Original Article

International Journal of Educational Research and Technology
ISSN 0976-4089
IJERT: Volume 3 [3] September 2012: 32 - 36

ISO 9001: 2008 Certified Organization
Website: www.soeagra.com/ijert/ijert.htm

A Study to Make a Clustering of Website Attributes on User Interface to Increase the Effectiveness of Indian Educational Websites

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ABSTRACT
The effectiveness of distance learning websites has an impact on higher education of the particular region. The socio-economic structure of the people of a particular area has an impact on the enrollment as well as continuation of the study in higher education. The user feedback of students about different barriers to get enrolled in higher education has been taken. In this paper an attempt has been made to map the real problems with facilities that can be provided by educational websites. The possible ways to overcome these problems by increasing the effectiveness of educational websites by clustering the attributes of them have been presented in this study. In this study problem centric clusters of website attributes to increase the effectiveness of websites are made.

INTRODUCTION

India is the second ranked country in the world with respect to population. In this context huge infrastructure is required to manifest education to all. There are several barriers (Panigrahi *et al*, 2011), in taking education and so that people cannot take education in the conventional educational system. So distance learning mode in higher education must be implemented effectively. Here approach to analyze the design and service elements of some internationally reputed websites, involved for distance learning is done. The customers are more likely to enjoy website which are full of information , entertainment and information are orderly organized (Eighmey 1997, Ghose and Dou, 1998). Zeithamal, Parasuraman and Malhotra in the year 2000 found 11 significant features representing characteristics of the website like access, ease of navigation , efficiency , flexibility , reliability , personalization ,security , responsiveness , etc.The present status of distance learning website in India is not up to the mark to fulfill the present requirement of the users and websites are not equipped with the up to date facilities. The major shortcomings in terms of providing facilities (eg: on line examinations, e-learning material etc) of educational websites in India are identified and necessary suggestions are given for incorporation of different facilities in a particular manner in those websites.

METHODOLOGY

Firstly the portions of the university websites which are mainly involved for distance learning are considered for this study. The universities are situated in India, Australia and America. A survey was conducted on the presence of attributes of websites. On the basis of presence of attributes a table of attributes is created. The attributes are collected on the basis of the belief that presence of attributes reflects the effectiveness. Presence of design and service related attributes can remove causes of poor enrollment ratio in higher education (Ghose and Dou, 1998). The attributes taken here are listed in table 1.

Here 23 attributes are taken . The survey has been made on three countries Australia, America , India.A survey on the people of a state is conducted and some reasons were identified which are having extreme impact in getting higher education[4] . These identified reasons are provided in the Table 2.

Table 1:

Attributes	Attribute Number
e-learning materials	***1***
online examination	*2*
online payment	3
computer-based training	4
web-based training	5
instructor-led training	6
online registration	7
online career counseling	8
web conferences	9
online helpdesk	10
study link to grow more	11
e forum	12
courses at per industry standard	13
Group email for learners	14
campuses in remote places to engage rural students	15
online competitions like e-debates	16
Online news to students regarding higher education	17
online career workshops	18
Intellectual Property Virtual Scholar Program	19
blended learning	20
mobile learning	21
Digital library	22
Digital Question paper access system	23

Table 2:

Serial number	Identified Reasons for low enrollment ratio in a state in India(West Bengal)
1.	Poverty
2.	Less number of higher education institutes
3.	No secured job after doing higher education
4.	Distance from residence to higher education institutes
5.	Bad transportation system
6.	Maintain family occupation and shortage of time
7.	Reluctance in Higher Education
8.	Less number of seats in higher education
9.	Improper guidance
10.	Less opportunities for all standards of students

Here in the table 2 ,the problems are marked from problem number 1 to 10 . For example poverty is problem1, distance is problem 4 etc. In this way the numbers are assigned to several problems. Now in table 4 a matching of attributes and problems are entered. The matching are entered on the basis of user feedback. Suppose first attribute e-learning materials can remove problems 1,6,7 . In this way we have made this table.

Table 3:

Attributes	Attribute Number	Issues can be resolved
e-learning materials	***1***	1,6,7
online examination	*2*	1,2,4,5
online payment	3	1,4,5,6
computer-based training	4	1,2,4,5,6,7,8,10
web-based training	5	1,2,4,5,6,7,8,9
instructor-led training	6	1,2,4,5,7,9
online registration	7	1,2,4,5,6,7,10
online career counseling	8	1,2,3,4,5,7,8,9,10
web conferences	9	1,2,4,5,6,7,8
online helpdesk	10	3,4,5,7,8,9,10
study link to grow more	11	2,3,4,5,6,7,8,9,10
e forum	12	1,2,4,5,6,9
courses at per industry standard	13	2,3,4,5,7,9,10
Group email for learners	14	1,4,5,9,10
campuses in remote places to	15	1,2,3,4,5,6,7,8,9,10
online competitions like e-debates	16	3,4,10
Online news to students regarding	17	1,3,4,5,7,9,10
online career workshops	18	1,3,4,5,7,9,10
Intellectual Property Virtual	19	1,2,4,5,6,7,8,10
blended learning	20	1,2,3,4,5,6,8,10
mobile learning	21	1,2,4,5,6,7,8,10
Digital library	22	1,2,4,5,8,9,10
Digital Question paper access	23	1,2,4,5,6,8,10

In the above table at first column contains attributes ,next column contains attribute numbers , in the next column the problem numbers that can be solved by the presence of the attribute in an educational website are written .These are written on the basis of user's feedback . In the next table (Table 4) a mapping of problems and attributes are written in binary format.

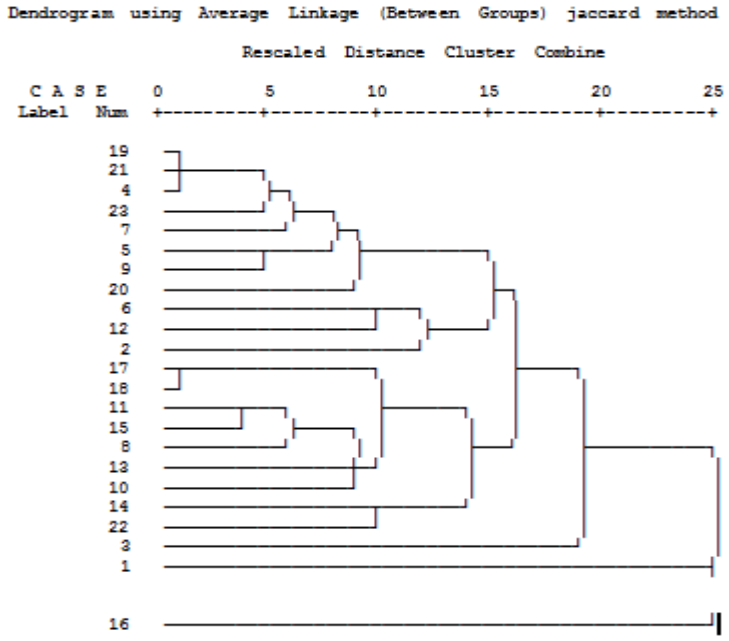
Table 4:

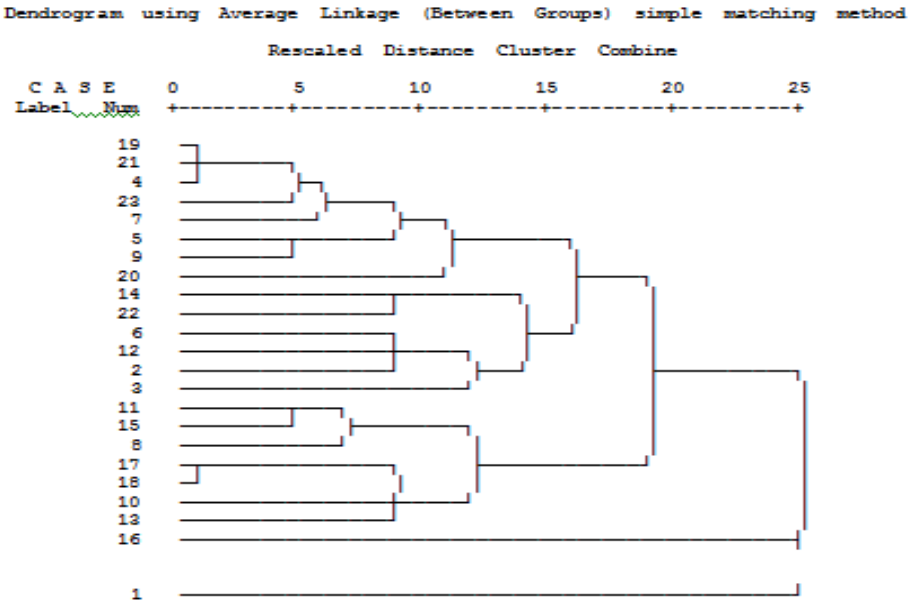
Attributes	Problem Number	1	2	3	4	5	6	7	8	9	10
1		**1**	0	0	0	0	1	1	0	0	0
2		1	1	0	1	1	0	0	0	0	0
3		1	0	0	1	1	1	0	0	0	0
4		1	1	0	1	1	1	1	1	0	1
5		1	1	0	1	1	1	1	1	1	0
6		1	1	0	1	1	0	1	0	1	0
7		1	1	0	1	1	1	1	0	0	1
8		1	1	1	1	1	0	1	1	1	1
9		1	1	0	1	1	1	1	1	0	0
10		0	0	1	1	1	0	1	1	1	1
11		0	1	1	1	1	1	1	1	1	1
12		1	1	0	1	1	1	0	0	1	0
13		0	1	1	1	1	0	1	0	1	1
14		1	0	0	1	1	0	0	0	1	1
15		1	1	1	1	1	1	1	1	1	1
16		0	0	1	1	0	0	0	0	0	1
17		1	0	1	1	1	0	1	0	1	1
18		1	0	1	1	1	0	1	0	1	1

19		1	1	0	1	1	1	1	1	0	1
20		1	1	1	1	1	1	0	1	0	1
21		1	1	0	1	1	1	1	1	0	1
22		1	1	0	1	1	0	0	1	1	1
23		1	1	0	1	1	1	0	1	0	1

After performing cluster analysis the results are given below. Here no assumptions were taken s on the number of groups or group structure. Groups are formed on the basis of similarities or dissimilarities of groups of data . Here total number of attributes are 23 , At first the similarities or dissimilarities are taken among 23 attributes .

HIERARCHICAL CLUSTER ANALYSIS





From the dendrogram it can be observed that, If the distance is taken less than five , the attributes 19, 21,4,23 are included in a particular cluster . And 17,18,11,15 are included in a particular cluster . If the distance is taken less than 10 then the cluster will be 19,21,4,23,7,5,9,20 in one cluster ,

6,12 in one cluster 17,18 11,15 , 8, 13, 10 are included in one cluster and 14,22 in another cluster . Then 3,1,16 are individually included and not forms any cluster.

CONCLUSIONS

It is mandatory to make an effective educational website .The website must be full of web attributes . This model says us that presence of attributes must be targeted to the socio economic conditions of the residents of a particular state for which we are building the website .It is preferable to use separate panel for placing of design and service related attributes related to a specific set of related problems.. Here website attributes 17, 18 11,15 are to some extent similar and provides similar services and targeted to the similar problems like poverty, No secured job after doing higher education, Distance from residence to higher education institutes, Reluctance in Higher Education, Improper guidance, Less opportunities for all standards of students .Similarly 19, 21,4,23 serves to remove a particular set of problems. So our first task is to take the user feedback of a particular region and then give special importance to a set of website attributes. This model can be followed by websites of any organization in any domain . If website is targeted to a particular region or class of people then developer of the websites have to understand the real problems of people and make an website using problem centric clustering method..

Most of the time people are suffering from some correlated problems. Because one problem may bring about the other problems. Suppose persons having poverty, cannot opt for higher education , they will opt for job in a very early age, if they will opt for job then shortage of time for continuing the education is also a problem. If unavailability of time is a problem, people cannot make communication with an educational institute situated at a distance from their residence. So distance of the educational institute also a problem. So a set of components of the website like on line study material, on line admission, on line examination, on line payment of fees, on line library ,can provide the facilities to the people ,so that they can get rid of the problems. As there is a high degree of correlation between the problems, person suffering from one problem, may also suffer from other correlated problems. So persons having a set of problems, if they can get the facilities from a cluster of components available at a particular area on web page, it will increase the navigational facilities of a website. So components having minimum distance can be clustered at a particular area.

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