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RESEARCH TRENDS IN THE AREA OF E-CONTENT DEVELOPMENT AND VALIDATION IN HIGHER EDUCATION

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Abstract

The review of the related literature acquaints a researcher with the current knowledge in the field in which he/she is interested to conduct research. It provides him/her the theoretical and empirical framework from which the problem has arisen. This paper presents a review of related studies conducted in the field of e-Learning Technologies. A detailed analysis of the related literature promotes a greater understanding of the problem at hand and design of the study. It also provides a theoretical base for the research and helps the investigator to conceptualize the problem and to choose the design of the study. The researcher reviewed the literature regarding development and validation of e-content. There exists a paradox in eLearning among various institutes. Few institutions join the race, while the rest suffer from lack of knowledge or from lack of realization of the importance of eLearning. Institutes like IITs, NITs, MIT are adopting all latest technologies and are keeping their students enlightened from various parts of the world. eLearning has vast potential in India. UGC, NAAC, ICSSR, DBT, NCERT, ICHR, NEEPA, AICTE and other agencies of ISO 9000 family are pushing from various directions to bring the slow growers to walk with the rest. Thus it was felt to conduct a study on "Development and Validation of e-content on *"Introduction to Extension & Communication"* for Universities and Students to contribute in the area of e-learning and higher education.

Keywords:

e-learning,

e-content,

Higher education.

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A journey of a thousand miles; said Confucius, begin when one puts one step forward. However this first step has to be in the right direction if one is to reach the desired goal. In the case of any research study, this right step is ensured by a thorough review of related literature. The review of related literature implies locating, studying and evaluating reports of relevant researches, study of published articles, going through related portion of the encyclopaedia and research abstracts, study of pertinent pages of comprehensive books on the subject and going through related manuscripts, is a very significant aspect of the research process. It allows current knowledge into the field or area in which one is going to conduct his research.

Review of related literature facilitates the researcher to have a clear understanding of research problem. Only when we review the area of related literature in its various perspectives, the research problem could be well understood. Besides, it would enable the investigator to select appropriate techniques, tools and procedure adopted in this research. The review of the related literature acquaints a researcher with the current knowledge in the field in which he/she is interested to conduct research. It provides him/her the theoretical and empirical framework from which the problem has arisen. The review eliminates the risk of duplication of what has been done. It is of no use to replicate a study when the stability and validity of its results have been clearly established. It convinces the researcher that the problem selected by him/her has roots in the existing literature and it needs further exploration. Through the survey of the related literature and its review, the researcher can identify the significant problems in the research area by avoiding unfruitful and useless problems. The findings of the significant problems are likely to add to the knowledge in a meaningful way. The careful and thorough review of related literature gives the researcher an understanding of the research methodology which is helpful in the selection of sample groups, selection and development of tools and techniques and application of date analysis techniques. The most important purpose for reviewing the related literature is to know about the recommendations of previous researchers highlighted in their studies for further research.

This paper presents a review of related studies conducted in the field of e-Learning Technologies. A detailed analysis of the related literature promotes a greater understanding of the problem at hand and design of the study. It also provides a theoretical base for the research

and helps the investigator to conceptualize the problem and to choose the design of the study. The researcher reviewed the literature regarding development and validation of e-content. To understand the problem, study and get insight into the area the researcher reviewed literature in two categories:

Section: I Factors affecting the e-learning, Perceptions and Readiness of students about e-learning

- Studies Conducted in India
- Studies Conducted in Abroad

Section:II Development and Validation of E-content/ E-learning packages

- Studies Conducted in India
- Studies Conducted in Abroad

Section: 1 Factors affecting the e-learning, Perceptions and Readiness of students about e-learning

Studies conducted in India

Rajasekaran and Arulchelvan,(2015) studied "**Effectiveness of Visuals in E-Learning on Media Communication Courses" in Tamilnadu .** The Objectives were to find out the effectiveness of visuals in media communication courses, to find significant role played with art and design. The sample of the study consisted of 415 student from bachelor degree courses (art, architecture and media) Anna University and other colleges offering same courses. Random sampling method was used for sampling. Research Design was Survey. The Tool used for Data collection was self-administered questionnaire.

The major findings of the study revealed that visuals in stories were adding interest and improved learning was the most important factor on awareness on e–learning content, followed by e-learning used for updating knowledge and user friendly. Learning created interest to explore the learning ,Like the idea of learning with 3D graphics and animation using in a computer than sitting in a classroom with a teacher and book, e-learning accessible at any time and any place and so on. The least factor was e-learning was expensive than other learning followed by Solve the problems in a better way compared to classroom assignments, Visual learning was better than the face to face class, Easy to remember the e-learning content and so on. Video gave overall input about the content along with audio was the most important factor on Effects of various Types of Visuals In e-learning Content Design of Students on Video, followed

by Feel of reality was high in video than the other forms of visuals . The least factor was stronger colours disturbed the learner to learn followed by Text + audio were highly supported by visuals for effective learning. The Impact of visuals among Students before showing the various types of visuals in media communication and design principles on e- learning content was 48.9 percentage. The Impact of visuals among Students after showing the various Types of visuals in media communication and design principles on e- learning content was 70.2 percentage. Visual based e-learning method made the students more understanding of the media, art and design subjects than traditional face-to-face teaching method. Visuals based e-learning could create easy understanding, focus on learning, retention level, and higher score in the examinations among the students were highly possible.

Sharma and Hardia (2013) carried out a researchon **"-Measuring Level of Usage of E-learning amongst Students Pursuing Higher Education.** The Objectives of the Studywere to identify the factors affecting the level of usage of e-learning amongst students of higher learning and to study the effect of demographics on the factors affecting the level of usage of e-learning amongst students of higher learning. Data was collected using a self-prepared questionnaire. The questionnaire was sent to 400 students pursing higher education in Indore and nearby city. A total of 341 questionnaires were found to be suitable for the analysis. In order to study first objective factor analysis was carried out. Factor analysis was conducted on the survey data using SPSS to establish the factor structure of level of usage of e-learning amongst students of higher learning. Factors were found to be significant were 1). Comfort level with technology, 2). Group Learning, 3) Disciplined Explorer. Based on the results above gender, qualification and educational background was not found to be significant in the level of usage of e learning for students of higher education. However age was found to be significantly affecting the level of usage of e-learning for students of higher education. Further was observed that work experience was not found to be significant for comfort level with technology and learning using technology but was found to be significant with group learning.

Sood and Singh (2014) studied**on "e-learning: Gender analysis in higher education in North India"**. The study was aimed to analyse the genders' interest in e-Learning in higher education in the northern part of India. A questionnaire survey designed for the purpose gathered

information on students' participation and opinions about the use of e-Learning in higher education. The survey was conducted on a group of 392 people involved in higher education in Chandigarh (northern part of India) and surrounding areas. The group was a heterogeneous one and consisted of students in the fields related to Information Technology at the college and university level. The students targeted were the ones who were enrolled in different streams (related only to the field of IT) at under graduate and post graduate levels for studying in various colleges as well as in the university affiliating these colleges. The analysis of the results clearly indicated that the e-learning patterns were not gender sensitive as far as the web-base learning style was concerned. Similarly, it was found that there was no significant gender sensitivity in the area of interests in software project management. But as far as the issues of 'knowledge about the typical patterns observed in software projects' was concerned, the various parameters have been found to be significantly gender sensitive.

Jaiswal (2013) conducted a study on "Current Status of e-Learning in Indian Higher Education: A Case Study of U.P". The study was conducted to find out the current status of e-learning in higher education. The objectives of the Study were to study current status of e-learning in Universities and their affiliated Aided colleges of U.P. (India) and to study teachers' and students' perception towards e-learning. Thus, in order to study this objective 2919 teachers (839 teachers from professional courses and 2080 teachers from non-professional courses) and 7717 students (4512 students from professional courses and 3205 from non-professional courses at UG & PG levels) were selected as a sample for the present study. Professional courses were consisted of BBA, BCA, B.Tech., B.Pharma, BFA, LLB, B.Ed., M.Ed., MBA, MCA, MFA, MSW, M.SC.(Biotech.), M.Sc.(Microbiology), and PGDCA whereas non-professional courses were comprised of B.A., B.Sc., B.Com., B.Sc.(Ag.), MA, M.Sc., M.Com, M.Sc.(Ag.) were selected as a sample from the eleven state universities of U.P. for the study. Self-developed tools on *e-learning* covering above objectives were used in the study to collect the data from teachers and students. It was found that below average number of professional courses' teachers in higher education were using e-learning mode whereas only a few non-professional courses' teachers were using e-learning mode. There were three modes of e-learning viz. online mode, hybrid/blended mode and e-enhancement mode but only e-enhancement mode was being used by the professional and non-professional courses' teachers in Indian higher education. The major

findings of the study were as follows: 1) Below average number of professional courses' teachers in higher education is using e-learning mode. Only a few non-professional courses' teachers are using e-learning mode. There are three modes of e-learning viz. online mode, hybrid/blended mode and enhancement mode but only *e-enhancement mode* is being used presently by the professional and non-professional courses' teachers in higher education. Teachers also admitted the benefits of integration of e-learning in their pedagogy. The study also found that majority of teachers is using e-learning from the last five years. Also the majority of students and teachers are completely satisfied with e-learning mode. 2) Currently being used features of e-learning are providing general information, study notes and interaction through e-mail, guiding student to web resources, and to some extent assignment handling and feedback; virtual class room facility. Further, the features of elearning which may be most useful according to teachers are providing general information, study material, links to web resources, online discussion, online tutor support, virtual classroom facility, VLE for assessment methods and e-LMS. 3) Majority of teachers are in favour of use of various aspects of e-learning in future viz. mlearning, podcasting and vodcasting, intelligent tutoring system, educational simulation and games and educational blogging. 4) According to teachers the most benefitted aspects of teaching-learning by introducing elearning are delivery of teaching-learning, development of the content, interaction, management and resources for teaching-learning whereas the least benefitted aspects were assessment and student support. Greatest benefits of introducing e-learning from student perspective are self-pacing, communication and feedback, deeper knowledge, helps in building specific skills, helps in targeting specific weaknesses of students, and increase in accessibility to content and tutor. 5) It was found that almost half of the teachers and only a few students have access to UGC Infonet e-journals in their library although their teachers admitted that near about average students have access to e-journals. Majority of the students and teachers are satisfied with the e-journals but some teachers and students also reported problems in accessing ejournals provided by UGC-Infonet such as low access speed. 6) Almost half of the students reported that utilization of traditional library has been decreased by 20 percent because of digital library. More than average number of students reported about 20 percent decrease in use of other modes of learning because of elearning. 7) The major motives for introducing e-learning for professional courses' teachers are meeting individual needs, encouragement of learner autonomy, development of life-long learning skills, self-pacing, enrichment of learning

resources, improving student's experiences. Similarly, major motives for non-professional courses' teachers were encouragement of learner autonomy, development of life-long learning skills, self-pacing and improving student's experiences.

Lakshmi (2012) carried out a research titled"A study on E-learning in Gujarat". The objectives were to study the e-learning forms in adopted in higher education institution in Gujarat to infrastructure facilities available in higher education institution in Gujarat and to study the opinions of students, faculties and lab administrators regarding e-learning practices being adopted in higher education institutions of Gujarat regarding concept of e-learning, use of e-learning tools and Future scope of e-learning. The Sample of the study consisted of 83 faculties, 153 students and 12 lab administrators using online learning fully or in blended mode from 22 Higher Education Intuitions. Research was carried out using Survey design. Tool Used for Data collection Questionnaire. Major Findings are Most of the faculties in higher education institutions had individual personal computers with internet connection, with higher bandwidth for them in their staff rooms. Only few institutions were using CMS/LMS for providing e-learning practices and When it came to blended form of e-learning approach, most of the institutions were using the basic e-learning practices lie intranet and e-mail while the practices like blogs, video conferencing, chats, virtual classrooms were adopted at a very minimal level in the institutions which were adopting the e-learning practices and Many higher educational institutions were making use of institutional website to adopt either blended approach of e-learning or fully online approach. Selected institutions were offering any self-paced courses in module formats in various areas of studies either through institutional websites or through their tele-learning centres. Some of the initiatives many institutions uploaded their courseware, recorded video sessions, interactive tele-conferencing sessions, online counselling sessions, sample question papers, question banks, online assignments, lab manuals on to their website. The most common available facilities of e-learning were online study material, online syllabus while assignment feedback, tests or quizzes, open forums, web seminars and digital libraries were the least available e-learning facilities. It was observed that most of the higher education institutions were using the e-learning practices since last three years and in very few institutions it was mandatory for the faculties to use e-learning practices in their teaching – learning, evaluation and other aspects. Both students and faculties felt that the e-learning

practices adopted by the institutions were at very basic level and hence they did not need any special guidance in this regard. Majority of stakeholders were satisfied with regard to the e-learning practices being adopted in the institutions. According to the respondents gender did not appear to moderate the response of students in e-learning mode and academically well prepared students respond more positively to e-learning practices of the institution than academically less prepared students. Regarding the benefits of e-learning, the stakeholders felt that access to information related to the course content becomes easy and fast in the e-learning platform and further it was easy to reach more students in less time. They all almost equally felt that e-learning platform provides the scope for learning at own pace, at any time. However, both faculties and students expressed that e-learning platform was not of that help in maintaining transparency in the system. On the part of the faculties, they felt that providing additional information regarding the course becomes easy in e-learning.

Nachimuthu (2010) conducted a study titled "Identifying the usability of e-learning resources in teacher education of India". The objective of the study was to identify the usability of e-learning resources in teacher education of India. The sample of the study consisted of 17 College of Education 115 B.Ed. Students in Salem District of Tamilnadu. Convenience sampling method was used as sampling pattern. The research designed used was Survey. Tool used for data collection was Questionnaire. Major Findings of the study were that all the institutions were having at least five computer peripherals with 70 per cent Air conditioned facilities in their ICT laboratories. Majority of B.Ed. college Trainees and their colloquies were already taking actions regarding some of the accepted ways of use of computers in their regular classrooms (32.0), however they were not prepared to sacrifice their personal comfort for using e-books (in total 45%), they have strong reasons for that. The College of Education trainees were using the physical books handling (86.2) rather than the e-books were also evidenced that, they were either not having enough time to use e-books or entry in the computer labs.

Studies conducted in Abroad

Rhema and Miliszewska (2014) conducted a study on "Analysis of Student attitudes towards E-learning: The Case of Engineering Students in Libya". The objectives were to analyse the relationships between student attitudes towards e-learning and their demographic

characteristics, access to technology, use of technology for learning, skill in technology, and satisfaction with technology. Sample was 348 undergraduate engineering students from the departments of Electrical Engineering and Petroleum Engineering from University of Tripoli & University of Al-Jabal Al-Gharbi. Research Design used was Survey. Tool used for Data collection was questionnaire. Major findings of the study revealed that all the participating students had positive attitudes towards ICT and e-learning; they felt confident in using computers, enjoyed using ICTs in their studies, believed in the benefits of e-learning, and would be interested in studying courses that used e-learning. Students believed strongly that e-learning would give them the opportunity to acquire new knowledge and enhance their learning experiences. Students reported moderate enjoyment of using ICT for studies. The results showed that female and male students had positive attitudes towards technology. Male students felt more confident in using computers and enjoyed using ICT for their studies more than the female students, whereas female students believed stronger that e-learning enhanced their learning experience. There were no significant differences in the levels of attitudes towards ICT and e-learning between younger and older students, or first year students and students in other years of study. There was no significant difference between female and male students, or between urban and regional students with respect to their attitudes towards ICT and e-learning.

Nedelko, Cirnu, Stănescu, and Potocan (2013) conducted study on **"The Impact Of Personal Values on Readiness to Use ICT in E-Learning Process"**. The main purpose of the study was to examine the impact of personal values on readiness to use information and communication technology.. Among possible factors influencing people's attitudes towards e-learning, the study focused on people's personal values that importantly determine their attitudes, preferences and consequently readiness for use of information and communication technology. A model was developed analyzing the impact of people's personal values on their preferences about information and communication technology. Using structural equation modelling approach, casual relations were examined on samples of Slovenian and Romanian undergraduate students, whereas students were involved at least in web-supported type of e-learning. The sample included responses from 155 Slovenian and 151 Romanian undergraduate students. Results revealed that personal values significantly influence on student's readiness on information and communication technology.

Chang Zhu*, Nadine Engels (2012) conducted a research on **"Organizational culture and instructional innovations in higher education: perceptions and reactions of teachers and students".** The objective of the study was to examine teachers' and students' perceptions of organizational culture of their universities and their views about and reactions to instructional innovations with regard to student-centered learning, collaborative learning and use of innovative educational technologies. The sample of the study consisted of 1051 students and teachers from Six Chinese universities. A survey research design was followed for study. The results showed that features of organizational culture affect students' and teachers' perceived need for innovation, their views about innovative approaches to instruction, responsiveness to instructional innovations and the perceived implementation level of educational innovations.

Humaidi, Syazwan Mohd, Asarani, and Annuar(2011) conducted a study on **"Students' Performance on the Implementation of Online Learning System".** The objectives were to examine the relationship of readiness and attitude factor on students' performance towards the implementation of online learning and identify the differences between genders in student readiness for online learning. Sample 331 students from e-PJJ programs in UiTM Shah Alam, Malaysia. Research Design was Survey. Tool Used for Data collection was Questionnaire. Major Findings are Readiness was the stronger influences on students' performance than attitude. Both factors had significant effects on students' performance but with moderate relationship based on the analysis result. The finding further revealed that there was no significant difference between male and female students. The finding means that female and male students had similar levels in readiness.

El Gamal & Abd EL Aziz (2011) "The Perception of Students Regarding E-Learning Implementation in Egyptian Universities" The objectives were to understand the perception of students regarding e-learning implementation in Egypt. The sample was 77 higher education student respondents from Alexandria and Cairo. Research Design was survey. Tool Used for Data collection was Questionnaire. Major Findings of the study revealed that higher education students in Egypt were aware of e-learning educational mode. There was no significant variation in students' preferences regarding the higher education learning mode. Students prefer on-campus education because they were more familiar with it. Students preferred e-learning because

it solves HE problems. E-learning would not face difficulties during its implementation. E-learning will improve HE problems in Egypt. Egyptian higher education Students in Egypt were infrequent Internet users. There was no significant variation between e learning graduates and on-campus graduates with regards to recruitment chances.

Lam, Lee, Chan & McNaught (2010) in their study on **"Students' use of eLearning strategies and their perceptions of eLearning usefulness"**. The objectives of the study were to study undergraduate students' perceptions towards the use of technology for teaching and learning and to study students' previous experience in using technology, in particular various eLearning strategies, affect their perceptions of the value of eLearning. The sample of the study consisted of 1438 students at The Chinese University of Hong Kong. Survey was conducted. The finding of the study revealed that t

students were generally positive (though not overly enthusiastic) about various forms of eLearning. Students who were more experienced in using technologies in their everyday lives were in general more positive about eLearning strategies. Most interestingly, the more experience the students had with eLearning strategies, the more positive they were towards eLearning as well. It was evidence that eLearning has provided learning benefits to the students.

Alebaikan (2010) in the study on **"Perceptions of Blended Learning in Saudi Universities"** studied to explore the perceptions of Saudi female lecturers and undergraduate students towards blended learning from their experience as participants in blended courses. The objective of the study was to identify Saudi female undergraduate students' and lecturers' perceptions of the advantages, challenges and future of blended learning. Consequently, the key factors that influence the lecturers‟ and students‟ views were discussed, and recommendations for future research, strategy and practice were provided. Qualitative methods were used to obtain rich descriptive data to facilitate the exploration of the phenomena. Based on interpretative philosophy, the data was analysed in the form of explanation and interpretation of the participants‟ perceptions of blended learning. The study concluded that blended learning had the potential to offer a successful learning experience in Saudi Arabia. As there were always challenges of adaptation when a new approach was employed, the research provided insight into how the challenges of implementing blended learning in Saudi Higher Education could be

addressed. A theoretical blended learning framework was introduced to provide the factors that influence the implementation of blended learning. One of the major conclusions was that a blended learning environment offered Saudi females the flexibility to continue their higher education while maintaining their own cultural values and traditions.

Hung, Chou, Chen, and Own(2010) conducted a research on **"Learners' Readiness for Online Learning: Scale Development and Student Perceptions".** Theobjectives of the study was to develop and validate a multidimensional instrument for college students' readiness for online learning. Sample of the study consisted of 1051 college students in five online courses in Taiwan. Tool used for data collection was Online Learning Readiness Scale (OLRS) was dimensions: self-directed learning, motivation for learning, computer/Internet self-efficacy, learner control, and online communication self-efficacy. Major Findings of the study revealed that Students' levels of readiness were high in computer/Internet self-efficacy, motivation for learning, and online communication self-efficacy and were low in learner control and self-directed learning. The study found that gender made no statistical differences in the five OLRS dimensions, but that higher grade (junior and senior) students exhibited significantly greater readiness in the dimensions of self-directed learning, online communication self-efficacy, motivation for learning, and learner control than did lower grade (freshman and sophomore) students.

Marti´Nez-Caro (2009) conducted a study on **"Factors Affecting Effectiveness in E-Learning: An Analysis in Production Management Courses"Murcia, Spain.** The objective was to evaluate the potential factors affecting the effectiveness of engineering e-learning courses by applying structural equation modelling in a sample of students of multiple production management courses for industrial engineering students. Sample of the study consisted of 425 students. Research Design used was Survey. Tool used for data collection was questionnaire, Physical & e-mail. Major Findings of the study revealed that student age and gender were not significantly related to perceived learning. Contrary to expectations, working student status was found negatively related to perceived learning with e-learning courses. Prior experience in e-learning courses was also found negatively related to learning. Contrary to the hypothesized, blended e-learning was found negatively related to learning.

Yaghoubi and Malekmohammadi(2008) studied **"Model for E-Learning in Higher Education of Agricultural Extension and Education in Iran".** *The purpose* of the research was to design a model for e-learning in higher agricultural extension and education in Iran. A descriptive–correlation survey approach was used in the study. Responds filled in a web-based closed questions questionnaire. Reliability and validity of instrument were determined by investigating the attitudes of e-learning and extension specialists. The study population consisted of graduate students of agricultural extension and education in Iran. A sample of 86 students was selected by using the stratified random sampling method. Based on the results, the main components for e-learning in higher agricultural extension and education in Iran were: (1) Students, (2) faculty members, (3) Educational interactions (4) Supporting Factors and (5) learning management system. Based on factor analysis, five most highly ranked items on requirements for students into e-learning in higher agricultural extension and education were identified as: responsibility, participation and creativity, IT skills, motivation and virtual ability. Most important item on requirements for faculty members was learning management and feedback. By factor analysis, factors of e-learning success in higher agricultural extension and education were reduced to two main factors, named as interactions and supporting factors and contents and educational tools.

Fetaji, Pop-Jordanova, Pop-Jordanov, Zorcec, and Markovska (2007) conducted a study **"Measuring E-learning Effectiveness through E-content And Attention Correlation"** The objectives of the study were to investigate the possibilities of improving and increasing accessibility to e-content and attention, both assessed from a previous study as most influencing e-learning indicators. Sample consisted of 36 Students from South East European University, Tetovo, Macedonia. Research Design used was exploratory research. Tool used for data collection were Psychometric tests, Psycho physiological measuring - Biofeedback test, ELUAT (E-learning Usability Attributes Testing). Major findings of the study found a strong correlation between the two e-learning indicators: e-content and attention. E-learning content (e-content) was the main vehicle behind knowledge dissemination and increased learning and it was primarily depended on learners' attention. Measuring the attention and e-content through the realised tests were concluded that the attention was dropping after the first task and later after the second task was again increasing. Rey Auditory Verbal Learning Test (RAVLT) showed highly organized ability for learning new knowledge as well as attention and concentration, which was

seen from the progression in the obtained new knowledge. Female subjects were learning much faster than the male subjects. No changes in the time of performance. After a few worse results, the students manifested improvement of the total time for performance (adaptation in the test situation). The commission's number was much greater after the third task (they were bored or tired, and the task was too hard). Omissions were greater after the four task (attention was diminishing because of boring or tiredness). The greater impulsive reaction (commissions) after the 5-th task could be interpreted with the feeling of boring / fatigue.

Section: II Development and Validation of E-content/ E-learning packages

Amutha (2016) conducted a research on "Impact of e-Content Integration in Science on the Learning of Students at Tertiary Level". The objectives were to develop and validate an e-content on cloning, to find out the effectiveness of the e-content on cloning, to develop an achievement test on cloning, to determine the level of performance in pre-test and post-test. Sample of the study was 60 undergraduate final year Botany students as a sample from colleges in Tiruchirappalli. Research Design was Experimental Research. Tool used for data collection was Knowledge Test. Major findings of the study revealed that students in both control and experimental group do not differ in their pre-test performance. It was imperative to take cognizance in the research study that the e-content integration into science learning did make no gender difference. The e-content integration was found effective with the science of learning of boys and girls in terms of providing equity pedagogy. Responses of the students through rubrics were as follows. The introduction part of the module was able to win the confidence of the students. Their response reveals that introduction provides relevant information and establishes a clear purpose of engaging the listener. Script for cloning was well planned. The story board was well written. Language was very simple and precise. As many as twenty six out of thirty students revealed that the e-content presents accurate information and concise concepts. Four of the students identified creativity and originality in the development of e-content. All the students felt that the whole e-content was easy to read with appropriate use of font size, bullets, and italics and bold for headings and subheadings. All the students felt that delivery by the investigator in the e-content was well rehearsed and smooth. Use of multimedia in the content evoked good feedback from the students. All the students revealed that the photographs, graphics, audio and video were appropriate and created interest. Forty percent of the students came out with

additional remarks that the graphics and animation were relevant to the audio and reinforce the content.

Sathya (2016) conducted a study on "Developing An E Content Module On The Poem The Road Not Taken". E-content module on a poem was created and implemented to post-graduate students to test its effectiveness. The study aimed to show that E-content module as one of the finest ways through which the learners could learn at any time, at anywhere and at any pace. It was user friendly and flexible for the learners. 35 post graduate students were randomly selected as the sample of the study. After implementing the E-Content module to the post-graduate students, the result was found through their feedbacks. 90% of the students accepted that the E-content module paves way for self learning. 85% of the students agreed that it improves language skills. 95% of the students conveyed that it helps to learn at anytime, at anywhere and at any pace. 92% of the students recommended e-content module for other subjects too. 95% of the students accepted that it is user-friendly and flexible. E-Content learning on a poem had a qualitative impact on the postgraduate students. It provided flexibility through which the students could learn outside the lecture hall at anytime, anywhere and at any pace. It made them to become self-directed independent learners. It was an effective mode for teaching poem with appropriate images, films, metaphors and other poetic devices. The mode facilitated the teacher and it could be used in the absence of teacher but it cannot replace the teacher.

Jebaraj and Mohanasundaram (2015) had undertaken a study on "Development of an e-Content on 'Crystal Structures' which included in the First Semester Syllabus of Engineering Physics subject of "Anna University, Chennai, Tamil Nadu" and to validate the developed e-Content. A pre-test, post-test two group experimental design was adopted. Sample of 60 First Year Engineering students were exposed to different treatments such as teaching through e-Content and conventional method of teaching. The study was focused on finding out the significant differences between control and experimental group of First Year Engineering students in their academic achievement while learning "Crystal Structures" with reference to gain scores. Intelligent Test–Test of "g": Culture Fair-Scale 2, and Achievement test were used to test gain in knowledge. The achievement scores were analyzed using different statistical

techniques. It was found that the experimental group students who were taught through e-Content material had better achievement scores than the control group students in learning "Crystal Structures".

Pathiratne (2015) carried out a study on "**Development and Validation of e-Content on "Thermodynamics" to Instruct Engineering Physics to Undergraduates".** The objectives of the study were to develop an e-Content on Thermodynamics, to validate the developed e-Content and to ascertain the efficacy of developed e-Content in edifying ―Thermodynamics‖ to first year Engineering Undergraduates. A pre-test, post-test two group experimental design was adopted. Sample of 60 First Year Engineering Undergraduates were exposed to different treatments such as edifying through e- Content and conventional method of edifying. The study was additionally fixated on ascertaining the consequential distinctions between control and experimental group of First Year Engineering Undergraduates in their academic achievement while learning―Thermodynamics‖ with reference to gain scores. The achievement scores were analyzed utilizing different statistical techniques. It was found that the experimental group. Undergraduates who were edified through e-Content material had better achievement scores than the control group Undergraduates in learning ―Thermodynamics.

Raval and Gohel (2014) conducted a study on "Construction and Effectiveness of E-Content for Educational Psychology." The study was conducted to construct an E-Content for Educational Psychology, to try-out the E-Content programme of Educational Psychology and to measure the effectiveness of E-Content with reference to gender.The sample of the study consisted of 58 (18 girls and 20 boys) trainees studying in B.Ed. Colleges of (Gujarati medium) Surendranagar City using the Random Sampling method. The study followed only post test experimental design. IQ test and achievement test were used as tools for data collection. Findings of the study revealed E-content programme was effective in comparison with traditional teaching method. It means students got higher achievement taught through E-content. E-content programme had equal effect on gander.

Vasuki, Sudha and Poornima(2014) conducted a study on "**Development and Validation of E-Content on French Revolution at Secondary Level".** The objectives of the study were to

develop and to validate e-content on the topic, The French Revolution in the subject History at secondary level. The study had been carried out at two levels. The first part of the research work included the development work included the development of e-content on the topic The French Revolution in the subject History for the secondary students. The second part of research works included testing the effectiveness of the developed e-content through peer group evaluation by way of the survey. .Convenience sampling techniques was used. As many as 20 M.Ed students of the Department of Educational Technology, Bharathidasan University, Tamil Nadu, India had been taken as sample for the purpose of evaluating the e-Content. On account of time constraint, it was decided to have the peer group evaluation of e-content using the EESM 1.2 version. was educational effectiveness standards model (EESM) was one of the best tools for evaluation of academic e-content. The major findings emerged from the study were, There was significant difference between the science and arts scholars with regard to Effectiveness of e-content, There was no significant difference between the urban and rural scholars with regard to the effectiveness of e-content, There was no significant difference between the mean scores of male and female with regard to the effectiveness of the e-content. The study revealed that e-content was effective in teaching History at secondary level.

Joan (2013) conducted a study on "Effect on e-content learning package in Mathematics education for the prospective teachers". The objectives were to measure the effectiveness of e-content learning package in learning Mathematics for prospective teachers. Sample was 30 students from college of education in Tamilnadu. Research Design was pre-post experimental design. Tool used for data collection was e-content learning package, knowledge test. Major Findings of the study revealed that there was significant difference between pre-post test scores for the experimental group in learning Mathematics. There was significant difference in the post-test scores of the experimental and control group. The investigator concluded that the experimental group has higher scores and thus, e-content learning package on Mathematics education for prospective teachers is effective.

Karthikeyan., Shanmugaraja, and Jayaraman(2012) conducted a study On **"E-Content Development On Teaching Method Of Tamil at B.Ed Level".** The objectives of the study were to prepare e-content development and validate for particular topic in teaching method of

Tamil at B.Ed level and to find out the effectiveness of e-content in the learning process. The investigator followed the Experimental method for the present study. The data thus collected were put into appropriate statistical analysis. Mean, standard deviation, t-test. The study was concerned only with B.Ed trainees in Oxford College of Education, Trichy. Twenty students have been selected for experimental group and another twenty students for control group. Both the groups were selected by using simple random sampling method. The major finding emerged from the study were that teaching through e-content was effective. While administering the e-content to the trainees, which was a self-instructional learning strategy it was found that e-content promoted active participation and encouraged vigilance. The e-content was found to have a beneficial effect on the learner achievement as a result of the unique combination of tutorial interactive and visual capabilities.

Patil (2011) investigated a research on **"Role of E-learning in Teachers Professional Development for Quality of Researches in Teacher Education**".The objectives of the study were to study the impact of programme on both male and female students and to study the effectiveness of programme with reference to higher education for all the Participated students. The all M.Ed. students (48=30 male students + 18 female students) of College Education, Barshi are made compulsory to attend the course (Programme). A pre-test of 30 marks on above unit was conducted and the data was analysed. The course content was taught within fifteen days with demonstration and practical. The students were tested within the course. A post-test of 30 marks was conducted and data was analysed. Findings of the study revealed that there was no significant difference between the performance of the male and female students in pretest and posttest. There was significant difference between the performances of the male and female students in pre over post testing. The developed e-learning programmehelped the male and female students in better understanding for the content.

Ramasamy and Hariharakrishnan (2010) conducted a study titled "Development and Validation of E-Content on Laser in Physics at College Level". The objective was to go for content validity based on the achievement test conducted to the final year B.Sc. students. There were three types of validity namely face, content and construct validity. An achievement test consisting of 15 objective items on the topic "Laser" is administered. The experiment was

conducted to establish the validity of the developed E-content. The achievement test in the topic laser was developed. 20 students from final year B.Sc. (Physics) of National College, Trichy were selected as samples for the study by using simple random sample. The achievement test score showed more than 80 % of the students have recorded more than 80 % in mastering the concept taught by using E-content. The study proved the effectiveness of E-content programme delivered to the College level students is helpful to attain optimum level in their studies.

Study done in Abroad:

Chiero, Beare, Marshall and Torgerson (2015) conducted a study on **"Evaluating the Effectiveness of E-learning in Teacher Preparation"**. The objectives were to describe and examine the effectiveness of an online-supported teacher preparation programme as compared with traditional campus-based programmes in the California State University. Sample was 9887 first year of professional teaching trainees and 3709 employment supervisors. Research Design was Experimental Design. Tool used for Data collection was Pre-test and Post Test- Knowledge Test. Major Findings were the sample sizes varied between the groups, with 9417 for the Traditional group and 470 CalStateTEACH respondents examining for differences between the pathways for the composite. Overall Effectiveness of the credential programme found statistical significance. The magnitude of advantage for CalStateTEACH (CST) preparation was consistent and noticeable and was significantly higher than the traditionally prepared group. The only non-significant comparison was for value of the fieldwork component of the programmes, rated quite high for both groups.

Research Trends of the review of literature:

The research trends of the reviewed literature studies ranged from 2006 to 2016, a decade time span was taken into consideration. Six studies of factors affecting e-learning, perception and readiness of students regarding e-learning were conducted in India and fourteen in Abroad in places like China, Spain, Jordan, Iran, Malaysia, Lebanon, Macedonia, whereas, no studies were found from the third world countries. Ten studies conducted in India belonged to the category of development and validation of e-content/ e-learning packages, whereas only one study reviewed was conducted in abroad. The trend suggests that from thirty one studies twenty studies conducted followed exploratory research and survey research design, whereas eleven studies

conducted followed experimental research design. Maximum size of sample in survey/ exploratory research design was 7717 and minimum sample size was 36, whereas in experimental research the maximum sample size was 9887 respondents and minimum sample size was 20 respondents. The study of largest sample size with experimental design was conducted in California, USA. Here it is observed that none of the study conducted in India had larger sample size. Trend of sampling technique suggests that maximum studies conducted used random sampling and purposive sampling technique. The tools used for data collection in reviewed studies were physical and e-questionnaire, knowledge/ achievement tests, IQ tests, EESM, Psychometric tests, Psychophysical measuring-bio-feedback test, ELUAT-e-learning usability attributes testing.

It was observed that factors like, Age, Gender, previous knowledge, technical skills, exposure to computer and internet, academic achievement, infrastructure facilities, cultural background and personal values significantly affect the perceptions and readiness of students in e-learning. Except one research reported gender to be non-significant for e-learning.

In all the experimental studies e-learning was found to be effective in teaching and learning content. Whereas, it was observed that students and teachers have readiness towards e-learning and had positive attitude. Some of the initiatives many institutions uploaded their courseware, recorded video sessions, interactive tele-conferencing sessions, online counselling sessions, sample question papers, question bans, online assignments, lab manuals on to their website. The most common available facilities of e-learning were online study material, online syllabus while assignment feedback, tests or quizzes, open forums, web seminars and digital libraries were the least available e-learning facilities. Regarding the benefits of e-learning, the stakeholders felt that access to information related to the course content becomes easy and fast in the e-learning platform, flexibility and interesting content, the audio-visual aspects made learning more interesting and long lasting and further it is easy to reach more students in less time. They all almost equally felt that e-learning platform provides the scope for learning at own pace, at any time, in one of the studies it was also reported that it can help remove the cultural barrier of studying away from home. The e-contents were developed on the subjects like Thermodynamics,

literature, educational psychology, mathematics, agriculture extension and education, science crystal structures and laser physics. None of the study was found in the area of communication.

Conclusion:

There exists a paradox in eLearning among various institutes. Few institutions join the race, while the rest suffer from lack of knowledge or from lack of realization of the importance of eLearning. Institutes like IITs, NITs, MIT are adopting all latest technologies and are keeping their students enlightened from various parts of the world. eLearning has vast potential in India. UGC, NAAC, ICSSR, DBT, NCERT, ICHR, NEEPA, AICTE and other agencies of ISO 9000 family are pushing from various directions to bring the slow growers to walk with the rest. Thus it was felt to conduct a study on "Development and Validation of e-content on *"Introduction to Extension & Communication"* for Universities and Students to contribute in the area of e-learning and higher education.