motivational model, an increase in satisfaction level leads to an increase in learning motivation level of learners.

Discussion

Generally speaking, the motivation level of higher education students was significantly increased when they were put in an experiment to learn using online blogs as compared to the use of internet as learning tool in traditional classroom environment. The flexible features of blog accelerated the motivation level of students by enhancing all four factors of Keller's ARCS Model of motivation, which are Attention, Relevance, Confidence, Satisfaction. findings of the study showed that as the levels of attention, relevance, confidence and satisfaction were augmented, the students were more motivated towards learning in online environments using blogs, as discussed by Zoey (2009), "An e-learning platform provides rich learning resources in order to encourage and motivate them for proactive learning". The major implication of this study is that the management of higher education institutions and university teachers can provide support to motivate their students towards learning by using online environments such as blogs, which are effective learning tools to motivate the students to learn with more interest, satisfaction and confidence. Study also implies that students of higher education want

more novel learning experience with online technology rather using internet only as a learning tool. it is dire need of time that higher education institutions of Pakistan may blend online technologies with their traditional learning environments so that students may get more meaningful learning experiences through augmented motivation and engagement towards learning.

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