21ˢᵗ Century Educational Sector: A Case Study

Rinu Vasanth C.R, *Final MBA, Karunya University Business School* Karunya Nagar, Coimbatore, Tamil Nadu

Abstract: *The present study entitled '21st Century Educational Sector: A Case Study' is intended to examine the role that played by the Internet Facilities on student's performance through an E-learning as a medium in an Academic Institution. It was examined that how the E-learning (Blended) Learning encompasses a variety of tools to create flexible, rich learning environments that stimulate learners and maximizes the potential for learning. The other objective is Application of House of Quality in this study is to improve the medium of learning i.e. Internet Connectivity through a set of procedures in an effective way.*

Keywords: *E-learning, Internet Facility, Student's Performance, House of Quality.*

Introduction

"Blended learning is a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace and at least in part at a supervised brick-and-mortar location away from home."(Staker and Horn, 2012). E-learnind (blended learning) is just one piece of expanding technology landscape, but it has attracted particular attention for its potential to blend existing pedagogy and practice with new innovations in teaching and learning. India ranks fifteenth position in the world for service outputs and employs around 23% of workforce of the country. Since with the invention in the field of defense or space it is sure that India is developing at a high pace and education plays a vital part in this.

It is one to actually discover and measure the customer's needs and wants but to achieve desired outcomes these findings need to be translated into company language. Therefore, company should focus on what is wrong with the existing product or services and try to understand what the customer really wants. (Bouchereau, 2000). It can be said that, in an Educational Sector students are the products and the customers are companies that will recruit these students. Since, Internet is a facilitator of Blended Learning and the student's performance has a positive relation with internet. Application of House of Quality (HOQ) in this study is to improve the medium of learning i.e. internet connectivity through a set of procedures in an effective way.

House of Quality (HOQ) is one of the matrices of an iterative process called Quality Function Deployment (QFD). The foundation of the HOQ is the belief that products should be designed to reflect customers' desires and taste. HOQ is performed by a multidisciplinary team representing marketing, design engineering, manufacturing engineering, and any other functions considered critical by the company. In general, it provides a framework in which all participants can communicate their thoughts about a product.

Objectives and procedure of the study

Keeping the aforesaid two objectives in mind, data was collected

from a sample of 119 students residing in various hostel blocks (both men and women) using stratified random sampling technique. The questionnaire is applied to both the students who are using observed (university internet facilities) and other competitor's internet facilities, so as to figure out, through customer's competitive evaluation, the rate of importance of customer's complaints. Questionnaire was developed after an extensive literature review to measure the impact of Internet Connectivity in Blended Learning of the students.

The statistical analysis used was correlation, reliability statistics. The data was entered into SPSS version 20. The study on Reliability test shows that questionnaire developed was valid. The study also revealed that there is highly positive correlation between Internet Connectivity and student's performance. The House of Quality is the structured and systematic approach to make sure that the voice of the customer is listened during the design of the process, product or services. This study reviews that the main root cause of defect in internet connectivity is caused by physical interference (between that network itself and other networks) and the problem can be solved by blocking Rogue Access Points by sending traffic.

The study will highlight the importance of internet resource for ensuring effective blended learning (e-learning) in an educational organization, since the e-learning comprises mainly of learning through internet (i.e) E-Learning. Since the internet resource plays a vital role in such type of learning, the connectivity should be an effective thing and so the tool of quality function deployment i.e is house of quality is applied to reduce the defects and flaws in the internet connectivity (mainly internet speed) and make e-learning a successful one, so that student's performance can be increased in the organizations. The main tool which is applied, House of Quality.

Analysis of the study

Reliability

The reliability co-efficient for the variables chosen for the study should be more than 0.50 to consider it as an acceptable value. In this study the reliability analysis shows that the alpha value is greater than 0.50 indicating the evidence of reliability of the instrument is 0.606. The factors & dimensions included for analysis carry a good degree of reliability to support the objective formulated. Hence it is concluded that the data collected in this study is highly reliable.

Significance of the study

Correlation:

		University Internet Speed	Student's Performance
University Internet Speed	**Pearson Correlation**	1	-.159
	Sig. (2-tailed)		.085
	N	119	119
Student's Performance	**Pearson Correlation**	-.159	1
	Sig. (2-tailed)	.085	
	N	119	119

Table 1.2: *Correlation*

Interpretation: The table 1.2 shows the relationship between satisfaction of university Internet Speed and Student Performance in Academics. This has a highly positive correlation and the value is 0.085. This shows that if there is any change in satisfaction of university internet speed it may impact in student performance in academics.

FACTOR ANALYSIS:

KMO and Bartlett's Test[a]

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.579
Bartlett's Test of Sphericity	Approx. Chi-Square	665.736
	df	351
	Sig.	0.000

Table 1.3: *KMO and Barlett's Test*

Interpretation:

The KMO measures the sampling adequacy which should be greater than 0.5. For a satisfactory factor analysis to proceed. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is an index for comparing the magnitudes with the partial correlation coefficients. Large values of KMO measure indicate that a factor analysis variable is a good idea. The sample is worth enough to measure variables. Hence the above test shows the uniqueness and homogeneous

Rotated component matrix:

Interpretation:

The factors Internet connection, service provided, expectations for e-learning are the identified factors for e-learnind in educational sector. They have the factor value greater than 0.5.

REGRESSION:

Table 1.5: *Regression*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.510[a]	0.260	0.214	0.954

a. Predictors: (Constant),Internet role skill development, University blocks Educational site, satisfaction e-learning, satisfaction Internal Assessment, Academic Performance, helps assignment, Internet role educational communication.

Interpretation:

From the above table 1.5, the R Square value is 0.260 and adjusted R-Square value is 0.214 and this enlighten that the Model account for 26% of variance in the influence of e-learnind in educational sectors study . This is the clear indication that this Model is a good Model.

Table 1.6: *ANOVA*

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.610	7	5.087	5.586	.000ᵇ
	Residual	101.096	111	.911		
	Total	136.706	118			

b. Predictors: (Constant):Internet skill development, University blocks Educational site, satisfaction e-learning, satisfaction Internal Assessment, Academic Performance, helps assignment, Internet educational communication.

Interpretation:

From the above ANOVA table 1.6, it is inferred that the F-Value is 5.586 and the significance is 0.000. As the significance is less than 0.05. It clearly reveals that the model taken for the study is statistically significant.

Coefficients:

Table 1.7: *Coefficients*

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.830	.650		1.276	.204
	University blocks Educational site	.081	.068	.100	1.189	.237
	satisfaction e-learning	.060	.075	.069	.804	.423
	helps Assignment	.372	.091	.357	4.107	.000
	Academic Performance	-.092	.083	-.097	-1.115	.267
	Internet role educational communication	.125	.091	.122	1.376	.172
	satisfaction Internal Assessment	-.033	.079	-.036	-.418	.677
	Internet role skill development	.235	.074	.272	3.169	.002

a.   Dependent Variable: Happy to use Educational Sites

Interpretation:

The standardized beta coefficient table gives a measure of contribution of each variable to the model. T-Value of university blocks educational site is 1.189 and the significance is .237 and the probability is greater than 0.05. Thus the University blocks Educational site is not influencing in the prediction of overall e-learning in educational sector. T-Value of satisfaction e-learning is 0.804 and the significance is 0.423 and the probability is greater than 0.05. Thus the satisfaction e-learning is not influencing in the prediction of overall blended learning in educational sector. T-Value of helps assignment is 4.107 and the significance is 0.000 and the probability is greater than 0.05. Thus the helps assignment is

A Case Study has been taken from a well reputed University which is located in south India. Through this study it is proven that Internet has a positive relationship with student's performance. This case study depicts the fact of internet in their performance. In order to enhance the students' performance the quality of Internet is increased by adopting Six Sigma approach. Quality Function Deployment (House of Quality) Methodology which is discussed earlier is carried out in this case study. For this Questionnaire has been collected from 119 samples from students (customer) in a random sampling manner.

The primary tool for QFD is the house of quality. It is also known as matrix diagram or product planning matrix. This tool is used in this case study. The 7 major blocks of house of quality are:

1. The Voice of the customer- WHATs?

influencing in the prediction of overall e-learning in educational sector. T-Value of academic performance is -1.115 and the significance is 0.267 and the probability is greater than 0.05. Thus the academic performance is not influencing in the prediction of overall blended learning in educational sector. T-Value of internet role educational communication is 1.376 and the significance is 0.172 and the probability is greater than 0.05. Thus the Internet role educational communication is not influencing in the prediction of overall blended learning in educational sector. T-Value of internet role skill development is 3.169 and the significance is 0.002 and the probability is greater than 0.05. Thus the Internet role skill development is influencing in the prediction of overall e-learning in educational sector.

In this case study we are using Affinity Diagram, which is one of the 7 tools of quality. The lists of customer requirements (VOC) are to be entered on the left wall of the house. The primary requirements are generic in nature. Each one of the primary requirements will contain more (one or more) secondary requirements.

2. The Voice of the Organization- HOWs?

The QFD team has to identify ways, how these customer requirements will be met. Their main aim is to identify one or more technical requirements that will trigger in satisfying one or more customer requirements which is identified in Table 1.9. The HOWs are also quality characteristics or design requirements. HOWs are the list of what the organization can measure and control in order to ensure that it is able to satisfy

the customer requirement (Subburaj Ramasamy, 2012)

Table 1.9: *Affinity Diagram for technical requirements*

TECHNOLOGY	SERVICES	INFRASTRUCTURE
Increasing no.of routers	E-learning in curriculum	University Environment
Maintenance of equipment	Good Training	Transmitter Area
Block rogue access points	Employing network engineers	Less physical interference
Increasing no.of servers	Promptness of service	
Proper cable shielding	Professional skills	
More no.of coolers	Subject knowledge	
Antivirus	Resource knowledge	
Boost signal strength		
Close website not in use		

3. Inter-Relationship Matrix between WHATs and HOWs

The voice of the customer (VOC) is arranged in rows and the voice of the organization in columns. The relationship between customer requirements and technical requirements are found by using different symbols.

4. Technical Correlation Matrix – Interrelationship between HOWs

This matrix compares each of the technical requirements with every other technical requirements. Improving one requirement may lead to improvement or deterioration of another.

5. Customer Correlation Matrix – Interrelationship between WHATs

This matrix compares each of the customer requirements with every other customer requirements. Improving one requirement may lead to improvement or deterioration of another. The relationship between WHATs are shown in Figure 1.1.

Figure 1.1: *Relationship between WHATs*

Strong Positive (+ +),   Positive (+),   Strong Negative (- -),
Negative (-)

6. Planning Matrix – Prioritized Customer Requirements

In this case we measured the university internet performance against each requirements and also benchmarked with competitors' like Airtel, MTS. The performance is ranked on a scale of 1 to 10.

(a) *Importance to customer.* - Ordered the requirements from 1 to 10 depending upon the priority of the customers. The highest rating is 9 and lowest is 1. This column denotes importance of customer requirements of the product or service from the customer perspective.

(b) *Target Value:* -Assigning target values for the customer requirement based upon the fact like current performance, importance to customer and competitor's performance (1-10).

(c) *Scale up factor: - Ratio* of target value to the current performance rating of the service against each customer requirements.

(d) *Sales Point -:* Indicates how much meeting each customer requirements can be used for marketing for increased sales (1.00-2.00).

(e) *Absolute weight* :- Abs weight = Imp to customer* scale up factor * sales point

7. Prioritized Technical Requirements

In this case we measured the university internet performance against each technical requirements and also benchmarked with competitors' like Airtel, MTS. The performance is ranked on a scale of 1 to 10. This is a language of technical specifications.

(a) **Absolute Weight-:** Now, we have to look at the column corresponding to the importance to customer in the planning matrix (right side wall) and then multiply the corresponding degree of importance to customer with the degree of relationship index as shown infigure 1.10.

No. of Routers = 9*9 + 3*4 + 1*4 + 3*5 + 3*4 + 1*3 + 3*4 + 3*6 + 3*7 + 1*6 + 3*5 = 199

(b) **Relative Weight-:**In this step we have to multiply the marks for relationship index, with the corresponding absolute weight for particular customer requirement given in figure 1.9, which are reproduced in fig 1.11.

No. of Routers = 9*36+ 3*5.2+ 1*6.5 + 3*6.5 + 3*6.4 + 1*5.85 + 3*7 + 3*10.2 +3* 11.8 + 1*7.92+ 3*10.4 = 516.7

(c) **Target value-:** This is for the technical requirements. After considering all the factors, this value decides where the company wants to be. Technical requirement should be measurable parameters.

From the **House of Quality**, it is clear that the critical customer requirement (VOC) is Internet Speed and Less University Policies (absolute weight is 36 and 36.4 respectively) and the technical requirement from the company point of view is blocking the rogue access point and to boost the signal strength (absolute weight is 498 and 409

respectively). It clearly shows that company's performance is not up to the level of its competitors.

Benefits of Implementing Quality Function Deployment (House of Quality):

Since Quality Function Deployment requires high cost (for the employment of QFD teams, who are specialist in house of quality implementation) and time. So, the company focuses mainly on ROI. They expect high return on investment after implementing this methodology.

(i) Internet which is a facilitator of E-Learning has a positive correlation with the performance of the students.

(ii) University success is dependent upon the performance of the students.

(iii) Student's performance is guided by the efforts of Faculty.

(iv) Faculty is governed by the Administration.

(v) Administration is controlled by the Management of the University.

(vi) Management makes a key role for building University Reputation.

(vii) University Reputation attracts big companies for placement at high remuneration.

(viii) Placement will attract more no. of students to the University.

Conclusion

Now a days all the service or manufacturing sector are trying to implement Quality Function Deployment in their concern. By implementing quality function deployment, their customers will increase through this way it will increase their competitive advantage and profits. Internet is a facilitator of E-learning (E - Learning) and the student's performance has a positive relation with Internet. Application of Quality Function Deployment methodology in this study is to improve the medium of learning i.e. Internet Connectivity through a set of procedures in an effective way. The main root cause for the low internet connectivity is found out in this study. The solutions to minimize the causes are suggested.

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