ISSN: 2395-1664 (ONLINE)
DOI: 10.21917/ijms.2022.0225

EMERGING TRENDS IN RESEARCH AND PEDAGOGY REGARDING BUSINESS ANALYTICS - OPPORTUNITIES AND CHALLENGES IN HIGHER EDUCATION IN INDIA - 21 ST CENTURY-A SYSTEMATIC LITERATURE REVIEW

V. Venkateswara Rao
Department of Management Studies, Velidi Venkateswarlu and Mangamma Degree College, India

Abstract

The Advancement of technology has provided the opportunity to track and store students' learning activities as big data sets within online environments. Big data refers to the capability of storing large quantities of data over an extended period and down to particular transactions. Educational data mining focuses on developing and implementing methods to promote discoveries from data in educational settings. It examines patterns in a large data set related to students' actions. Learning analytics uses predictive models that provide actionable information. It is a multidisciplinary approach based on data processing, technology-learning enhancement, educational data mining, and visualization. LA increases awareness of learners and educators in their current situations that can help them make constructive decisions and more effectively perform their tasks. The literature review revealed that LA uses various methods including visual data analysis techniques, social network analysis, semantic, and educational data mining including prediction, clustering, relationship mining, discovery with models, and separation of data for human judgment to analyze data. Challenges include issues related to data tracking, collection, evaluation, analysis, lack of connection to learning sciences, optimizing learning environments, and ethical and privacy issues. Such a comprehensive overview provides an integrative report for faculty, course developers, and administrators about the methods, benefits, and challenges of LA so that they may apply LA more effectively to improve teaching and learning in higher education. This study has revealed the different methods used by learning analytics not only to show how the use of big data can benefit education but also to reveal the challenges faced by stakeholders in the educational process.

Keywords:

Learning Analytics, Data Processing, Technology-Learning Enhancement

1. INTRODUCTION

Today, in higher education new tools and strategies offer a wider range of personalized learning opportunities are encouraging making education more impressive. New pedagogies are supporting individual learning strategies for knowledge development and self-directed learning [1]. The new challenge before the country at the beginning of the twenty-first century is to become a developed society, which requires a vibrant economy driven by knowledge and has to be ushered in soon and also a new society where justice and human values prevail has to be created. Since education systems are traditionally developing slowly [2]. In higher education, new tools and strategies offer a wider range of personalized learning opportunities. Digital technology in higher education has led to an increased interest in considering its potential applications in education [3]-[6]. The move from instructor- to learner-based education is a major paradigm shift, both fueled and supported by advances in technology. The affordability of low-cost mobile technology has induced intense interest and experimentation. The challenge is to make effective use of new technologies while preparing students for productive lives in the 21st century. Businesses seek to keep up to date with rapidly changing technology through training, and students must be prepared for life-long learning to keep up with transformations in work and workplaces [7]. However, there is a considerable body of literature arguing that current education systems are failing learners in an increasingly digital world. Technology is transforming the teaching process into one that is more interactive, allowing working collaboratively to share ideas, documents, and videos in a cloud-based environment. It allows teachers to focus on how the technological, and pedagogical content knowledge is changing the student's interactions with their learning goals [8].

With the fast development of the Internet, many colleges and universities have offered online courses as a viable alternative to traditional face-to-face instruction [9]. However, considerable concerns and problems have developed, particularly as it relates to the quality of online education [10]. Online education, according to Harasim, is a new domain of learning that combines distance education with the practice of face-to-face instruction utilizing computer-mediated communication. As cough suggested that online education has the following features:

- It provides a learning experience different than in the traditional classroom because learners are different,
- The communication is via computer and World Wide Web,
- Participation in the classroom by learners is different,
- The social dynamic of the learning environment is changed, and
- discrimination and prejudice are minimized.

2. STATEMENT OF THE PROBLEM

Although it is had been reported in a recent study that 80% of course content offered in institutions of higher learning is being delivered online [4], students in this study were still reluctant to take online courses and complained about the online classes they had taken.

2.1 PURPOSE OF THE STUDY

Although the literature regarding online education is expanding, studies related to the quality of online education are limited. Among those examined, few researchers have examined the quality of online education from the students' perspective. Therefore, there is a need to investigate students' perceptions of the quality of online education. The purpose of this study was to examine the quality of existing online education courses that utilize the Internet as the primary instructional delivery method.

The focus of this study was to examine students' perceptions of the quality of online education. The findings of this study may contribute to the literature on online education in terms of quality assurance. The results should hopefully enable institutions offering online education to evaluate their programs based on the findings and the recommendations in this study [10].

Technological advances in telecommunications combined with Web-enabled technologies have created a new technology known as "Internet Communications Technologies (ICT) and Teaching Technologies." This new technology has changed the concepts of education. Asynchronous Network Learning (ANL), Web-based education (WBE), and eLearning are different names for education on the Web. WBE is becoming so popular that many for-profit colleges and universities are emerging, providing stiff competition to traditional universities. Public and private colleges and universities, from all over the world, are facing the many challenges and opportunities offered by this new technology-based concept. WBE is diffusing across disciplines, curriculums, levels, and even national boundaries. WBE is not limited to the privileged few. Like any emerging technology, "ICT and Teaching Technologies" is not free from problems, controversies, and challenges. There are proponents and opponents of Web-based education, generating anxiety but also some interesting discussions. As many new universities are joining WBE, many old ones are failing. Educators need to be aware of the discussions and learn from the successes and failures of the early adopters [11].

3. OBJECTIVES

- To know the Emerging trends in research and pedagogy.
- To survey the Digital situation of higher education in India
- To detect the issues and challenges in higher education in India.
- To find the methods of recent learning responsible.
- To suggest some remedial measures for how to combat these challenges.

3.1 IMPORTANCE OF THE STUDY

In this context, the present paper holds the immediate significance of creating awareness of many issues of concern to be taken care of by the stakeholders at the national as well as the global levels. The study is also unique in the sense that it brings about a better understanding of the present scenario in the higher education system in the country and its pattern of growth given the opportunities and challenges to the system under consideration. The present study throws a gainful insight into financing schemes and enrolment aspects of higher education in India. Academic administrators, policymakers, educational institutions, and researchers will find the insights of the present study of use for various purposes.

4. PEDAGOGY - INTEGRATION OF HIGHER EDUCATIONAL TECHNOLOGIES

Pedagogy needs to enable different ways of learning and rethink students' interactions with specific topics. The role of technology in schools increases and can help to make schools more effective and engaging. Young people appreciate digital technologies to connect, communicate, play, create and learn in ways never imagined just a few years ago. They need to develop confidence and skills for research on issues they are interested in by themselves. Education needs to empower young people to use these resources confidently and wisely and in positive ways. Students cannot simply be taught specific solutions; they must be prepared to learn how to learn.

4.1 DIGITAL TOOLS IN EDUCATION TECHNOLOGY

It is now heavily involved in learning processes where students get deeper, active learning experiences. Educational technology provides the digital resources that open doors and minds to diverse learning models and teaching strategies. Depending on the goal of learning a growing range of options are available for enhancing teaching in face-to-face classroom settings by delivering information via digital technologies. Options are collaboration and other class activities, peer assessment, web-based tutorials, online courses, video conferencing, multimedia presentations, and computer-assisted instruction delivered over a network, available also for using wireless hand-held devices. Tools are available for feedback and grading, student to student and student to instructor interactions, collaborative activities etc [12].

4.2 FORMULATING THE PROBLEM

The problem is that embracing LA in evaluating data in higher education diverts educators' attention from clearly identifying methods, benefits, and challenges of using LA in higher education. These three key components need further clarification for higher education stakeholders to help them effectively apply learning analytics in higher education. Educators have to go through the daunting task of sifting through the literature to become familiar with LA methods, benefits, and challenges [13].

5. DATA COLLECTION

The purpose of data collection was to find empirical studies including quantitative, qualitative, mixed methods, and literature reviews published in peer-reviewed journals since 2000 to identify methods, challenges, and benefits of LA in higher education.

5.1 LEARNING ANALYTICS METHODS IN EDUCATION

The following methods and analysis approaches inform faculty, educators, and administrators in higher education who are not experts in LA about the available methods reported in the literature. Such an overview provides an integrative report for educators and saves them from the daunting task of a literature search to become familiar with different LA methods. Analytical evaluations differ from empirical evaluations in that analytical evaluations do not include user observations. Reviewers, most often experts, rely on data and quantitative criteria when conducting evaluations. The goal of an analytical evaluation is to

establish relationships between actual and benchmark data to determine whether variations exist.

5.2 COGNITIVE WALKTHROUGH METHOD

Software developers commonly use cognitive walk-through evaluations in the design phase of development. The goal is to identify strengths and weaknesses in a prototype design and how users will understand it. Data sources include a user interface mock-up, a user profile that assumes a specific knowledge level, task lists and action sequence diagrams. A cognitive walk-through starts with an analysis of the steps and actions required to accomplish a task, and system responses to user actions. Evaluators, type designers and developers, then walk through the steps as a group, gathering usability data along the way. Analysis determines whether tasks or actions require a redesign [14].

5.3 HEURISTIC EVALUATION

Unlike the team approach used in a cognitive walk-through, a heuristic evaluation is a series of independent evaluations. It is useful in analyzing operational processes, developing standard operating procedures and writing an instructions manual. Data sources include established guidelines and performance measurements. During the evaluation, two or three analysts compare current procedures against pre-established guidelines or principles, with each looking for and ranking a specific issue such as unsafe, erroneous, and duplicate or redundant actions [8]. A post-evaluation meeting and analysis determine which instructions require modification.

5.4 POINT-FACTOR METHOD

Point-factor evaluations are common in job evaluations. Goals typically focus on ranking different jobs within a company and establishing a pay grade or structure. Data sources include role profiles, job descriptions and a numerical ranking system. In a point-factor evaluation, reviewers -- who most often are human resources staff members -- identify and break the key elements of each job into separate components [6]. Evaluators then compare these factors to role profiles and allocate points according to the skills, expertise or level of difficulty of each specific job. Most often, the more demanding a job is, the higher the point value and the higher its pay grade.

6. CHALLENGES OF HIGHER EDUCATION

The National Education Policy 2020 is a welcome and ambitious re-imagination of India's education system into a modern, progressive and equitable one. Successful execution of this policy calls for dramatic simplification of decision-making structures and re-prioritization of budgetary resources in months and years to come. The pressure on students and higher education institutions is high. Schools and universities have been closed and exams postponed. Classrooms are going virtual and admissions for the upcoming academic year are fraught with confusion. According to UNESCO, over 320 million students in Indian schools and colleges are currently impacted. The pandemic has pushed the world to drastically reinvent ways of coping with the ‘new normal. After the initial phase of the complete overhaul, it is critical to understand the short and long-term impact and future measures. Some other challenges that need to be addressed include the shortage of quality teachers and the lack of research competencies among the faculty.

6.1 ONLINE LEARNING

An immediate and effective response to the crisis was to go digital. Developing robust online platforms has become necessary to offer continuity in learning. Yet in a developing country like India with the vast disparity in socio-economic backgrounds of students and the quality of educational institutions, the shift has not been easy. The digital divide has been further widening the gap and needs urgent attention from both public and private sector players as the crisis continues. Good teachers refreshed curricula and effective tools will ensure students stay involved and active in the learning process [5].

6.2 EFFECTS OF THE SHRINKING GLOBAL ECONOMY

The economy has ripples and can be felt in the education sector as well. While many students will chart alternative paths, the pandemic is also leaving others in limbo. As unemployment is predicted to increase and the financial capacity of Indian homes comes under stress, the country can expect a drop in enrolments and challenges with tuition fees. Public institutions too may be under threat of reduced funding. On the flip side, the pandemic could also prompt reform in fee structures and the creation of more cost-effective programs [7].

7. NEW TRENDS IN TEACHING AND LEARNING WILL EMERGE

Indian academia has needed transformation, long before the onset of the pandemic. Digital learning is leading the charge as a mainstay, and many new trends are picking up momentum across the globe. Multidisciplinary and modular pedagogy that afford transferable skills and customized learning will succeed. Post-pandemic times could see a blend of e-learning and mainstream face-to-face teaching with a boost from traditional universities and the educational and technological sector. Innovative new forms of collaboration and alternative paradigms are needed to drive learning, research and teaching. Sharing of knowledge between institutions globally through joint-teaching, virtual guest lectures, etc. could give students an enriched global perspective in these difficult times.

7.1 PAUCITY OF TEACHERS

A paucity of contemporary teachers has been a pressing challenge already, and it is growing more serious. Faculties are being called upon to redesign course content to meet current and future needs. Moving away from traditional pedagogies in most average institutions, the demand for quality educators will shape the way higher education moves forward from this crisis.

7.2 POTENTIAL FOR FURTHER EXPANSION

Indian higher education system has traditionally been a slow-growing state-supported sector. The gross enrolment ratio (GER) was low at 8.1 per cent in 2000. The adoption of market-friendly reforms in this century relieved the sector from relying on public

funding for its expansion. The proliferation of private institutions and the multiplication of student numbers resulted in the massification of the sector. With a GER of 25.8 and more than 900 universities, 40,000 colleges, 1.3 million teachers and 36.6 million students in 2017-18, the Indian higher education sector has become the second-largest in the world.

7.3 INTERNATIONALIZATION OF HIGHER EDUCATION

Internationalization in the present context takes place mainly through cross-border mobility of programs, students, institutions and teachers. India is the second-largest sending country in the world, to pursue higher education is only around the globe. Indian students enrol in large numbers (second largest) in MOOCs and Indian professors cross borders quite often. Globalization has fostered considerable demand for higher education throughout the world, as greater levels of remuneration accrue at higher levels of education. Communication technologies such as the internet and its websites make it possible for higher education courses to reach individuals in distant places and at times convenient for them.

Digital knowledge: Major structural and behavioural problems, the challenge of maintaining the quality of program delivery. Poor rate of technology adoption and archaic pedagogical tools employed by higher educational institutions, coupled with regulatory constraints, are some of the other problems that continue to affect the development of this sector.

7.4 IMMINENT SHIFT AND WAY FORWARD

Higher education in India is all set to be revolutionised thanks to the rapid and drastic changes impacting the various constituents of the business environment. Naturally, the industry is demanding managerial talent that is equipped with new-age capabilities and skills. This overhaul is likely to comprehensively reform the design, content, and delivery of management education in the country. We envisage the following dimensions of this impending transformation [2].

India's much-awaited 'New Education Policy (NEP): in spirit, a harbinger of directional change and sectoral reforms, is expected to open fresh avenues for India's education sector in the 21st century. Particularly welcoming for the industry are its focus on the use of technology for seamless learning, holistic, multi-disciplinary education from the under-graduation level itself, institutional and academic autonomy as well as an independent National Research Foundation. The intent of spending six per cent of GDP on education will make the defining change. Industry lauds the reformatory step by Honorable PMO by announcing a National Education Policy 2020. This policy was long due, to disrupt the current education system and bring the transformation to learn and turn the future Indian minds [3].

I am delighted to see a diverse policy that aims to meet future learning needs which will engrain practical skill-based learning to shape the learners to be Industry ready. The policy very well addresses most of the critical issues that daunt our current education landscape and brings about a totality in terms of the paradigm shift that we need for educated and skilled people in India. The NEP will offer multiple exit points in studies, which means that one could get into employment at different ages, different times, and at different levels of education which is a thoughtful strategic structure [8].

7.5 PREPARING FOR THE FUTURE

Various exercises can be used by academic staff and their management to develop strategies and tactics to address deficiencies, acquire inward investments by capitalizing on human and other resources, bring about a major change in direction, or deal with threats and competitors. These exercises should be encouraged, and if properly managed, can act as a way to bring about harmonious relationships and dynamism in staff groupings. With the explosive growth of knowledge in the past and with the development of handy tools of information and communication technologies as well as other scientific innovations, competency has become a hallmark of growth all over the World.

7.6 SUGGESTIONS FOR IMPROVING THE HIGHER EDUCATION SYSTEM

- There is a need to implement an innovative and transformational approach from primary to higher education levels to make the Indian educational system globally more relevant and competitive.
- Higher educational institutes need to improve quality and reputation. There should be a good infrastructure of colleges and universities which may attract the students.
- Government must promote collaboration between Indian higher education institutes and top international institutes and also generates linkage between national research laboratories and research centres of top institutions for better quality and collaborative research. There is a need to focus on the graduate students by providing them such courses in which they can achieve excellence, and gain a deeper knowledge of the subject so that they will get jobs after recruitment in the companies which would reduce the unnecessary rush to the higher education.
- Universities and colleges both public-private must be away from the political affiliations, Favoritism; the money-making process should be out of the education system etc.
- There should be a multidisciplinary approach in higher education so that students' knowledge may not be restricted only to their subjects.

8. CONCLUSION

The majority of our colleges have become mere breeding centres for producing students with degree certificates rather than individuals with critical analytical skills and innovative thinking. And most of the time, the students passing out of college do not processes employable skills. There is a need to completely overhaul our education system. We need to change the system and change has to be for good. The time has come for universities to forge organic links with industries and impart skills to the students to the requirement of the industry. Some universities are acting in this direction, but it is not enough and there is a need for a paradigm shift in teaching and learning methodologies of our universities to enable the students to face global competition

effectively and with confidence. Our challenge is to ensure the spread of knowledge to every section and every corner of our country. Our youth need opportunities and those avenues have to be created by imparting the right kind of education, training and skills so that they do not only become job seekers but also job creators. Through this paper, the investigator tries to present the existing scenario of higher education in India, the emerging issues and challenges, the responsible factors and some remedial measures to combat these challenges. The challenge may be to manage equity and diversity in a technology-mediated market framework of expansion the curriculum relevance, quality of learning and employment outcomes will continue to be a challenge in the future and several initiatives and heavy investments made in internationalization will make India an education hub and a global player in education shortly. The current wave of turbulence caused by the twin influences of technology disruption and the pandemic has exposed the weaknesses in our Indian Higher education and the need for urgent remedial action to address them. To reach and achieve the future requirements there is an urgent need to relook at the financial resources, access and equity, quality standards, relevance, infrastructure and in the end the responsiveness.

REFERENCES

[1] Obadya Ray Shaguri, "Higher Education in India Access, Equity, Quality", Available at https://docplayer.net/6311022-Higher-education-in-india-access-equity-quality-obadya-ray-shaguri.html, Accessed at 2013.

[2] Zareer Masani, "India Still Asia's Reluctant Tiger, BBC Radio 4", Special Report: The Education Race, pp. 1-56, 2011.

[3] Sramana Mitra, "How To Save The World's Back Office of Forbes", Available at https://www.forbes.com/2008/03/13/mitra-india-outsourcing-tech-enter-x_sm_0314outsource.html?sh=336b84513977. Accessed at 2008.

[4] Fabrics Henard, "Learning our Lesson: Review of Quality teaching in Higher Education", OECD Publisher, 2012.

[5] P. Arunachalam, "Higher Education Sector in India: Issues and Imperatives", *Journal of Global Economy*, Vol. 6, No 4, pp. 1-14, 2010.

[6] S. Mallick, "Privatization of Education: A Boon or A Bane?", Available at http://www.geocities.com/husociology/privatization.htm, Accessed at 2001.

[7] Dukkipati Uttara, "Higher Education in India: Sustaining Long Term Growth", South Asia Monitor, Available at https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/sam_141.pdf, Accessed at 2010.

[8] Debkumar Mukherjee, "Higher Education in India-Concerns and Strategies", *Journal of Education and Practices*, Vol. 3, No. 2, pp. 17-24, 2010.

[9] Sumeet Gupta, "Higher Education in India: Twelfth Five Year Plan (2012–2017) and Beyond", Available at https://www.ficci-hes.com/eny-report.html, Accessed at 2012.

[10] Higher Education in India: Issues, Concerns and New Directions, Available at http://www.ugc.ac.in/pub/heindia.pdf, Accessed at 2019.

[11] American Federation of Teachers, "Higher Education Program and Policy Council", Available at http://www.aft.org/higher_ed/downloadable/distance.pdf, Accessed at 2000.

[12] J.F. Chizmar and M.S. Walber, "Web-Based Learning Environments Guided by Principles of Good Teaching Practice", *Journal of Economic Education*, Vol. 3, No. 2, pp. 248-264, 1999.

[13] Institute for Higher Education Policy, "Quality on the line: benchmarks for success in Internet-base distance education. Washington, DC: Institute for Higher Education Accreditation", Available at http://www.ihep.org/Pubs/PDF/Quality.pdf, Accessed at 1999.

[14] L.A. Petrides, "Web-Based Technologies for Distributed (or Distance) Learning: Creating Learner-Centered Educational Experiences in the Higher Education Classroom", *International Journal of Instructional Media*, Vol. 29, No. 1, pp. 69-77, 2002.