

ELECTRONIC RESOURCES IN THE VIRTUAL LEARNING ENVIRONMENT AND EVALUATION OF MOODLE BASED LEARNING MANAGEMENT SYSTEM APPLIED AT PES INSTITUTE OF TECHNOLOGY, BANGALORE SOUTH CAMPUS: A CASE STUDY



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ABSTRACT

We learn things when we study but understood them when we do it practically. [1] With this view our education system understood this need slowly. Our dynamic teaching and learning in higher education has moved from traditional class room, face-to face learning environments to more interactive and collaborative environments due to a demand for online learning from students, and the desire from academic institutes to promote and deliver courses across the globe. With this regard e resources and Moodle based learning management system in the virtual learning environment in one of the best

solutions to get quality out of the education and to produce more information specialist and not merely faculty. This study evaluates in details the use of e resources and Moodle based learning management system in the virtual learning environment in PESIT Bangalore South Campus.

KEYWORDS : *Electronic Resources, Virtual Learning, Moodle, LMS,*

INTRODUCTION :

Advances in computer applications during the past few decades have brought radical changes in the way information is gathered, store, organized, accessed, retrieved and consumed. The application of computers in information processing has brought several products and services to the scene. The internet and the Web are constantly influencing the development of new modes of scholarly communication; their potential for delivering goods in quite vast, as they overcome successfully the geographical limitations associated with the print media. Further, the distribution time between product publication and its delivery has been drastically reduced. The internet can be used for efficient retrieval and meeting information needs. This is the very important fact which is convincing many libraries to move towards digital E-resources that are found to be less expensive and useful for easy access. This is especially helpful to distant learners who have limited time to access the libraries from outside by dial-up access to commonly available electric resources, mainly CD-ROM, OPACs and Internet, which are replacing the print media.

E-learning provides the opportunity for student to interact electronically with each other. This

interaction can be via e-mail or on discussion board or in chat rooms [2]. Though recognizing that the world at large will persist to use language and terminology in different ways, so the term of Virtual Learning Environments (VLE) is used to refer the on-line interactions for a variety of kind's activities that take place between students and teachers [3].

Therefore the purpose of this paper is to understand the usage of e resources and open source software in develop learning management system that concentrated to Moodle in the virtual learning environment.

LIBRARY PERSPECTIVE:

The growth in online learning or e-learning, in which education is delivered and supported through computer networks such as the Internet, has posed new challenges for library services. E-learners and traditional learners now have access to a universe of digital information through the information superhighway. New information and communications technologies, as well as new educational models, require librarians to re-evaluate the way they develop, manage and deliver resources and services. [4]

In this digital age, the first primary mission of the library service is to support the learning and teaching and research activity of its parent institution by providing access to information resources. Librarians can help to ensure that the service is directed at existing user needs and also be instrumental in developing and implementing new services that proactively address changing needs. This applies in the new electronic library environment just as it always has done in the traditional library. So it is considerable that Library is an integral component of any efficient education system. It plays an important role in the improvement of the organization. [5]

The PESIT BSC-Library was established in 2005 to meet the needs of its students, staff and researchers. It is housed in a two storied building located in the center of the campus with a carpet area of over 1000 sqmts. and is completely Wi-Fi enabled. Library is the nerve centre of all the activities in the campus and its well trained staff collectively supports teaching, research and extension programmes of the Institute. The Library is fully automated using "LIBSOFT" library management software and the collections include books, journals, project reports, CD's, DVD's and electronic databases on various branches of engineering, management, science and humanities and allied subjects. For the benefit of its users all e-resources such as IEEE-IEL Online, Springer CSE, E&E, and ME Collection, EBSCO – management collection, J-Gate – JET & JSMS collections and other e-resources are IP enabled so that any number of users can access, browse and download the subscribed e-resources from anywhere within the institution campus. All library resources are bar coded to make the circulation service efficient and fast and is Open Access. The library being a member of VTU-EDUSAT e-learning program airs lectures on various subjects conducted by VTU to its users in its exclusive VTU-EDUSAT room. The library also has English language lab and caters to the needs of the students to improve their communication skills. The library is completely Wi-Fi enabled with adequate number of computers to compliment and support the classroom teaching and requirements of its users.

The e-resources subscribed by the library such as IEEE-IEL Online, Springer CSE, E&E, and ME Collection, EBSCO Management Database, J-Gate (Engg. & Technology and Social & Mgmt. Science collections etc., are IP enabled and can be accessed from anywhere within the institution campus. Also many open access e-resources, lectures and videos of NPTEL can be accessed.

Library as a knowledge center aims to support the academic programs of the institution through comprehensive collection development based on the needs of its users through seamless access of learning resources to all the faculty, students and researchers to keep up to date with the

latest technological advancement in their field of specialization to meet the challenges in achieving excellence.

LIBRARY RESOURCES:

Library resource management has made significant moves towards subscribing to full text electronic journals and online reference material in support of the increasing number of students and resources are also available from the Library in both paper and electronic form offering users a degree of flexibility in accessing required learning material.

In addition to an extensive collection of shelf stock comprising various media, the Library includes an extensive range of online full text databases and retrieval services:

- 1 IEEE-IEL Online (includes over 200 journals, more than 1,400 conference proceedings & over 2,800 standards)
- 2 Springer Collection (includes 680 e-journals in CSE, TCE, ECE, Civil Engg., & Science streams)
- 3 EBSCO Management Collection (includes 660 e-journals)
- 4 J-Gate Engineering & Technology and Social and Management Sciences Collection (includes over 8,000 e-journals)
- 5 Sage Journals (5 Management Journals)
- 6 K-Nimbus Federated Search Engine – all the above listed e-journals can be accessed in a single search through this platform

METHODOLOGY:

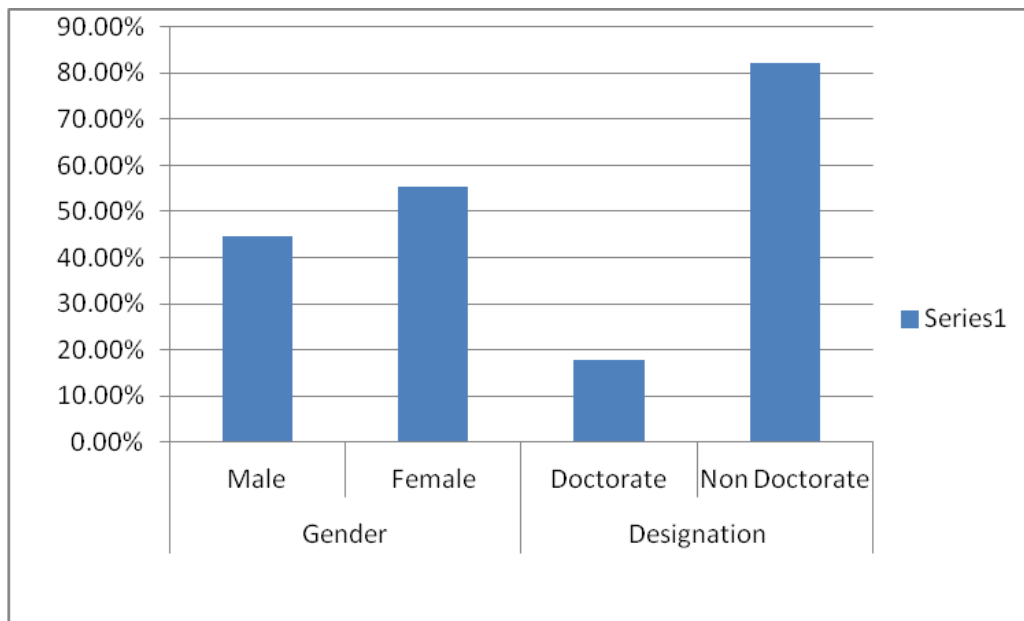
A study is based on survey (questionnaire) method. The structured questionnaire was designed to collect data from the PESIT Bangalore south campus. [6] The questions were objective pattern and questionnaire is divided into three groups. One group focuses on general information of respondents, another group deals with the use of electronic information sources and another group focuses on the beneficiary factors of learning management system specially Moodle and its efficiencies.[7] The questionnaire was distributed in total 70 faculty member of PES Institute of technology and response rate is 56(80%).

ANALYSIS:

Analysis of data was gathered through questionnaire which was designed to collect data from faculty of PES institute of Technology Bangalore south campus. The collected information is analyzed and presented in the form of graph and tables.

Table 1: Characteristics of respondents:

Characteristics of respondents		Counts
Gender	Male	25(44.64%)
	Female	31 (55.36%)
Designation	Doctorate	10 (17.86%)
	Non Doctorate	46 (82.14%)



The above graph displays the graphical representation of respondents belongs to various categories.

The Summarized data shows that out of 56 respondents, 44.64% are male respondents and 55.36% are female respondents. It's also shows that 17.86% are doctorate respondents and 82.14% are Non Doctorate respondents selected from the PES Institute of Technology.

Table 2: Department wise respondents

Department	Respondents Faculty	Percentage
CSE	18	32.14%
ISE	08	14.29%
EC	10	17.86%
ME	05	8.93%
MBA	02	3.57%
MCA	02	3.57%
Science and Humanities	11	19.64%

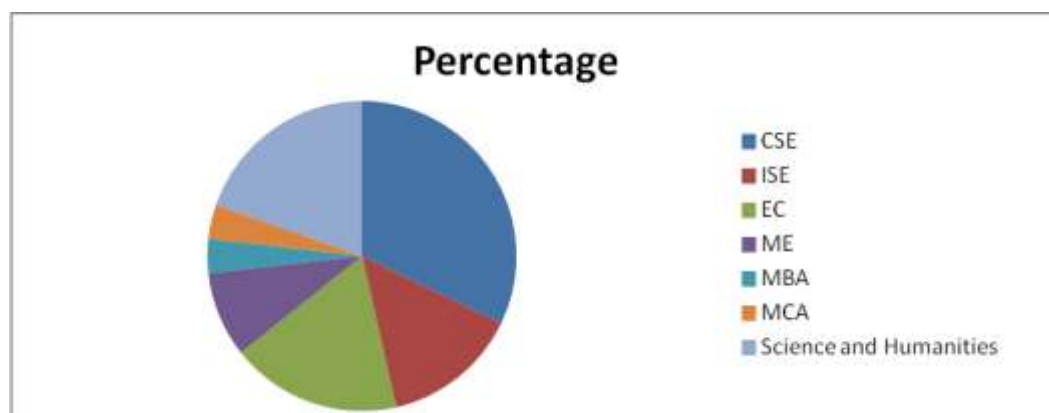


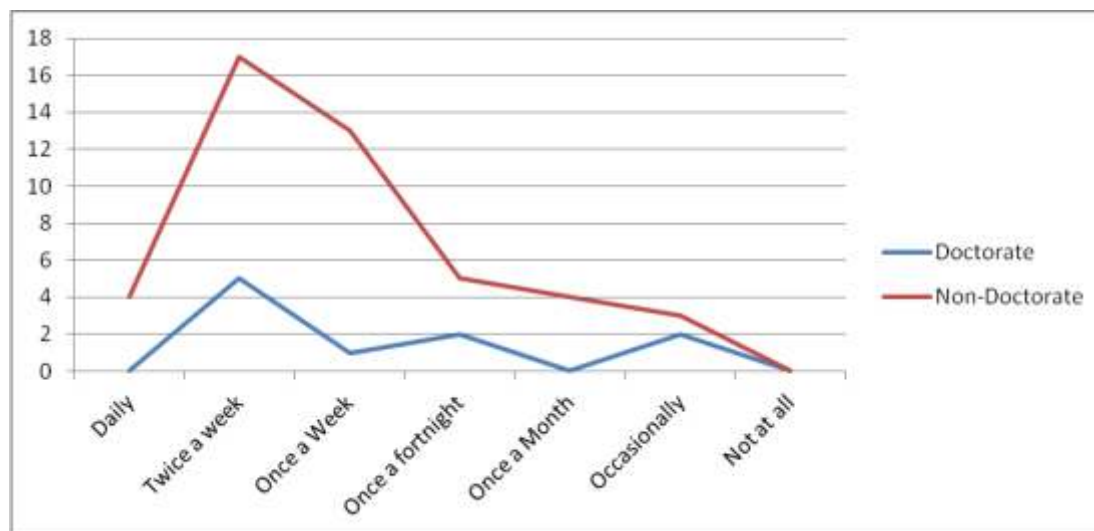
Table 2 has been represented in pie diagram above to have a better inside view. If we take a look at the table and graph we can observe that the highest number of respondents from CSE following by

Science and humanities.

Next table and graph are going to elaborate the library use on the basis of frequency.

1. Library Use:

Respondents	Daily	Twice a Week	Once a Week	Once a fortnight	Once a Month	Occasionally	Not at all
Doctorate	Nil	05	01	02	Nil	02	Nil
Non-Doctorate	04	17	13	05	04	03	Nil

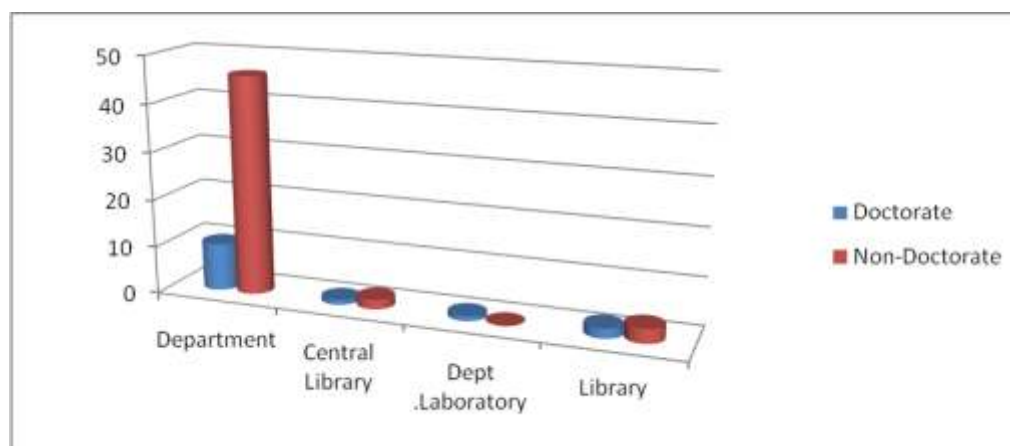


It is quite evident from the table and graph above that maximum respondents are using library twice in a week.

Use of Internet:

2. Internet access areas:

Respondents	Department	Central Library	Dept .Laboratory	Library
Doctorate	10	1	1	2
Non-Doctorate	46	2	0	3



Every respondents are availing the benefits of World Wide Web as internet has become reliable source of information and easily accessible. From the figures it is quite prominent that most respondents are accessing internet from their department.

3. Use of electronic resources for research

Respondents	Daily	2/3 Times a Week	Once a Month	Once a Semester	Never Use
Faculty Members	a.1 (1.79%)	a.7 (12.50%)	a.5 (8.93%)	a.1 (1.79%)	a.9 (16.07%)
	b.0	b.10 (17.86%)	b.10 (17.86%)	b.1 (1.79%)	b.7 (12.50%)
	c.9 (16.07%)	c.13 (23.21%)	c.7 (12.50%)	c.2 (3.57%)	c.1 (1.79%)
	d.48(85.71)	d.4 (7.14%)	d.0	d.0	d.0
	e.16(28.57)	e.27 (48.21%)	e.08 (14.29%)	e.1 (1.79%)	e.0

a.OPAC, b.CD/DVD ROM, c. Online Database. d. Internet, e. E Journals

If we look at the resources are being used for research in above table. Internet is occupying the highest number of chunk among all other resources on daily basis. Internet is taking a lead role in our research activities. The figure may vary based on the frequency of resources being used.

4. Comparison of information access by print resources and e resources:

Respondents	Most Easier	Slightly Easier	About the same	Slightly Difficult	Most Difficult
Faculty Members	a.46	a.7	a.0	a.1	a.0
	b.47	b.8	b.1	b.0	b.0
	c.35	c.12	c.4	c.3	c.0
	d.44	d.9	d.1	d.	d.0

- a. Information locating and identifying
- b. Accessing information
- c. Using information
- d. Sharing information

Accessing the print resources and e resources are easier within different categories thing whereas respondent have mentioned using the information is slightly difficult.

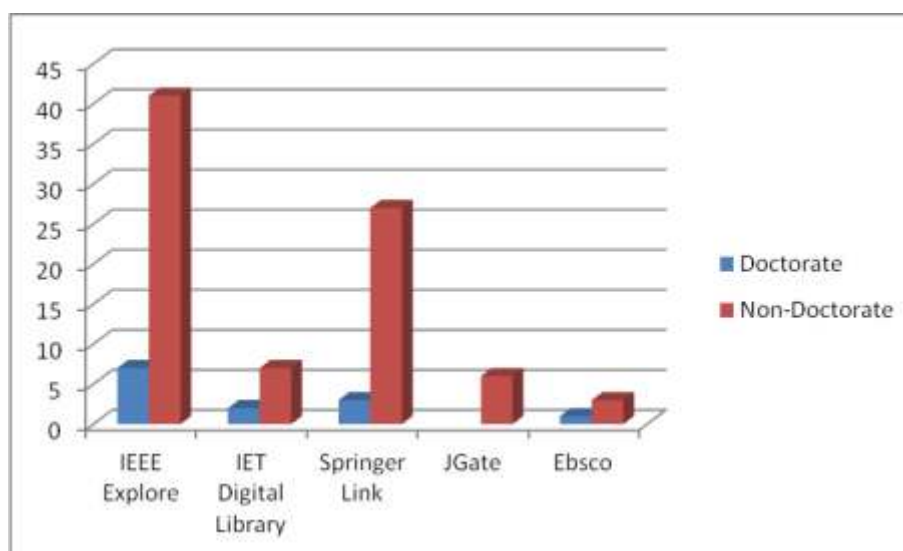
5. Frequency of use of full text database by Faculty Members:

Data base	Daily	Weekly	Fortnightly	Monthly	Occasionally
IEEE Explore	7	19	5	6	7
IET Digital library	1	5	3	3	8
Springer Link	6	13	7	8	9
J Gate	2		1	1	15
Ebsco		1	1	3	14
Any other (Please specify) ACM, Scopus And web of Science, Science Direct, IJAER, Elsevier	Elsevier-1 ACM-1	ACM-3 Web of Sc.-1 IJAER-1	Science Direct-2		ACM-1

The above table depicting a comparison view of different databases being used by faculty members on frequency basis. The IEEE Explorer and Springer Links are mostly visited full text database by faculty members.

6.Reference selection for research work:

Categories	IEEE Explore	IET Digital Library	Springer Link	JGate	Ebsco
Doctorate	7	2	3		1
Non-Doctorate	41	7	27	6	3



The above figure and table show the usage of various references based on two categories. Both the categories are using IEEE Explore and Springer Link in higher number in comparison to other resources for research work.

VIRTUAL LEARNING ENVIRONMENTS

In this recent technological era many organizations and educational institutions worldwide are attempting to integrate the educational systems of asynchronous e learning using virtual learning environments (VLE). The VLEs are software systems which are used for the purpose of e learning for group or personal learning. They are basically associated with Internet and provide much important functionality such as uploading, downloading and management of educational material, monitoring and evaluating of the students' learning progress etc. Virtual educational and/or an online training environment are provided by dedicated software tools, which are called Learning Management Systems (LMSs). The most popular LMSs are based on open-source code and support various facilities such as instructions to create courses, agendas, learning paths, discussions, assignments, self-assessment exercises and upload any kind of educational content. However Moodle, which is also an open source LMS, helps students to make their learning process easier by adapting individual needs and making a positive effect in overall learning structure. [8]

WINDOW OF MOODLE:

Moodle was first introduced by Martin Dougiamas at Curtin University in Western Australia [9]. Moodle is an open source course management system for online teaching and learning. The acronym

Moodle stands for “Modular Object Oriented Dynamic Learning Environment”.

Moodle is an open source tool which is accessible through web, supports various software packages to create, update and deliver online courses and other instructional communication tools. The benefit of modular structure is that programmers can add additional feature by applying scripts for different educational purpose.[10]

Moodle software has been build on the constructivist instructional principles and focused on best suited experiences that are most effective for teaching and assessing the information teacher think that students required to enhance their knowledge.

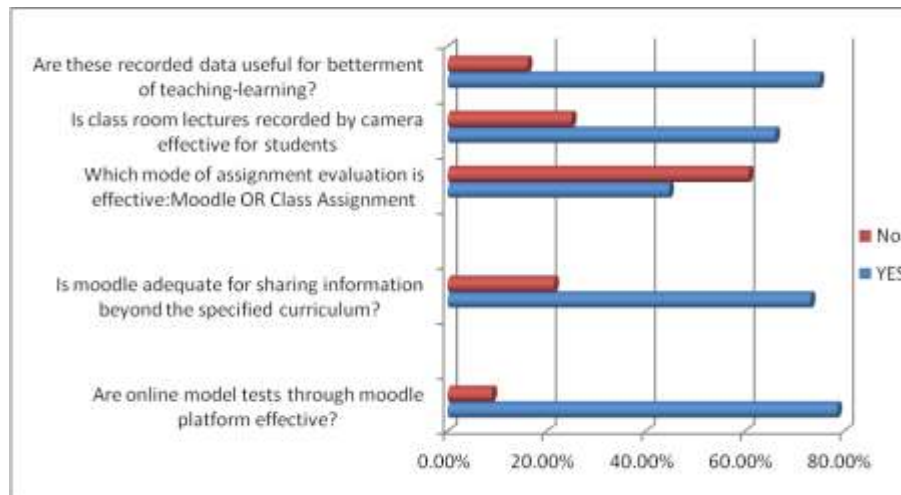
Also, they can help each participant in a course to be a teacher as well as the learner in a socially cooperative learning community [11].

Recently Moodle has become one of the most popular open source software applications in education. The socio constructivist approach to teaching and learning epistemologies within internet based communities of reflective inquiry also supported by Moodle. Moreover, it appeared in studies conducted by (SCORM, 2004) which indicate that as a course management system. It helps the teachers to improve classroom communication at their convenient by posting assignments, lesson plans, announcements and course documents. [12]

Beneficiary factors for Learning Management System of Moodle:

	Factors	YES	No
Faculty	Are online model tests through moodle platform effective?	44 (78.57%)	5(8.93%)
	Is Moodle adequate for sharing information beyond the specified curriculum?	41 (73.21%)	12(21.43%)
	Which mode of assignment evaluation is effective:	MOODLE-25 (44.64%)	Classroom Assignment 34 (60.71%)
	Is class room lectures recorded by camera effective for students	37 (66.07%)	14(25%)
	Are these recorded data useful for betterment of teaching-learning?	42(75%)	9(16.07%)

After analysis the respondent's data in the above table, we can say that Moodle has the capacity to change the current education structure and capable enough to drive towards new direction. Higher number of respondent has given their opinion in the favor of Moodle. Moodle has become very effective in various sections from online model tests to assignment evaluation.



Efficiency of Moodle:

Characteristics	Sub-Characteristics	Explanation	Yes	No
Functionality	Suitability	Can Software perform the task required	45 (80.36%)	2
	Accurateness	Is the result as expected	33(58.93%)	14
	Interoperability	Can the system interact with another system	27(48.21%)	12
	Security	Does the software prevent unauthorized access	42 (75%)	6
Reliability	Maturity	Have most of the faults in the software been eliminated over time	35 (62.50%)	11
	Fault tolerance	Is the software capable of handling errors	31 (55.36%)	9
	Recoverability	Can the software resume working and restore lost data after failure	28 (50%)	12
Usability	Understandability	Does the user comprehend how to use the system easily	37 (66.07%)	11
	Learn ability	Can the user learn to use the system easily	30 (53.57%)	7
	Operability	Can the user use the system without much effort	39 (69.64%)	7
	Attractiveness	Does the interface look good	34 (60.71)	10
Efficiency	Time behavior	How quickly does the system respond	33 (58.93%)	4
	Resource utilization	Does the system utilize resources efficiently	35 (62.50%)	8
Maintainability	Analyzability	Can fault can easily diagnosed	28 (50%)	12
	Changeability	Can the software be easily modified	30 (53.57%)	11
	Stability	Can the software continue functioning if changes are made	35 (62.50%)	6
Portability	Testability	Can the software be tested easily	26 (46.43%)	10
	Adaptability	Can the software be moved to other environment	23 (41.07%)	13
	Install ability	Can the software be installed easily	26 (46.43%)	8
	Conformance	Does the software comply with portability standards	24 (42.86%)	9
	Replace ability	Can the software easily replace other software	23 (41.07%)	10
All Characteristics	Compliance	Does the software comply with laws or regulations	30 (53.57%)	3

The above table shows the percentage data of different features related with Moodle according to the participants in survey. The survey result is quite encouraging for Moodle in different prospective. Maximum participants have given their nod in favor of Moodle.

CONCLUSION:

In summary, library services are an essential component of a quality online learning system. As access to Internet-based courses grows, an increasing number of e-learners are dispersed around the globe, often in parts of the world where physical access to the collections of large academic and research libraries is impossible. These learners are largely dependent on the quality and academic usefulness of services that the library can offer electronically. We have seen throughout the survey that e-resources are becoming popular among students and teachers. The new segment of e-resources Moodle, has been accepted by different sections of people related with educational system. Moodle is redefining the entire education system and paving a new way towards positive direction. [13] It is clearly outlined that PES Institute of Technology taken seriously in the development of e learning programs for the betterment of the student and these learning approach helps to create a shared understanding to concepts important to the learning culture and provide opportunities to reinforce them in a live classroom setting. We have ensure that our teaching staff who are building online courses to exploit library resources and embed these into the courses alongside internet resources.

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