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**Varghese Panthalookaran**

Onset of Entrepreneurial Universities in India

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# Onset of Entrepreneurial Universities in India

Varghese Panthaloorkan\*

Even as the purpose of education in every generation was seemingly identical, its conduct had to account for the emerging socio-technological contexts. The purpose of education was always to equip individual learners to make unique contributions to the world. However, the ways of their formation kept changing from generation to generation. Any process that did not adapt according to the changed scenarios got redundant and was relegated to oblivion in the course of time. Like any natural occurrence, new scenarios appeared without prior intimation, caught your imagination, remade everything new and then silently departed. Time and tide wait for none! A wise educationalist shall be watchful to capture the onset of the newness and respond to it with an entrepreneurial spirit.

## Travails of VUCA (Volatile, Uncertain, Complex and Ambiguous) World

Those who are born in this age are popularly known as 'digital natives' immigrants' (Prensky, 2001). They possess some typical features that are absent in the older generation who are categorized as 'digital migrants'. Digital natives are born into an 'age of acceleration', into a global network of enormity and complexity (Cambi, 2018). They are compelled to deliver quick and decisive intellection to cope with the agile dynamics of the age of acceleration. Such a world marked with turbulent dynamics was described by Barber as a VUCA world (Barber, 1992), where VUCA is an acronym that captures the volatility, uncertainty, complexity, and ambiguity of the changes happening in the age of acceleration.

The concept of VUCA is said to have its origin in (Bennis & Nanus, 1985), which was later adopted into the curriculum of U.S. Army War College by 1987. In this sense, VUCA has a war origin and to understand the concept one may have to understand its interpretation by US army. According to Captain Ronald Fry of U.S. army, every other war including the World War I, the World War II, and the Cold War that U.S. fought happened in the field with known enemies and was defined by known tactics of engagement, aggression, combat, and was long term in nature (Fry, 2016). However, everything changed since the 9/11 attack on the World Trade Centre, which was characterized by a new guerrilla tactics of ambush, infiltration, and insurgency, an unpredictable warfare. That elicited novel responses from U.S. Army and a redefinition of their military training program (Rimita, 2019). However, the apparent insufficiency of the VUCA responses of US army towards the emerging VUCA realities is evidenced by their chaotic withdrawal of U.S. army from Afghanistan after 20 years of occupation in recent times (31<sup>st</sup> August, 2021).

\* Professor, Rajagiri School of Engineering and Technology Rajagiri Valley P.O. Kochi, 682039. E-mail : panthaloorkanemi@gmail.com

VUCA simultaneously describes unique features of an increasingly interconnected world, challenged by exacerbating environmental conditions, severe economic challenges, uneven distribution of wealth, and geopolitical crises (Heinonen, et al. 2017). VUCA has intensified the processes of globalization and digitalization by its catalyzing effect. With globalization, the repository of information got universalized making it practically available to anyone, anywhere and anytime. Digitalization has transformed life- and workspaces of the digital natives, increasingly complementing their cognitive skills, making services of digital natives redundant in their workspaces (Panthalookaran, 2021). Digital natives are condemned to be creative to venture beyond the reach of artificial intelligence by nurturing their unique and surpassing core competencies to keep themselves relevant in the life and careers (Panthalookaran, 2019). Both globalization and digitalization have accelerated the emergence of a VUCA world, requiring digital natives to reimagine the processes of education to equip them for the emerging life- and workspaces.

In short, VUCA does not confine itself to the war zones; it permeates itself to every walk of life of the digital natives. Turbulences experienced in the workspaces of the day is often ascribed to the presence of VUCA (Stiehm and Townsend, 2002). Johansen (2007) has defined VUCA as an obvious conceptual framework of 21<sup>st</sup> century life-and workspaces.

### **VUCA in Education**

Presence of VUCA defines a situation full of instability and unpredictability, leading to the feelings of insecurity, loss of motivation, decline of creativity and erosion of trust and paralysis of decision making. Hence, it is important that the conduct of education in modern times nurture the abilities of the learners to transform VUCA problems into VUCA competencies. As Johansen and Euchner suggest, digital natives shall transform VUCA challenges to VUCA opportunities (Johansen & Euchner, 2013). New generation education shall make digital natives VUCA-fit.

The turbulent transitions of VUCA realities taking place today in the world of technology and commerce keep influencing the conduct of education world over. It calls for its revisualization, recalibration and redefinition of the processes associated with education. In a world driven by VUCA realities (VUCA refers to the volatility of information, uncertainty in their understanding, complexity of their relational networks and ambiguity of their meaning), the process of making

learners future-ready has become a VUCA task. It requires the educationalists to exercise constant vigil over the turbulent transitions happening on the field. Concepts of an entrepreneurial conduct of education and entrepreneurial universities are two important elements of the responses offered by the world of education towards the unpredictable evolution of the future evolution of the education sector under the influence of VUCA.

### **How to Make Education VUCA-FIT**

Revised Bloom's Taxonomy is one of the major schemes for curriculum development, assessment and accreditation widely employed in the world today (Anderson & Krathwohl, 2001). Research suggests that the process of education in the modern era shall venture beyond the purview of Revised Bloom's Taxonomy (Panthalookaran, 2021). It is high time to embark upon an entrepreneurial pedagogy for pre-primary, primary and secondary education, which intends to make the new generation learners future-ready in a VUCA world.

Bill George, a senior fellow at Harvard Business School presents a VUCA response matrix, which allows the digital natives to manage and master VUCA-driven processes of today's world (George, 2017). The elements of the VUCA Response matrix are respectively, vision, understanding, courage and adaptability, which named as VUCA 2.0. Here, vision is an ability to see through the chaos created out of volatility of the system. Individuals and institutions shall keep an eye on their 'True North', viz., their vision, mission, values, and strategies to be able to navigate in the right directions (George, 2015). They shall not allow volatile events pull their decisions apart or be led astray from their life's mission. Further, understanding is necessary to counter the VUCA uncertainty arising from lack of quality information. Understanding consists of in-depth insight into own capabilities, equipping individuals and organizations to convert any volatile event for their advantage. They shall tap into different sources covering a full spectrum of viewpoints to ensure that they are updated with diverse perspectives on any emerging scenario. They shall listen both to the experts as well as to the ordinary stakeholders of their organization with this purpose in their mind. Courage is an apt response to VUCA complexity, arising out of multiply connected but quality information. Individuals and institutions shall venture to take calculated risks to create their future, rather than shying away from bold assertion of their will and purpose. They shall keep their audacity bolstering to be able to take daring decisions,

which would spell out the difference between success and failure in the face of complexities. Adaptability defines a fitting response towards VUCA ambiguity. Here, individuals and institutions respond to ambiguity armed with a range of flexible plans and strategies. Recourse to a policy-of-small-steps may prove useful in the face of ambiguity, as that facilitates quicker course corrections, if required.

Accordingly, the VUCA volatility can be resolved by developing a vision in the learners, which requires that education is learner-driven or autonomous. Education shall impart clarity of the meaning direction to the learners, leading them gradually towards the revelation of their unique call and mission in the world. This shall instill in them an awareness that they are the masters of their own destiny and are condemned to traverse a unique path of life purely based on their passion and plan. VUCA uncertainty shall alert learners to develop a renewed understanding of what they have already learned, constantly updating them by engaging in a lifelong learning. Learners shall overcome the VUCA complexity by mustering courage to venture into concrete realization of their thoughts into actions, thus creating the future. This calls for a venturesome learning, which is oriented towards transformation of their seed ideas into solution to some perennial problems or into some useful products or services. Finally, VUCA ambiguity shall be addressed by improving the adaptability of the learner's mind via a kind of flexible learning. Within a suitable ecosystem these learning approaches shall contribute towards making new generation learners future-ready. This process shall start from preschools till reaching the pre-university levels of schooling.

Correspondingly, higher education institutions shall make appropriate paradigmatic changes, so that learners graduating from them are ready to offer creative responses towards the challenges of a VUCA world. This necessitates that the learning processes at university level makes an entrepreneurial paradigm shift. Universities and other higher education institutions also become entrepreneurially oriented institutions. It is a call for an entrepreneurial makeover for higher education institutions in India and beyond.

### **Entrepreneurial Awakening of India**

India has shown signs of an awakening to an entrepreneurial phase of economic growth in recent years. As per the Hurun India Future Unicorn List released in September, 2021, India occupies the third position after USA and China in the total number of Unicorns developed till date, with 51 of them in the list.

The trend is positive and progressive, with the addition of circa 3 Unicorns every month in the current year.

As per the report of the Startup Mission, India has the 3rd largest startup ecosystem in the world; expected to witness YoY growth of 12-15%. India has about 50,000 startups in 2018; around 8,900 – 9,300 of these are technology led startups. 1300 new tech startups were born in 2019 alone implying that there are 2-3 tech startups born every day. The report also observes some interesting facts over the Startup Ecosystem in India: 1) The number of incubators and accelerators has grown 11%, 2) the number of women entrepreneurs stood at 14%, up from 10% and 11% in the previous two years, 3) Startups in the country have been able to create an estimated 40,000 new jobs over the year, taking the total jobs in the start-up ecosystem to 1.6-1.7 lakh, 4) Bangalore has been listed within the world's 20 leading startup cities in the 2019 Startup Genome Project ranking. It is also ranked as one of the world's five fastest growing startup cities. Entrepreneurial makeover of Indian economy is here to stay!

At the same time, we cannot afford to close our eyes on the fact that Indian economy continues to be in an extremely fragile state, seriously fractured by the imbalances of sectoral and regional growth and by the ever-increasing wedge between the rich and poor. Such factors are extremely powerful that they could single-handedly lead the national economy to permanent recession and chaos in the years to come. Hence, it is necessary that the new generation learners are equipped to be job-creators rather than as jobseekers. An entrepreneurial transformation of education is, therefore, the need of the hour both to accelerate the momentum of the entrepreneurial revolution under way and to promote further creation of adequate jobs in the country.

### **Unique Socio-cultural Features of India**

In view of an accelerated development of this trend, one shall engineer this social change considering some perennial features of socio-cultural realities of India, which influence any entrepreneurial transformation of education in the country. Let us try to delineate a few of such features with impact for the contemporary realities.

One important insight shall be that one shall not underestimate the influences of the travails of the erstwhile caste-system practised across India for many centuries. Even as it is legally banned, it exerts telling influence on the learners today in India. It is found that, many Indian students still hesitate to leave their

traditional occupations. Better said, they do not receive a shot in the arm from their families or from the society at large. As a result, they are rendered incapable of selecting their career according to their capacity, tastes, interests, and aspirations, etc. Further, according to the precepts of caste system, business and commercial activities are reserved to a particular caste, namely the *vaishya*. In short, concepts of caste-based or hereditary occupation may come in the way of entrepreneurial motivation of new generation Indians.

To diffuse this tendency, meaning of entrepreneurship may have to be described in a multifaceted manner. Accordingly, entrepreneurship shall be conceived as permeating into every other sphere of life. It shall be considered influencing every other discipline studied by the learner, including mathematics, sciences, arts, politics, and commerce, etc. Incidentally, entrepreneurial developments in arts and leisure are predicted to gain prominence in a digitalized world. Hence, a polychromatic perspective is a must as it relates to an entrepreneurial transformation of tertiary education in India.

Another factor shall be the exploitation of the distributed nature of the higher education institutions across the rural and urban regions of the country. In 2017, the rural population of India amounted to about 450 million, which is estimated to touch 506 million in 2022. Similarly, the urban population is predicted to grow from 889 million in 2017 to 905 million in 2022. Following this trend, 60.56% of the tertiary level educational institutions are in the rural areas. This provides a golden opportunity to ensure a balanced and self-reliant (Hindi: *Atmanirbhar*) growth of the nation, riding on the regional spread of tertiary education institutions. However, it requires that every higher education institution shall be cultivated as nodal centre of regional entrepreneurial development with a global perspective, development of India as a welfare nation can be efficiently achieved.

Another promising factor of Indian higher education sector, with respect to its entrepreneurial transformation, is the diversity of the nation. With 22 official languages included into the Eighth Schedule of the Constitution of India and with more than 19500 mother tongues spoken, India remains a vast multilingual and polyethnic culture. It also has more than two thousand ethnic groups with every major world religion represented therein. With many cuisines and culinary practices, art forms and sports and games, India defines itself as a truly composite culture. All these diversities of the nation shall have to be accepted as a

fertile breeding ground for creativity and innovation, which can be nurtured by appropriate entrepreneurial education. Hence, to be able to fully utilize the available diversity, an entrepreneurial transformation of India shall focus on its regional diversities with a global perspective.

Yet another interesting aspect of India, is its youthfulness. In 2020, the average age of an Indian was 29 years, compared to 37 for China and 48 for Japan. Accordingly, working age population currently grows larger than its dependent population, viz. children aged 14 years or below and people above 65 years of age. This fact is often portrayed as the demographic dividend of India, which is expected to accelerate the economic growth of India by boosting up its per capita income. However, the employment figures over many past years indicate that the absorption of the Indian youth into the labour force is not as high as predicted. It is often attributed to the poor employability of the workforce, which is severely affected by a deficit in educational attainment and health (Chandrasekhar, et al., 2006). Hence, it is an urgent matter of concern for the nation to bring about an immediate entrepreneurial transformation of the university level education, which shall reverse this trend in the job market by generating additional jobs or self-employment.

These and other socio-economic features of modern-day India are scheduled to radically influence the onset of an entrepreneurial paradigm shift in the conduct of education of the nation. Hence, policy makers shall be extra-vigilant to take them into cognizance and finetune and calibrate the policies they develop for making India future-ready.

### **Call for Entrepreneurial Universities**

David Kirby (2020) describes an entrepreneurial universities by as organizations with abilities to innovate, recognize and create opportunities, take risks, and respond to challenges. Entrepreneurial universities shall be equipped to sell their solutions, products, and services within the emerging knowledge economy. They shall operate as natural incubators that support the creation of new ventures by its academics, technicians, and students. They shall be agents of job creation and wealth creation in the regions and communities they are situated, contributing to the creation of entrepreneurship, buildup of startups, scientific accompaniment of the existing industries and organizations. They shall also take lead in the development of global networks for the local industries and organizations. In this manner, every university shall act as the locus of business and commercial pursuits of the place.

Accordingly, the research conducted in entrepreneurial universities shall primarily be based on the pertinent problems of the local industries, communities, and organizations. An entrepreneurial university shall develop an umbilical cord relation with the local industries and organizations such that they grow and flourish together, mutually supporting the continual growth and development of both the parties. The curricula of an entrepreneurial university shall reflect the concerns of the local economy within the broader framework of a globalized economy. Similarly, the local industries and organizations shall support the formation of the learners at the respective universities, by providing them with every kind of support and opportunities for their entrepreneurial development.

At the same time, the formation given at an entrepreneurial university shall not be confined to the concerns of local economy alone; rather it shall provide a context to understand the intricacies of the globalized life and workspaces. Each learner shall preserve the right to liberal education, whereby s/he is not trained to a particular job, rather is trained towards an autonomous conduct of life with a broader perspective that fully develop his/her individual uniqueness. Here, education serves the purpose of the realization of the potentials of an individual person as a unique contributor to the welfare of the world.

### Emergence of Entrepreneurial Pedagogy

Liberal formation of new generation learners in a VUCA-driven world shall be ensured by developing a new style of imparting education that promotes autonomous, lifelong, venturesome, and flexible learning as required by a VUCA world. At the same time the learners shall also enjoy the parental, family, or societal acceptance for such an entrepreneurial paradigm shift, an intergenerational approach shall be adopted in the conduct of education. Such a method of the conduct of education shall be complemented with an entrepreneurial pedagogy. Rajagiri Media has authored and copyrighted such a pedagogy called Pallikkutam pedagogy for Entrepreneurial Education as part of its mission to make entrepreneurial education universal, which carries significance for both school level and higher education. Let us join hands to ring in an entrepreneurial paradigm shift in the conduct of education in India!

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# Teaching-learning Experiences in Higher Education Institutions during COVID-19 Pandemic: A Case Study

D Raja Jebasingh\* and Ancy Antony\*\*

Higher Education has proved to be the major tool for socio-economic transformation of any nation. The quality of education depends on several factors like Curriculum Framework, Effective Teaching-learning Process, pedagogy, evaluation system, infrastructure facilities etc. COVID-19 Pandemic has disrupted most of the industries in the world. The COVID-19 pandemic has affected and disrupted all sectors and walks of life globally. Higher education sector are also severely impacted due to the pandemic. The sudden closer of face to face teaching –learning and other academic/research related activities in the campus has enormously disturbed the routine academic planning of students and faculty members. The traditional (Chalk and Talk) teaching –learning pedagogy methodologies and student –teacher on campus interactions has been replaced with online education.

This new normal scenario has paved the way for online education and virtual classroom to connecting the student –teacher across the continent with minimal challenges of digital divide. As per the UNESCO report, As of March 30, over 166 countries have implemented nationwide closures, impacting over 87 per cent of world’s student population, 1.52 billion students. In addition, nearly 60.2 million teachers are no longer in the classroom. UGC have been emphasizing to continue with the teaching-learning process using online modes such as Google Classroom, Google Hangout, Cisco Webex Meeting, You Tube Streaming, OERs, SWAYAM Platform and

Swayamprabha (available on Doordarshan (Free dish) and Dish TV), etc. The emergence of the recent pandemic condition fundamentally altered the manner in which instruction is provided and, ultimately, pedagogical methodology. The distribution of material, communication, assessment,

\* Vice Principal and Research Guide, St. Joseph’s College of Commerce (Autonomous) Bengaluru. E-mail: rajajebasingh@sjcc.edu.in

\*\* Freelance and Active Researcher Based in Patna, Bihar. E-mail: Ancyantony@gmail.com.

and feedback all shifted to the available internet channels. This prompted educators to re-imagine the entire teaching-learning process and to embrace ICT tools and technologies as the chariots of contemporary education.

The COVID-19 epidemic has sparked a global surge of online learning and teaching among educators. The education sector’s technology advancements, combined with the current epidemic crisis, have displaced the traditional offline form of instruction in favour of ICT-based techniques. However, the sudden shift from traditional teaching and learning to virtual /online education compels the HEIs to measure the effectiveness of remote learning as well as to prepare the institutions to face the new normal. The pandemic has compelled the global academic community to look at new methods of teaching and learning, such as distance and online learning. This has been tough for both students and professors, who must deal with the emotional, physical, and financial challenges caused by the sickness while also doing their best to help stop the spread of the virus. At, this juncture there is an urgent need to self-examine the teaching –learning approaches (Pedagogy), assessment and evaluation methodologies and educational experience for students and attitude change among the faculty members.

## COVID-19 Impact on Education: Higher Education

The education sector has not been spared either. Schools, colleges, and universities have undergone a series of shutdowns and reopening. Institutions of higher learning have been forced to adapt to remote and online learning utilizing the emergence of new forms of learning technologies. Thus, learning in the 21st century is experiencing rapid changes that have been witnessed in the rise of the COVID-19 Pandemic and the technological advancement in the age of globalization. Education is the only industry that is completely transferred to online mode in most countries around the world. ICT has become vital in almost all aspect of human life. Accelerated



innovations in ICT are giving rise to new learning technologies which are deciding the rate of learning in Higher Education Institutions (HEIs).

According to UNESCO, on 1<sup>st</sup> April, 2020, schools and Higher Education Institutions were closed in 185 countries, affecting 1 542 412 000 learners, which constitute 89.4 per cent of total enrolled learners. At the beginning of May, some countries, experiencing decreasing numbers of cases and deaths, started lifting confinement measures. As on 7 May, 2021, Schools and Higher Education Institutions were still closed in 177 countries, affecting 1 268 164 088 learners, which constitute 72.4 per cent of total enrolled learners.

The Table-1 clearly shows that the percentage of HEIs at which teaching has been cancelled is very low in all regions except in Africa, where it is currently reported to be at 24 per cent. Africa is also the only region where teaching has been suspended or cancelled at the majority of Higher Education Institutions. Only 29 per cent of African HEIs were able to quickly move teaching and learning online, compared to 85 per cent of HEIs in Europe. Two-thirds of African HEIs were not prepared to move teaching online and when they closed their campuses they had to suspend teaching.

### Higher Education: The Present Scenario in India

India's Higher Education has given some of the world's best talents. India is the 3<sup>rd</sup> largest in the world, next to China and United States in terms of student's enrollment and India the 2<sup>nd</sup> largest education system in the world. The landscape of higher education has changed over the past decade from 436 Universities in 2009-10 to 1043 Universities, 42343 Colleges and 11779 Stand Alone Institutions. Total

enrolment in higher education has been estimated to be 38.5 million with 19.6 million boys and 18.9 million females. Female constitute 49 per cent of the total enrolment. The Gross Enrolment Ratio (GER) in Higher Education in India is 27.1, which is calculated for 18-23 years of age group. GER for male population is 26.9 and for female, it is 27.3. Student enrolment grows by 11.4 per cent from 2015-16 to 2019-20. (All India Survey on Higher Education (AISHE) 2019-20 Report) For the first time India is among the 50 Countries with rank of 48 in the Global Innovation index, India stood at 81<sup>st</sup> position in the year 2015. Even in the employability rankings 2020, India has improved its ranking from 23 in 2010 to 15 in 2020 even developed countries like UK and USA Universities showed a decline.

### Review of Literature

The purpose of this article is to discuss the major effects of COVID-19 on HEIs in India. To obtain data for the current study, researchers looked through various studies on the COVID-19 epidemic conducted by national and international institutions. Due to the lockout, data on the influence of COVID-19 on India's higher educational system are acquired from a wide number of respectable websites, journals, and electronic publications. Throughout the crisis, HEIs and educational authorities in India implemented a number of steps to ensure the continuity of educational services, which have finally been resolved. The most recent epidemic sparked a paradigm shift in educational techniques and the widespread adoption of immersive instruction at all levels of education. To ensure adequate service, all service providers must be deployed. Additionally, vulnerable groups of people may be linked to educational support networks. Due to the onset of COVID-19, digital education is the most prevalent

**Table-1: Impact on Teaching and Learning by Region**

Region	Not affected	Classroom Teaching Replaced by Distance Teaching and Learning	Teaching Suspended but the Institutions is Developing Solutions	Teaching cancelled
Africa	3 per cent	29 per cent	43 per cent	24 per cent
Americas	3 per cent	72 per cent	22 per cent	3 per cent
Asia & Pacific	1 per cent	60 per cent	36 per cent	3 per cent
Europe	Almost zero	85 per cent	12 per cent	3 per cent

Source: IAU – COVID-19 Global Impact Survey 2020 (<https://www.iau-aiu.net/IAU-Global-Survey-on-the-Impact-of-COVID-19-on-Higher-Education-around-the>)

style of education during this time of crisis. According to covid-19, education is typically centred on widely accepted online/virtual education, which may or may not be a parallel type of education. This report does not provide a statistical analysis of COVID-19's effect on higher education; nevertheless, a more in-depth review including statistical analysis might be conducted (Jena, 2020).

This article will explore the significant implications of COVID-19 on HEIs in India. To gather data for this study, researchers combed through a variety of national and international studies on the COVID-19 outbreak. Due to the lockout, data on COVID-19's impact on India's higher educational system are gathered from a variety of reputable websites, journals, and electronic publications. Throughout the crisis, higher education institutions and educational authorities in India took a variety of initiatives to assure the continuity of educational services, which have now been resolved. The most recent outbreak prompted a paradigm shift in educational practises and the widespread use of immersive training across all levels of school. All service providers must be deployed to ensure proper service. Additionally, educational support networks may be established for disadvantaged groups of people. As a result of the outbreak of COVID-19, digital education has become the most frequent mode of instruction during this period of crisis. According to COVID-19, education is typically centred on widely accepted online/virtual education, which may or may not be a substitute for traditional education. Although this research does not include a statistical analysis of COVID-19's impact on higher education, a more in-depth review with statistical analysis might be undertaken (Mishra, 2020).

The purpose of this study was to observe how Commerce postgraduate coursework students in a college at a prominent South African university transitioned rapidly from entirely face-to-face instruction to entirely online instruction. This study obtained data via an online questionnaire. According to the findings, these students perceive no distinction between their academic, personal, and professional lives. They struggled with time management, and their academic pursuits were harmed by anxieties about future employment and financial concerns regarding staff. In terms of encouragement, lecturers and course administrators play a significant role in online learning. (Singh, 2020)

The study examines students' attitudes about e-learning during the COVID-19 pandemic. This study adopts a quantitative method, collecting responses using an online questionnaire from 184 university students at Delhi University, Jamia Millia Islamia (Central University), and Guru Gobind Singh Indraprastha University in Delhi, India's National Capital Territory (NCT). Between June and August of 2020, this research study was conducted. The study's findings indicate that students have an optimistic attitude toward e-learning and, as a result, embrace this modern way of instruction. Additionally, it has emphasised the relevance of e-learning in light of the COVID-19 issue. In actuality, e-learning has arisen as a novel method of increasing the learning process, with social media having the potential to further enhance learning performance. (Khan, 2020)

### **Digital Learning Resources (DLRs)**

Digital Learning Resource refers to materials included in the context of a course that supports the learner's achievement of the described learning goals. With the development of ICT in education, digital learning resources (DLRs) within higher education include not only various types of multimedia materials but also well-designed course activities such as Massive Open Online Courses (MOOCs), e-content, Online Courses (OCs), or online video micro-courses. These DLRs are making learning more flexible, accessible and contextualized. However, HEIs essentially should evaluate how to select appropriate digital learning resources for learners who are participating in online learning activities and also good to monitor the system regularly.

### **Technology Enabled Learning Resources (TELRS) Initiatives in Indian Higher Education**

Many digital learning tools have been developed throughout through Ministry of Education Government of India such as MOOCs, OER, policies, toolkits, and online learning guidelines. The available materials might help students learn during the campus closure. The various e-learning platforms of the Ministry of Education (MoE) have seen an unprecedented combined access of over 1.4 crore since 23<sup>rd</sup> March, 2020. The National Online Education Platform SWAYAM has been accessed nearly 2.5 lakh times. This is in addition to about 26 lakh learners already enrolled in the 574 courses available on the SWAYAM platform.

In recent times, the Higher Education Department of Ministry of Education, Government of India has launched several new innovative initiatives / programs to make higher education more pervasive and effective and usher in significant positive changes in Higher education sector. The below table provides a detailed overview of accessible digital learning materials that teachers and students can use in their respective teaching and learning situations.

The purpose of this paper to study the perceptions of students on teaching and learning experiences during the COVID-19 pandemic. The data was collected at the Undergraduate, Postgraduate level students and Doctoral Research Scholars studying in Higher Education Institutions (HEIs) at Bengaluru. The data was collected during the final semester examinations of 2021. The study is descriptive in nature. A qualitative survey was used to examine the online teaching and learning experiences of students from undergraduate and postgraduate during COVID-19 pandemic.

A sample of 145 students from Bangalore City University affiliated colleges was selected by using Non Probability - Sampling technique. The sample comprised 145 students: 67 male and 78 female students. In order to collect data on teaching and learning experience in the region, a survey was designed that basically contained questions about each of these different topics. The survey was administered via emails and social networking sites and Apps, processed between the end of April and the end of May. The sample is representative of Bengaluru region, but was not designed to be equally representative of each of the district, so comparisons between them should be avoided or, at best, considered merely indicative.

The data collected was collected from both primary and secondary sources. For the primary data collection, an online survey-based questionnaire was designed and circulated among the students. The survey-based questionnaire contains 30 multiple questions (yes/no, multiple-choice, and open-ended questions), which covered the study's objectives. It was designed through Google forms and sent to participants through. The secondary data has been gathered from various sources (a) Journals, Scholarly Articles, (b) Research papers, (c) Reports from official websites of UGC, NAAC, and Ministry of Education Government of India.

The data was analyzed and interpreted using SPSS software .The analysis and testing of hypothesis was done through: Chi-square tests- It is a one way to demonstrate a relationship between two categorical variables is to use a chi-square statistic. Numerical (countable) variables and non-numerical (categorical) variables are the two types of variables in statistics. Regression test- It is a method of testing that is used to ensure that a software update does not affect the product's current functionality. This is to ensure that the product functions properly for any new functionality, bug fixes, or changes to existing features. In order to check the effect of transition, previously executed test cases are re-executed.

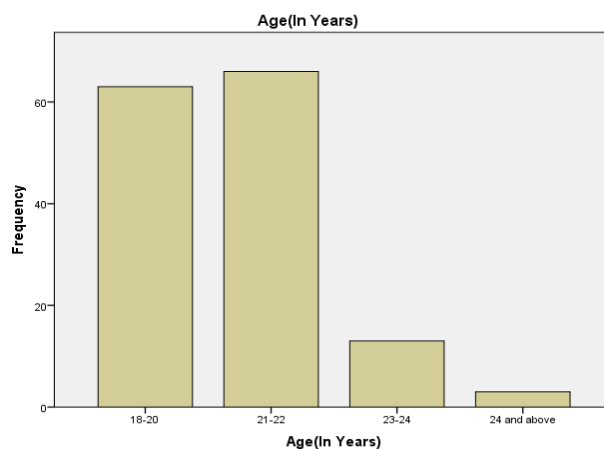
## Results and Discussions

**Table -3: Age of the Respondents**

Age in Years (Range)	Frequency	Percent
18-20	63	43.4
21-22	66	45.5
23-24	13	9.0
24 and above	3	2.1
<b>Total</b>	<b>145</b>	<b>100.0</b>

Source: Compiled from primary data

**Figure -1: Age Category and its Frequency**



The age of the respondents is shown in table 3 above. The years have been divided into four categories. The majority of the responders are between the ages of 18 and 20, as well as 21 and 22. Almost 85 per cent of the population falls under this category. Figure 1 depicts the age category and its frequency in numerical terms.

**Table -4 : Gender of the Respondents**

Gender	Frequency	Percent
Male	67	46.2
Female	78	53.8
<b>Total</b>	<b>145</b>	<b>100.0</b>

Source: Compiled from primary data

**Figure-2**

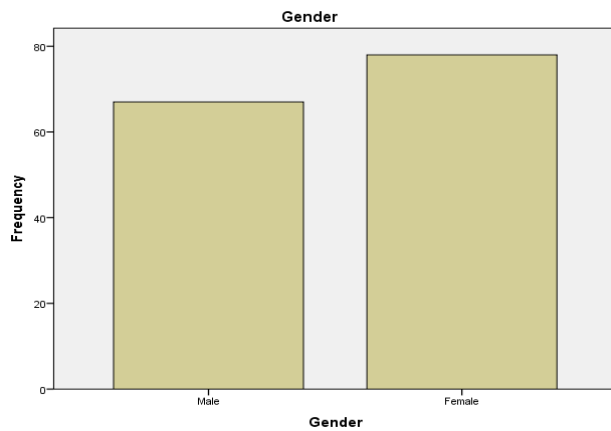


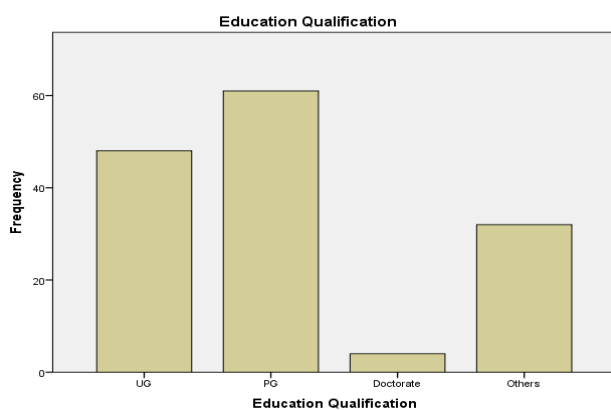
Table-4 exhibits that the gender of the respondents. The majority of the respondents are female 53.8 per cent and male respondents 46.2 per cent. Figure-2, portrays the category of gender and its frequency in terms of numbers.

**Table -5 : Educational Qualification of the Respondents**

Gender	Frequency	Percent
UG	48	33.1
PG	61	42.1
Others	32	22.1
Doctorate	4	2.8
<b>Total</b>	<b>145</b>	<b>100.0</b>

Source: Computed from Primary Data

**Figure-3**



The educational qualifications of the respondents are shown in Table-5. The majority of responders (42.1 percent) are Post Graduates, followed by Undergraduates (33.1 percent). Doctorate and other degrees are combined at 25 per cent. Figure-3 depicts the type of educational qualification (pursuing) as well as its numerical frequency.

**Table-6 : Age (In Cross Tabulation Years)\*  
The Biggest Obstacles during Online Learning:  
[Lack of Internet Access]**

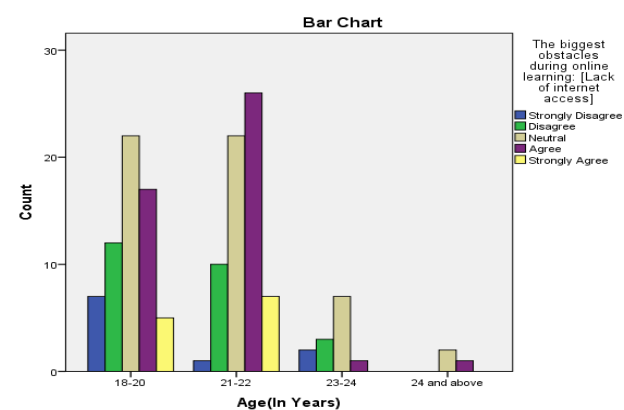
Age (In Years)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
18-20	7	12	22	17	5	63
21-22	1	10	22	26	7	66
23-24	2	3	7	1	0	13
24 and above	0	0	2	1	0	3
<b>Total</b>	<b>10</b>	<b>25</b>	<b>53</b>	<b>45</b>	<b>12</b>	<b>145</b>

Source: Computed from Primary Data

The cross tabulation on Age (In Years) and the major hurdles during online learning is shown in Table 6, the age groups of 18 to 20 and 21 to 22 were polled on whether they strongly agreed or disagreed with the proposed statement that a lack of internet connectivity would be the most significant stumbling block to online learning.

When it comes to internet access barriers, the majority of respondents take a neutral stance. With over 57 percent of respondents agreeing or strongly agreeing, we may conclude that a lack of internet connectivity is the most significant stumbling block to online learning. The stance of the proposed statement as opined by the various age groups is depicted in Figure 4.

**Figure-4**

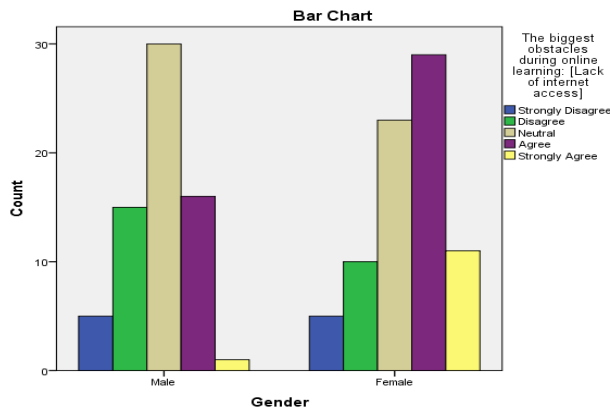


**Table-7 : Cross Tabulation Gender\* the Biggest Obstacles during Online Learning: [Lack of Internet Access]**

Gender	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Male	5	15	30	16	1	67
Female	5	10	23	29	11	78
<b>Total</b>	10	25	53	45	12	145

Source: Computed from Primary Data

**Figure-5**



The Table-7 exhibits that the cross tabulation on Gender and the biggest obstacles during online learning: [Lack of internet access] of the respondents. When it comes to internet access barriers, the majority of respondents take a neutral stance. With over 57 percent of respondents agreeing that lack of internet access is the most significant stumbling block to online learning, we may conclude that lack of internet connection is the most significant stumbling block. Only one out of 67 males in the male group strongly disagreed with the suggested statement. Figure 4 depicts the gender category's position on the proposed statement.

**Table - 8: Cross Tabulation - Gender \* the Biggest Obstacles during Online Learning: [Electronic Gadgets]**

Gender	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Male	4	18	27	14	4	67
Female	12	21	18	19	8	78
<b>Total</b>	16	39	45	33	12	145

Source: Computed from Primary Data

**Figure-6**

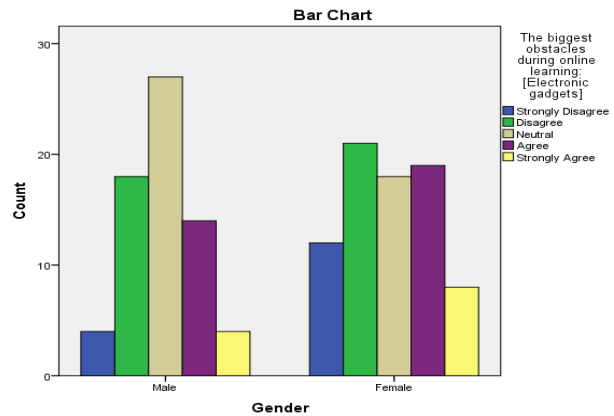


Table-8 exhibits that the cross tabulation on Gender and the biggest obstacles during online learning: [Electronic Gadgets] of the respondents. When it comes to difficulties in terms of a lack of electronic equipment, the majority of respondents are in a neutral position. We may deduce that the lack of electronic gadgets would be the biggest causing difficulty during online learning based on the majority of respondents who agreed and strongly agreed. Only one out of every 55 men in the male category strongly disagrees with the suggested statement. Figure 6 depicts the gender category's position on the proposed statement.

**Table – 9: Chi square Test on Age Group Mode of Learning**

	Value	Df	Asymp. Sig. (2-sided)	Monte Carlo Sig. (2-sided)	
				Sig	95 per cent Confidence Interval
					Lower Bound
Pearson Chi-Square	13.782a	3	.003	.002b	.001
Likelihood Ratio	12.969	3	.005	.006b	.004
Fisher's Exact Test	12.851			.003b	.002
Linear-by-Linear Association	2.381c	1	.123	.138b	.132

Source: Computed from Primary Data

The p value is 0.05, so if the value is less than 0.05, we reject null hypothesis and accept the alternative hypothesis. If the p value is more than 0.05, we accept the null hypothesis and reject alternative hypothesis. In Table 1, the significance value is 0.003 which is smaller than 0.05, hence we accept alternative hypothesis and reject the null hypothesis.

The p value is 0.05, so if the value is less than 0.05, we reject null hypothesis and accept the alternative hypothesis. If the p value is more than 0.05, we accept the null hypothesis and reject alternative hypothesis. In Table 1, the significance value is 0.166 which is greater than 0.05, hence we accept alternative hypothesis and reject the alternative null hypothesis.

**Interpretation**

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + \dots + b_nx_n$$

Overall satisfaction you derive on online learning= 3.076 + .108 (Good internet connection)+ .068 (Digital group assignments)

H<sub>0</sub> – There is no association between level of satisfaction and overall satisfaction you derive on online learning.

H<sub>1</sub> - There is association between level of satisfaction and overall satisfaction you derive on online learning.

Since the p value of Good internet connection and Digital group assignments is .080 and .230 which is greater than .050, there is sufficient evidence to accept the null hypothesis. It is inferred that there is no association between Good internet connection and Digital group assignments and Overall satisfaction you derive on online learning. Good internet connection and Digital group assignments have failed to exert sufficient influence on the overall satisfaction derive on online learning.

**Conclusion**

To conclude, the recent crises derived from the COVID-19 pandemic have provoked major effects on education systems world-wide, including higher education. Learning opportunities have been significantly disrupted in most countries, particularly for disadvantaged populations. The pandemic prompted pedagogical changes and the use of immersive teaching at all levels. This will need improving the service platform to match student demand. Access to educational platforms must be made available to all service providers. Due to the spread of COVID-19, digital education

**Table -10: Chi square Test on Gender Application Used for Online Platform**

	Value	Df	Asymp. Sig. (2-sided)	Monte Carlo Sig. (2-sided)	
				Sig.	95 per cent Confidence Interval
					Lower Bound
Pearson Chi-Square	12.929 <sup>a</sup>	9	.166	.141 <sup>b</sup>	.134
Likelihood Ratio	15.026	9	.090	.158 <sup>b</sup>	.150
Fisher's Exact Test	12.118			.151 <sup>b</sup>	.144
Linear-by-Linear Association	.937 <sup>c</sup>	1	.333	.345 <sup>b</sup>	.336

Source: Computed from Primary Data

**Table – 11: Regression Test Level of Satisfaction on Online Learning**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.076	.230		13.371	.000
	X15	.108	.061	.149	1.765	.080
	X16	.068	.056	.102	1.205	.230

Source: Computed from Primary Data

is the most frequent style of education. However, as a consequence of the outbreak, its need of the hour that HEIs and students should collaborate closely work towards to discover new and innovative solutions to have better learning opportunities. Also, outcome of this research urge that the funding agencies would offer financial assistance to HEIs to augment institutions infrastructure in order to conduct virtual teaching and learning activities. The COVID-19 pandemic compels the Higher Education Institution (HEIs) and stakeholders for remote learning. In this sense, the pandemic is also a call to HEIs renew the educational measures for teaching-learning, Assessment and Evaluation commitment to the Sustainable Development Goals.

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(contd. on pg. 27)

# Global Research Productivity in Jainism during 2010-2020

Sunil Tyagi\*

Jainism is one of the ancient surviving religious traditions of the world, with at least 2500 or 3000 years of more or less recorded history and with infinite aeons of other history, nowadays, usually termed '*mythical*'. Originally, the members of the community were known as '*nirgranthas*' (bondless ones), a label which reflects the ascetic nature of religion. The historical and mythical leaders of this religion were called '*tirthankaras*' (ford makers) (Paniker, 2010).

Jainism projects itself globally as remedies to the world problems and for all. The main offering to modern global society in refashioned form of the Jain ethics are *ahimsā* (non-violence) and *aparigraha* (non-possession) promoted by a philosophy of *anekāntavāda* (non-one-sidedness). Jainism had been framed not only as a religion, in the sense of the '*Religionswissenschaft*' (Science of Religion), but also as a global religion by colonial administrators and by Western-educated Jain community leaders towards promoting the reformist agenda that dominated Jain culture, especially in the global Jain Diaspora (Flügel, 2012).

Flügel, 2012 opined that the emerging global Jain Diaspora fashioned modern lay associations and charities reflecting traditional divisions and contributed to growth by:

- Global mass communication and transportation;
- Commercial interests and networks globally;
- Worldwide Jain missions (sectarian and trans-sectarian);
- Desire of the Jain elites to secure recognition, rights, and privileges for their community;
- Growing interest in Jain way of life, and philosophical pluralism.

The perceived significance of understanding of the Jainism religious tradition and its influence has been currently reflected across the world in a plethora of curricula of universities or institutions, therefore, to study the Jainism, the available resources are

diverse and plentiful. Over the past 11 years, there has been a remarkable growth in the literature on Jainism, therefore, in light of its increasing relevance, it is essential to evaluate this production. However, to the author knowledge, no scientometric analysis of Jainism at global level has been executed so far. Therefore, the present study has tried to bridge the research gap and studies the collaborative networks using the knowledge mapping techniques.

## Research Design

### Objectives

The study seeks to examine the global research productivity on 'Jainism' as indexed in SCOPUS collection database during the period 2010-2020. The study looks at annual publications growth on the topic, author productivity, its distribution by document and source type, as well as its global publications share. The study also seeks to analyse the leading countries, organisations and top prolific authors and journals in publishing research on the topic.

### Material and Methodology

In the current study, Scopus database was scanned to accomplish the objective of the study. Total 211 documents were retrieved suitable for the study through the search string (TITLE-ABS-KEY (Jainism) for the period 2010-2020. The date of the retrieval was 1<sup>st</sup> June, 2021. The global search output was subsequently analysed using the analytical provisions available in the Scopus database. Data in the retrieved document was exported to Microsoft Excel for further analysis. The exported data included annual growth of publications, documents type, languages, discipline, countries, authors, institutions, journals, citations, and funding agencies. The retrieved document was also exported to VOSviewer program for creating network visualization maps.

### Bibliometrics indicator used

Author has used two bibliometric indicators in the present study. These are total number of papers (TNP) and total number of citations (TNC) for measuring the scientific research output and impact.

\* Assistant Librarian, Jain Vishva Bharati Institute (Deemed University), Ladnun- 341306 (Rajasthan)



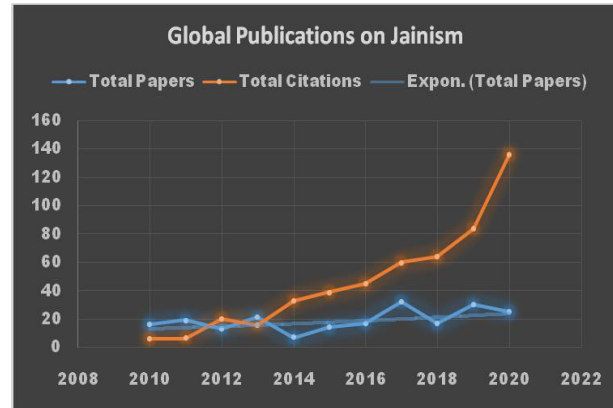
Besides these bibliometric indicators, two relative indicators citations per paper (CPP) and relative citation impact (RCI) have also been used. Various scientometric parameters have also been applied such as authors' productivity and explored statistical techniques for the present study.

## Analysis and Results

### Global Research Output on Jainism

Over the past years, there has been recorded a tremendous growth in the literature on Jainism. The global research output on Jainism consisted two hundred eleven ( $n=211$ ) publications in 11 years during the period 2010-2020 with an average of 19.18 publications per year. A global research output was published with an annual average growth rate of 18.61 per cent and 4.14 per cent compound average growth rate (CAGR). The impact of research output can be measured with the citation received and pertaining to this, the global research on Jainism have registered five hundred ten ( $n=510$ ) total citations with an average 2.53 citations per paper during the period. The highest annual output was 15.16 per cent ( $n=32$ ) in 2017 and lowest 3.32 per cent ( $n=7$ ) in year 2014 (Figure 1; Table 1).

**Figure-1: Global Research Publication Growth on Jainism (2010-2020)**



### Relative growth rate and doubling time of Jainism publications

Relative Growth Rate (RGR) is a measure to study the increase in the number of publications per unit of time and Doubling Time (DT) represents the time required for publications to become double the existing number. The RGR and DT are calculated using the following equations:

$$\text{Relative Growth Rate (RGR)} = \ln N_2 - \ln N_1 / t_2 - t_1$$

$$\text{Doubling Time (DT)} = \ln 2 / \text{RGR}$$

**Table-1: Global Research Output on Jainism (2010-2020)**

Publication year	TNP	%TNP	TNC	%TNC	CPP
2010	16	7.58	6	1.18	0.38
2011	19	9.01	7	1.37	0.37
2012	13	6.16	20	3.92	2.31
2013	21	9.95	16	3.14	0.76
2014	7	3.32	33	6.47	4.71
2015	14	6.63	39	7.65	2.79
2016	17	8.06	45	8.82	2.65
2017	32	15.16	60	11.76	1.88
2018	17	8.06	64	12.55	3.76
2019	30	14.22	84	16.47	2.8
2020	25	11.85	136	26.67	5.44
<b>Global Output</b>	<b>211</b>	<b>100</b>	<b>510</b>	<b>100</b>	<b>2.53</b>
<b>Mean</b>	<b>19.18</b>		<b>46.36</b>		
<b>Standard Deviation</b>	<b>7.43</b>		<b>38.70</b>		
<b>AGR</b>	<b>18.61</b>	<b>CAGR</b>	<b>4.14</b>		

\*Note: TNP=Total Number of Papers; TNC=Total Number of Citations; CPP=Citations Per Paper; RCI=Relative Citation Impact; AGR=Average Growth Rate; CAGR= Compound Average Growth Rate

Where, N2 and N1 are the cumulative numbers of publications in the year t2 and t1 respectively.

The RGR of the world's Jainism publication output decreases gradually from 0.79 to 0.10. On the other hand, DT indicates an increasing trend from 0.88 in 2011 to 6.93 in 2014. The mean average RGR of Jainism literature is 0.24 and DT is 3.51 (Table 2).

#### Authors' Productivity in Jainism

Resultant data on authors' productivity and average author per paper on Jainism are depicted in Table-3. It has been inferred from the data that the total average number of authors per paper was 1.27

and the average productivity per author was 0.79. The highest number of author's productivity 32 (0.86) was registered in 2017 (Table 3).

#### Correlation between Number of papers and Number of Authors

Pearson correlation analysis was applied to evaluate the correlation between number of papers and the number of authors. The resultant data inferred significant and positive relationship ( $r = 0.960$ ,  $N = 11$ ,  $p = 0.000$ ). As the p-value is  $< 0.05$ , therefore, it is highly significant. It means that the higher numbers of co-authors were contributed to the higher number of papers (Table 4).

**Table-2: Relative Growth Rate and Doubling time of Publications**

Publication Year	TNP	Cumulative	Natural Log	RGR	DT
2010	16	16	2.77	--	--
2011	19	35	3.56	0.79	0.88
2012	13	48	3.87	0.31	2.23
2013	21	69	4.23	0.36	1.92
2014	7	76	4.33	0.10	6.93
2015	14	90	4.49	0.16	4.33
2016	17	107	4.67	0.18	3.85
2017	32	139	4.94	0.27	2.57
2018	17	156	5.05	0.11	6.31
2019	30	186	5.23	0.18	3.85
2020	25	211	5.35	0.12	5.78
<b>Global Output</b>	<b>211</b>	--	--	--	--
<b>Mean</b>	<b>19.18</b>	--	--	<b>0.24</b>	<b>3.51</b>

\*Note: TNP=Total Number of Papers; RGR=Relative Growth Rate; DT=Doubling Time

**Table-3: Authors' Productivity in Jainism Global Research (2010-2020)**

Publication year	Total Paper	Total Author	Average Author Per Paper	Productivity Per Author
2010	16	18	1.13	0.89
2011	19	23	1.21	0.83
2012	13	14	1.08	0.93
2013	21	30	1.43	0.70
2014	7	8	1.14	0.86
2015	14	20	1.42	0.70
2016	17	22	1.29	0.77
2017	32	37	1.16	0.86
2018	17	21	1.24	0.81
2019	30	44	1.47	0.68
2020	25	37	1.48	0.68
<b>Global Output</b>	<b>211</b>	<b>274</b>	<b>14.05</b>	<b>8.71</b>
<b>Mean</b>	<b>19.18</b>	<b>24.91</b>	<b>1.27</b>	<b>0.79</b>
<b>Standard Deviation</b>	<b>7.43</b>	<b>10.89</b>		

**Table-4: Correlation between Number of Papers and Number of Authors**

		Number of Papers	Number of Authors
	Pearson Correlation	1	0.960
Number of Papers	Sig. (2-Tailed)		0.000
	N	11	11
	Pearson Correlation	0.960	
Number of Authors	Sig. (2-Tailed)	0.000	
	N	11	11

\*Correlation is significant at the 0.01 level

#### Access Category of Research on Web

The publication venues Open Access (OA) enables the research community to easily understand and to get an overview of the publication category bound to the Gold, Green and Bronze OA (open access). It revealed that out of total 211 research publications, 57.82 per cent ( $n=122$ ) documents have been published under different categories of open access (all open, gold, hybrid gold, bronze and green), whereas, 42.18 per cent ( $n=89$ ) publications were published under the different other access category (Table 5).

**Table-5: Access Category of Global Research on Jainism (2010-2020)**

Access category	TNP	%TNP
All Open access	52	24.65
Gold access	28	13.27
Hybrid Gold access	3	1.42
Bronze access	12	5.69
Green access	27	12.79
Other access	89	42.18
<b>Global Output</b>	<b>211</b>	<b>100</b>

\*Note: TNP=Total Number of Papers

#### Types of Documents

The study presents the types of documents that published during the period from 2010-2020 on Jainism. Of the total 211 research publications, the 47.87 per cent ( $n=101$ ) appeared as articles, 28.91 per cent ( $n=61$ ) as book chapter, 12.32 per cent ( $n=26$ ) as review, 8.53 per cent ( $n=18$ ) as book, 1.43

per cent ( $n=3$ ) as conference paper, and 0.47 per cent ( $n=1$ ) each as editorial and short survey respectively (Table 6).

**Table-6: Types of documents on Jainism Related Research (2010-2020)**

Document types	TNP	Cumulative	%TNP
Article	101	101	47.87
Book Chapter	61	162	28.91
Review	26	188	12.32
Book	18	206	8.53
Conference Paper	3	209	1.43
Editorial	1	210	0.47
Short Survey	1	211	0.47
<b>Global Output</b>	<b>211</b>		<b>100</b>

\*Note: TNP=Total Number of Papers

#### Language of Documents

The study also presents the languages of documents that published during the period from 2010-2020. Of the total 211 research publications, majority of documents 95.27 per cent ( $n=201$ ) appeared in English language, 2.37 per cent ( $n=6$ ) in Russian, 0.95 per cent ( $n=2$ ) in Lithuanian. Whereas, 0.47 per cent ( $n=1$ ) documents each in Czech, French and German languages appeared respectively (Table 7).

**Table-7: Language of Documents on Jainism Related Research (2010-2020)**

Languages of documents	TNP	Cumulative	%TNP
English	200	200	94.79
Russian	6	206	2.85
Lithuanian	2	208	0.95
Czech	1	209	0.47
French	1	210	0.47
German	1	211	0.47
<b>Global Output</b>	<b>211</b>		<b>100</b>

\*Note: TNP=Total Number of Papers

#### Top Prolific Authors in Jainism

The top ten productivity authors based on publications and citations in the studied research domain is represented in Table-8. Two hundred seventy-four ( $n=274$ ) authors participated unevenly in 211 global research publications on Jainism.

The top ten author's productivity varied from 2≥6 research publications per author. Their combined output shared 16.57 per cent (n=35) global research publication and 11.36 per cent (n=58) global citations during 2010-2020. Valley with 2.84 per cent (6 papers, 6 citations) topped the most productive author followed by Chapple with 2.37 per cent (5 papers, 5 citations), and Donaldson with 1.89 per cent (4 papers, 0 citations) respectively. Authors having lower value of relative citation impact (RCI<1) imply that the productivity output was not proportional with their impact. The scientometric mapping of authors indicates the weak collaborative pattern (Figure 2; Table 8).

### Active Countries in Jainism

Thirty-one (n=31) countries participated unevenly in 211 global research publications on Jainism. The top ten countries' share ranging 2≥80 documents during the study period. Their combined output shared 86.27 per cent (n=182) global research publication and 96.67 per cent (n=493) global citations. It evident from analysis that in publishing research in Jainism was dominated by USA with 37.92 per cent (n=80 documents; n=336 citations) followed by India with 24.65 per cent (n=52 papers; n=70 citations) and UK with 8.06 per cent (n=17 papers; n=41 citations) respectively. The resultant data showed that the 22 countries published 1≥2

**Figure-2: Network visualization mapping of co-authorship pattern on Jainism related research (the map was created by VOSviewer)**



papers, whereas, 5 countries published 3≥8 papers respectively. The countries having low value of relative citation impact (RCI<1) implies that the research output was not commensurate with their impact. Mapping research collaboration in the Jainism-related literature for the top 10 countries yielded 7 clusters with 4 links and total link strength (TLS) of 7 (Figure 3; Table 9).

**Table-8: Top Ten Prolific Authors in Publishing Jainism Related Research (2010-2020)**

Active authors	TNP	%TNP	TNC	%TNC	CPP	RCI	Rank
Valley A.	6	2.84	6	1.18	1.00	0.41	1
Chapple C.K.	5	2.37	5	0.98	1.00	0.41	2
Donaldson B.	4	1.89	0	0	0.00	0	3
Bronkhorst J.	3	1.42	22	4.31	7.33	3.04	4
Aukland K.	3	1.42	4	0.78	1.33	0.55	5
Bhat P.R.	3	1.42	0	0	0.00	0	6
Granoff P.	3	1.42	4	0.78	1.33	0.55	7
Long J.D.	3	1.42	1	0.19	0.33	0.14	8
Sethi M.	3	1.42	2	0.39	0.67	0.28	9
Appleton N.	2	0.95	14	2.75	7.00	2.89	10
<b>Share of top 10 Authors</b>	<b>35</b>	<b>16.57</b>	<b>58</b>	<b>11.36</b>	<b>1.66</b>	<b>0.69</b>	
<b>Global Output</b>	<b>211</b>	<b>100</b>	<b>510</b>	<b>100</b>	<b>2.53</b>	<b>1</b>	

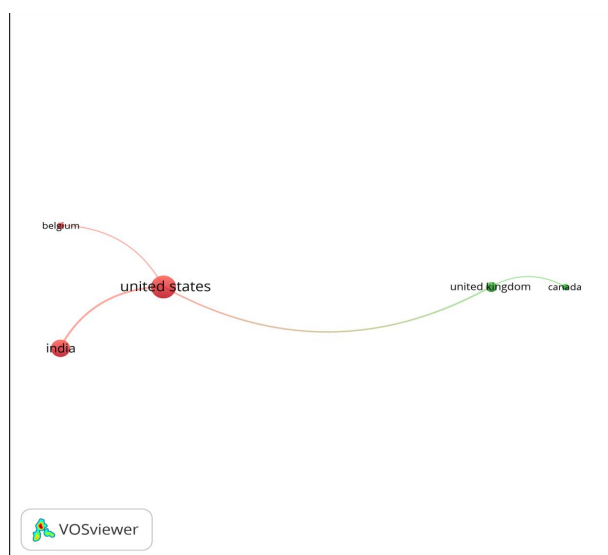
\*Note: TNP=Total Number of Papers; TNC=Total Number of Citations; CPP=Citations Per Paper; RCI=Relative Citation Impact

**Table-9: Top Ten Active Countries in Publishing Jainism Related Research (2010-2020)**

Active Countries	TNP	%TNP	TNC	%TNC	CPP	RCI	Rank
United States of America (USA)	80	37.92	336	65.88	4.2	1.74	1
India	52	24.65	70	13.72	1.35	0.56	2
United Kingdom	17	8.06	41	8.04	2.41	0.99	3
Russian Federation	8	3.79	6	1.18	0.75	0.31	4
Belgium	7	3.32	7	1.37	1.00	0.41	5
Canada	7	3.32	8	1.57	1.14	0.47	6
Switzerland	4	1.89	23	4.51	5.75	2.39	7
Germany	3	1.42	2	0.39	0.67	0.28	8
Australia	2	0.95	0	0	0.00	0	9
China	2	0.95	0	0	0.00	0	10
<b>Share of top 10 Countries</b>	<b>182</b>	<b>86.27</b>	<b>493</b>	<b>96.67</b>	<b>2.71</b>	<b>1.12</b>	
<b>Global Output</b>	<b>211</b>	<b>100</b>	<b>510</b>	<b>100</b>	<b>2.53</b>	<b>1</b>	

\*Note: TNP=Total Number of Papers; TNC=Total Number of Citations; CPP=Citations Per Paper; RCI=Relative Citation Impact

**Figure-3: Network visualization mapping of contributed countries on Jainism related global research (the map was created by VOSviewer)**



### Active Institutions or Organizations in Jainism

One hundred sixty ( $n=160$ ) institutions unevenly participated in global research publications on Jainism. The top ten institutions' share ranging  $3 \geq 6$  documents respectively. Their combined output contributed 18.46 per cent ( $n=39$ ) global research publications share with 19.02 per cent ( $n=97$ ) citations. It evident that in publishing research in Jainism was dominated by Universiteit Gent, Belgium with 2.84 per cent ( $n=6$ ) documents followed by Loyola Marymount University,

USA with 2.37 per cent document ( $n=5$ ). The resultant data showed that 125 institutions published 1 paper each, whereas, 32 institutions published  $2 \geq 4$  papers respectively. The institutions having relative citation impact (RCI) less than one ( $n < 1$ ) implies that the research output was not proportional with their impact (Figure 4; Table 10).

### Active Journals in Jainism

Bradford's law is applied to measure the core journals in the studied domain research field. The journals are arranged in decreasing order of their productivity. Of the total 211 global research publications on Jainism, 130 documents appeared as articles in 85 core journals. Out of the 85 sourced journals, majority of journals ( $n=76$ ) published  $1 \geq 2$  articles each. *Religion* topped the most productivity journal with 6.16 per cent ( $n=13$ ) followed by *Journal of Indian Philosophy* and *South Asian History and Culture* with 2.84 per cent ( $n=6$ ) each. The 23.66 per cent ( $n=50$ ) of total 85 journal articles on Jainism was contributed by the top 10 leading journals. The top twenty journals shared 9.61 per cent ( $n=49$ ) citations of the total 510 citations. Journals having relative citation impact (RCI) less than one ( $n < 1$ ) implies that the research output was not proportional with their impact. The scientometric mapping of research collaboration in the Jainism for top 10 journals yielded 6 clusters with 4 links and total link strength (TLS) of 5 (Figure 5; Table 11).

**Table-10: Top Ten Active Institutions in Publishing Jainism Related Research (2010-2020)**

Active Institutions	TNP	%TNP	TNC	%TNC	CPP	RCI	Rank
Universiteit Gent	6	2.84	6	1.18	1.00	0.41	1
Loyola Marymount University	5	2.37	23	4.51	4.60	1.90	2
The University of Edinburgh	5	2.37	15	2.94	3.00	1.24	3
Yale University	4	1.89	6	1.18	1.50	0.62	4
University of Ottawa	4	1.89	1	0.19	0.25	0.10	5
Université de Lausanne	3	1.42	19	3.73	6.33	2.62	6
Indian Institute of Technology, Bombay	3	1.42	0	0	0.00	0	7
University of Connecticut	3	1.42	24	4.71	8.00	3.31	8
University of North Texas	3	1.42	1	0.19	0.33	0.14	9
University of Oxford	3	1.42	2	0.39	0.67	0.28	10
<b>Share of 10 top institutions</b>	<b>39</b>	<b>18.46</b>	<b>97</b>	<b>19.02</b>	<b>2.49</b>	<b>1.03</b>	
<b>Global Output</b>	<b>211</b>	<b>100</b>	<b>510</b>		<b>2.53</b>	<b>1</b>	

\*Note: TNP=Total Number of Papers; TNC=Total Number of Citations; CPP=Citations Per Paper; RCI=Relative Citation Impact

**Table-11 : Top Ten Active Journals in Publishing Jainism Related Research (2010-2020)**

Active Journals	TNP	%TNP	TNC	%TNC	CPP	RCI	Rank
Religions	13	6.16	8	1.57	0.62	0.25	1
Journal of Indian Philosophy	6	2.84	9	1.76	1.5	0.62	2
South Asian History and Culture	6	2.84	2	0.39	0.33	0.14	3
Journal of Indian Council of Philosophical Research	4	1.89	3	0.59	0.75	0.31	4
Modern Asian Studies	4	1.89	7	1.37	1.75	0.73	5
Religions of South Asia	4	1.89	5	0.98	1.25	0.52	6
Sophia Studies in Cross-Cultural Philosophy of Traditions and Cultures	4	1.89	0	0	0	0	7
Actual Problems of Theory and History of Art	3	1.42	0	0	0	0	8
Indian Journal of Psychiatry	3	1.42	9	1.76	3	1.24	9
South Asia: Journal of South Asia Studies	3	1.42	6	1.18	2	0.83	10
<b>Share of to 10 journals</b>	<b>50</b>	<b>23.66</b>	<b>49</b>	<b>9.61</b>	<b>0.98</b>	<b>0.41</b>	
<b>Global Output</b>	<b>211</b>	<b>100</b>	<b>510</b>	<b>100</b>	<b>2.53</b>	<b>1</b>	

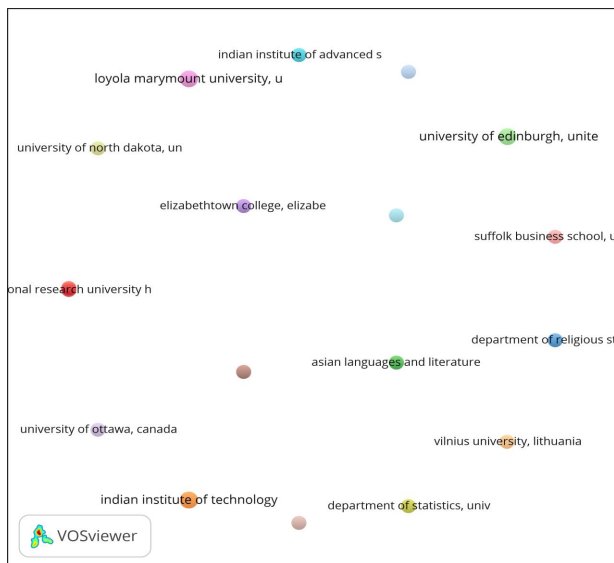
\*Note: TNP=Total Number of Papers; TNC=Total Number of Citations; CPP=Citations Per Paper; RCI=Relative Citation Impact

### **Subject-wise Breakup of Global Output**

The finding revealed that there is a considerable research output in the areas of Arts & Human-

ties with 74.88 per cent ( $n=158$ ) and Social Sciences with 42.65 per cent ( $n=90$ ). Other subject areas appeared ranging from 1  $\geq$  12 publication share (Table 12).

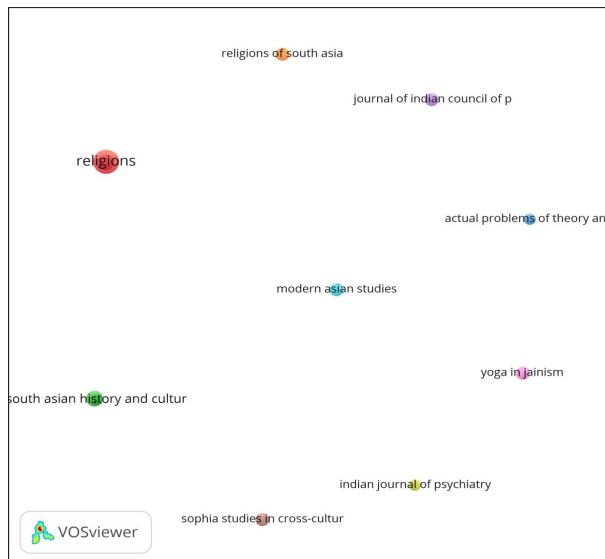
**Figure-4: Network Visualization Mapping of Contributed Institutions on Jainism Related Global Research (the map was created by VOSviewer) (\*The Scopus data on organizations may not have been harmonized. Organization names have not have consistent format)**



**Important Keywords Appeared in Global output**

Keywords are considered as important indicators towards understanding research trends in concerned area. Of the total 640 keywords, 22 meet the threshold with minimum 3 occurrences yielded 6 clusters with 69 links and 188 total links strength. The 22 identified keywords are represented in decreasing frequency of their frequency in literature

**Figure-5: Network Visualization Mapping of Contributed Journals on Jainism Related Global Research (the map was created by VOSviewer)**



during 2010-2020. It was revealed that Jainism ( $n=78$ ), Buddhism ( $n=20$ ), and Hinduism ( $n=14$ ) have been seen as the most productive keywords (Figure 6; Table 13).

**Highly-cited documents**

Among 211 global publications on Jainism, only 8 papers emerged as highly cited papers that registered between  $13 \geq 109$  citations. Highly cited papers accumulated a sum of 259 (50.78%) citations during the time span 2010-2020 (Figure 7).

**Table-12: Subject-wise Breakup of Global Publications on Jainism Related Research (2010-2020)**

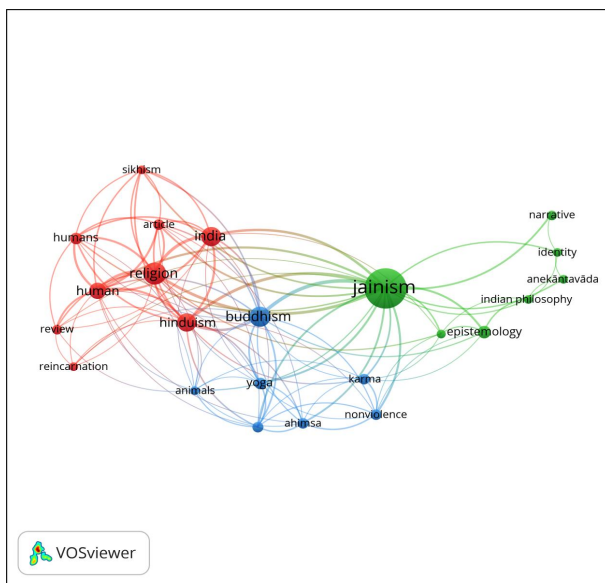
Subject-wise Breakup	TNP	%TNP
Arts and Humanities	158	74.88
Social Sciences	90	42.65
Medicine	12	5.68
Business, Management and Accounting	11	5.21
Economics, Econometrics and Finance	11	5.21
Environmental Science	7	3.31
Psychology	6	2.84
Biochemistry, Genetics and Molecular Biology	4	1.89
Veterinary	4	1.89
Agricultural and Biological Sciences	3	1.42

\*Note: TNP=Total Number of Papers; Scopus data on subject areas may not have been harmonized inflates the counts.

**Table-13: List of Important Keywords Appear in Jainism Related Global Research (2010-2020)**

Sr. No.	Keyword	Frequency	Total Link Strength
1.	Jainism	78	94
2.	Buddhism	20	50
3.	Hinduism	14	39
4.	Epistemology	8	13
5.	Religion	8	9
6.	India	7	13
7.	Yoga	7	21
8.	Ahimsa	6	20
9.	Karma	6	13
10.	Nonviolence	6	20
11.	Vegetarianism	6	25
12.	Narrative	5	6
13.	Anekāntavāda	4	5
14.	Identity	4	6
15.	Indian Philosophy	4	7
16.	Reincarnation	4	3
17.	Asceticism	3	5
18.	Gwalior	3	3
19.	Pilgrimage	3	1
20.	Sallekhana	3	2
21.	Sikhism	3	11
22.	Veganism	3	10
	<b>TOTAL</b>	<b>205</b>	<b>188 (TLS)</b>

**Figure-6: Network visualization mapping of important keywords on Jainism related research (the map was created by VOSviewer)**



**Funding Agencies in Jainism Research**

Of the retrieved publications, only 10.90 per cent ( $n=23$ ) publications were funded projects. The Research Foundation; Flanders of Belgian with 0.95 per cent ( $n=2$ ) was the most active funding agency in the concerned field of study.

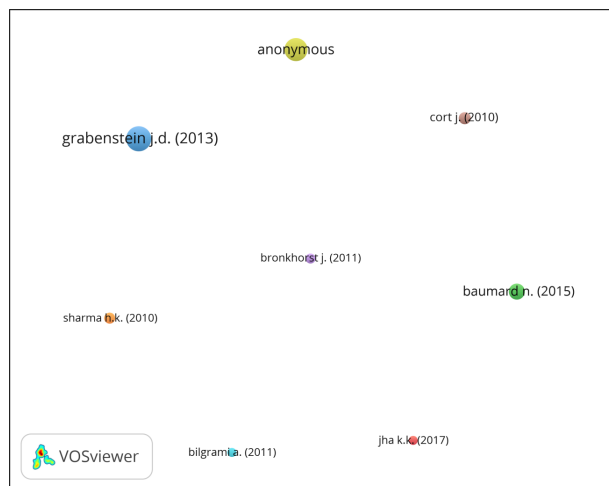
**Research Trends in Jainism**

The study provides a quantitative and qualitative assessment of global research publication output on Jainism. The study is based on 11 years’ global research data ( $n=211$ ) on the topic sourced from Scopus database for the time span 2010-2020. The research progress on Jainism at global level is summarized below:

- The global research publication output on Jainism registered 18.61 per cent annual average growth rate and 4.14 per cent compound average growth rate with an average 2.53 citations per paper



**Figure-7: Network visualization mapping of highly cited documents on Jainism related research (the map was created by VOSviewer)**



during the period. The highest annual output 15.16 per cent ( $n=32$ ) registered in 2017.

- The relative growth rate (RGR) of the world's Jainism publication output decreases gradually from 0.79 to 0.10. On the other hand, doubling time (DT) indicates an increasing trend from 0.88 in 2011 to 6.93 in 2014. The mean average RGR of Jainism literature is 0.24 and DT is 3.51.
- It has been inferred from the data that the total average number of authors per paper was 1.27 and the average productivity per author was 0.79.
- The resultant data inferred significant and positive relationship ( $r = 0.960$ ,  $N = 11$ ,  $p = 0.000$ ). As the  $p$ -value is  $<0.05$ , therefore, it is highly significant. It means that the higher numbers of co-authors were contributed to the higher number of papers.
- During the period from 2010-2020, only 57.82 per cent ( $n=122$ ) documents have been published under different categories of open access. Of the total 211 publications, 47.87 per cent ( $n=101$ ) appeared as articles and 95.27 per cent ( $n=201$ ) appeared in English language.
- The top ten author's productivity varied from  $2 \geq 6$  publications per author. Their combined output shared 16.57 per cent ( $n=35$ ) global research publication and 11.37 per cent ( $n=58$ ) global citations.

- It was found that in publishing research in Jainism was dominated by United States of America with 37.92 per cent ( $n=80$ ) documents and 65.88 per cent ( $n=336$ ) global citations.
- The top ten active organizations' combined output contributed 18.46 per cent ( $n=39$ ) global research publications share. It is evident that in publishing research in Jainism was dominated by Universiteit Gent, Belgium with 2.84 per cent ( $n=6$ ) documents.
- *Religion* topped the most productivity journal with 6.16 per cent ( $n=13$ ) documents. The 23.66 per cent ( $n=50$ ) documents on Jainism was contributed by the top 10 leading journals.
- Arts & Humanities with 74.88 per cent ( $n=158$ ) and Social Sciences with 42.65 per cent ( $n=90$ ) publication share were the most favoured research areas in pursuit research on Jainism.
- It was revealed that Jainism ( $n=78$ ), Buddhism ( $n=20$ ), and Hinduism ( $n=14$ ) have been seen as the most productive keywords.
- Only 8 papers emerged as highly cited papers that registered between  $13 \geq 109$  citations. Highly cited papers accumulated a sum of 259 (50.78%) citations during the timespan 2010-2020.
- The resultant data found that only 10.90 per cent ( $n=23$ ) publications were funded projects. The Research Foundation Flanders of Belgian with 0.95 per cent ( $n=2$ ) was the most active funding agency in the concerned field of study.

## Conclusion

The study provides a comprehensive macroscopic overview of global scholarly research output on Jainism and performance over the time. The result of study shows that 211 research publications covering Jainism were published in different journals and give the insights of research progress at global level. This is the output from the past 11 years covering 2010-2020 and revealed that there exhibit a significant increase in the research productivity. Due to 'publish or perish' academic culture or researchers' keen interest in this field, the Jainism research increase with every passing day. The outcome of the study may help researchers to identify the progress in Jainism research at global level. In addition, it will also help to identify the prolific authors, journals, institutions and countries/territories in the development of research.

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# Future Technologies of Instruction that will Re-shape Education

Ismail Thamarasseri\* and Divya Martin\*\*

Technology has changed the way we see the world. With different kinds of unique technology appearing every moment, we should not be surprised to see several parts of the world experiencing huge changes. Technology has rapidly changed every facet of our society, including the education industry. Today students grow up with internet-connected devices at home and in the classroom, which changes the way they learn. Future education technology will transform learning by giving teachers and students a variety of new tools to work with. The steady pace of technological advances in education are trending to help make teaching a career with an excellent future. Education is an important part of every society. Emerging technologies in education all share a similar objective; to revolutionize the learning process of learning for students. These technologies pledge to better enhance the way teachers and students work. And with such technologies ruling our modern world, education is sure to get a re-shape. Students can make better use of each of the above technology by looking into each one. By researching each one, they obtain special insights on just how they can get the best out of their usage. On the other hand, teachers can use online course platforms to enhance the learning environment. Nowadays, students become increasingly involved in forming their own education. In ten years, students will incorporate so much independence into their learning process, that mentoring will become fundamental to student success. And teachers will form a central point in the jungle of information that students will be paving their way through. The future of technology in education is about adapting to the fast-changing world, giving students an opportunity to choose their own way of learning, combining theory and practice.

The world is changing at a fast pace, and we are surrounded by tech-enabled innovations and advancements that impact all sectors and societies. Technology is a tool that can improve education in many ways. To make education enjoyable, experiential and a seamless experience, technology adoption

is critical and its role will only grow in the future. The current generation of learners are either digital natives or early adopters and hence are better placed to embrace these dynamic changes. Teachers, students, and parents all benefit from free online resources, personalized learning materials, and opportunities for advanced learning. By incorporating digital quizzes and assessments, videos, simulations, and gamification elements into course content, educators can create a dynamic learning experience for each student on an individual level. By capitalizing on the digital habits of students, the classroom can be filled with interactivity regardless of the class size or topic. The developments that have emerged in this field are empowering educators to create remarkable learning experiences for today's young minds. Educational institutes have been upgrading and integrating technology in teaching practices, methodologies, and curriculum to stay relevant. The pandemic has catalysed digital adoption and the parent community has also experienced the relevance, need, scope and power of technology in imparting holistic education. In the field of education, it is imperative to have a futuristic outlook so that best practices are implemented. Technology helps identify learning gaps, boost engagement and monitor progress better over time by recognizing individual capabilities and delivering as per requirement. Technology inclusion in today's age is helping parents track movement and progress in their child's education.

Collaboration through technology can enhance students' interaction, engagement, learning and thinking skills, in addition to increasing the flexibility and diversity of their educational experience. Technology-supported collaboration can enhance students' awareness of global challenges and develop their understanding of other cultures. Traditional learning models rely on standardized lectures and educational materials. Over the past few years, tech advancements have been challenging this paradigm.

An important use of technology is its capacity to create new opportunities for curriculum and instruction by bringing real-world problems into the classroom for students to explore and solve. Technology can help to create an active environment in which students not only solve problems, but also find their own problems. This approach to learning is very different from the typical school classrooms, in which students spend most of

\* Assistant Professor, School of Pedagogical Sciences, Mahatma Gandhi University, Kottayam, Kerala, India-686560. E-mail: ismailtkl@gmail.com

\*\* MPhil Research Scholar, School of Pedagogical Sciences, Mahatma Gandhi University, Kottayam, Kerala, India-686560. Email: evergreendiya@gmail.com

their time learning facts from a lecture or text and doing the problems at the end of the chapter. Here are the future technologies of instruction that will reshape education.

### **Use of Augmented Reality in Education**

Augmented Reality (AR) is an enhanced version of the real physical world that is achieved through the use of digital visual elements, sound, or other sensory stimuli delivered via technology. It is a growing trend among companies involved in mobile computing and business applications in particular. The education sector can provide better and focused learning opportunities with the help of augmented learning. Students getting access to e-learning through augmented learning technology through an interactive environment will provide them with the opportunity to retain information better. Learning has been shifted to a virtual classroom due to the pandemic. Augmented learning will take virtual learning way ahead with the help of new products introduced in the market. These engagements will provide virtual situations and objects that will make learning more interesting and interactive. Teachers could take their students to remote and dangerous places without ever leaving the classroom by streaming AR feeds to them. The *Edify* is an immersive, accessible, and expansive augmented reality learning platform available anywhere in the world. It creates bespoke 3D learning environments, including virtual labs where students can carry out experiments using a VR headset and hand controllers. The *Spark* built a platform that allows educators to search for and upload lesson plans, which can then be turned into interactive and multi-sensory learning experiences for students. As the students learn, the platform uses voice technology to listen in on student progress and provide comprehensive feedback for teachers, which can improve future lessons.

### **Smart Device-based Learning**

Children are often inquisitive about devices and show greater interest in learning tech skills through gadgets. Usage of advanced learning devices helps them learn better and check their progress in real-time through testing their learning outcomes. Such interactive devices are believed to involve students in active learning, improve critical readiness skills, and enhance concept retention. A scan-marker backed by Artificial Intelligence (AI) to scan and edit text directly to the cloud can help fast learning and quick absorption of information. Even, e-learning solutions in smartphones offer powerful teaching tools, through which a student can learn anytime and also plan their assignments in order.

### **Interactive Boards**

As most schools are gearing up to get back to physical classes' post-covid-19 pandemic, to transition students from the virtual classrooms to physical ones, educators must look at the tech-enabled setup. Introducing interactive boards in schools will help students learn through a 3D projection and more. In higher secondary classes, interactive boards are going to see a much faster adoption since it provides better and focused visual learning options.

### **Performance Analysis System**

Including sports and co-curricular activities like dance, music, and art among the rest is an important part of the school curriculum. These play a crucial role in shaping a child's life and overall development. Having a performance analysis mechanism or technology in place at schools will help students understand individual areas for improvement and perform better.

### **Robotics Lab**

New-age schools are always preparing for the future and working on innovations that enhance interactivity and learning. Through Robotics students can explore multidisciplinary projects and learn valuable life and career lessons. Schools offering robotics labs help students explore various learning pathways. An example is *Robot-Assisted Language Learning in Education (RALL-E)*, in which students learn language with a robot that exhibits a range of facial expressions and gestures, coupled with language dialogue software. Such robots will allow students to engage in a social role-playing experience with a new language without the usual anxieties of speaking a new language. The RALL-E also encourages cultural awareness while encouraging good use of language skills and building student confidence through practice.

### **Facial Recognition Based Security System**

With the aim to make schools a safe and secure place for students, schools have started adopting facial recognition-based security systems to help monitor and add a layer of security for the students and staff at school. Parents feel more comfortable knowing their children at school are safe with the help of an extra layer of security and monitoring.

### **Virtual Reality**

Virtual reality creates a completely immersive virtual environment that allows users to interact with their environment as if they were actually there. A lot of VR technologies already exist, but many classrooms do not utilize this technology. Virtual reality technology

can be used to create unique learning experiences that engage a student's imagination and creativity. Platforms like *Immersive VR Education* and *Nearpod* exist to allow educators to create lesson plans using virtual reality technology.

### **Education Technologies Based on Artificial Intelligence (AI)**

Integration of AI in schools will help both students and teachers. Customised education, evaluation, progress analysis, etc., will gradually make the system faster by integrating artificial intelligence. Simultaneously, it is also going to be a part of the curriculum as India starts making progress on adapting to the National Education Policy (NEP) 2020. Artificial Intelligence is very well regarded as one of the most discussed technology trends in the world. Due to its smart approach towards various systems, the world has come to trust its technology in its development. Although used in various fields, AI is not limited to the field of education.

It allows teachers to automate many repetitive processes, such as creating curricula. It saves educators time and enables them to focus on the creative aspects of their jobs. It provides access to global learning. AI eliminates any geographical or language barriers. For example, there are many tools based on natural language processing that can translate educational materials into various languages in real-time. AI voice assistants, such as *Alexa* or *Cortana*, are gaining popularity in education.

### **Usage of 5G Technologies in Education**

5G is the fifth generation of wireless technology, and promises high speed, low latency wireless technology. It could enable quicker downloads, more powerful networks and a near-immediate transfer of information.

### **Increased use of Games and Simulations**

By designing lectures as a game, educators encourage students to face and accomplish various challenges and goals. This promotes higher student engagement and could help students retain knowledge more effectively. It also helps students reframe subjects they may consider burdensome or boring as engaging and fun. The Gamification enables students to receive instant feedback through the use of leader boards and dashboards that can show how students rank among their peers. This can foster a spirit of healthy competition among students and motivate them to complete assignments to the best of their abilities. Simulations create a scenario-based environment, where students

interact to apply previous knowledge and practical skills to real-world problems, also allowing teachers to reach their own goals. Students are involved actively in a situation that feels urgent and must decide what to measure and how to analyse data in order to solve a challenging problem. Examples include *RoomQuake*, in which an entire classroom becomes a scaled-down simulation of an earthquake.

### **Adaptive Learning**

Adaptive learning is a technology that provides learning activities to students, based on their needs and learning style/behaviour. Consider adaptive learning as a piece of tech which adapts to every students' needs in a short time. It helps students to adapt to unique learning paths that are entirely based on their interests and learning ability. Adaptive learning has its primary application in the field of education. Adaptive learning models focus on students as individuals with different learning needs. By understanding each student's learning pace and preferences, teachers can improve the effectiveness of lectures, set up relevant group projects, and effectively handle each student's needs. Most importantly, students have more autonomy in the classroom. Adaptive learning tools and methods are not a threat to traditional educational models. With the rise of tech in education, teachers tend to deliver more personalized learning experiences on a case-by-case basis. Adaptive learning tools are quickly replacing traditional textbooks in the classroom since they allow students to learn at the pace that is best suited to their preferences and level of knowledge.

### **Competency-Based Education**

In 2021, people should expect competency-based education to be playing a vital role in the system of education. Through this special technology, students get to be matched with learning activities that are designed for their level of learning ability. In more detail, competency-based education provides a means for students to advance their learning experience based on their ability to master a skill. This allows students to learn at their own pace regardless of the environment. Through competency-based education, students can efficiently provide better outcomes. It helps to measure outcomes that are entirely based on a student's objective demonstration of competency in a given area.

### **Learning Analytics**

As an emerging technology, learning analytics is now being used by teachers to better record the learning behaviours of students. Another unique benefit of keeping track of student learning rates and behaviours is that most teachers will stand the chance

of providing targeted improvements to courses. In education, improvement is a very important factor that aids the learning experience of every student. This is what learning analytics can help teachers deliver to their students.

### **Cloud Technologies Enable Remote Learning**

Modern learners are tech-savvy. Whether they are studying remotely or in a traditional classroom, learners are always connected. They are not limited to textbooks anymore. When looking for information, they will grab their smartphones, laptops, or tablets to get answers to their questions faster. The rise of mobile technologies has encouraged the growth of the cloud sector in education. There are many benefits of the cloud for both teachers and students. One of them is remote learning. The Covid-19 pandemic has forced many schools to replace traditional classroom experiences with virtual ones. The cloud infrastructure enables schools to create virtual classrooms for their students. That way, they will attract students from different locations and reduce infrastructural expenses. With cloud technologies, teachers can deliver online lectures to remote students. Cloud storage apps like *Dropbox* or *Google Drive* let students and teachers upload files in real-time.

With automation, students can get a better chance of receiving lectures automatically at specific times. Lectures can be digitally scheduled. Biometrics are physical or behavioural characteristics that can digitally identify a person. They include obvious defining features, like fingerprints and facial patterns, and more idiosyncratic behaviours, such as speech and even typing patterns. Some schools have already integrated eye-tracking software to see how students concentrate and absorb information. This data can help teachers to design more effective lesson plans and learning resources, resulting in higher grades for each student. Biometrics can track student attendance and punctuality, helping build positive habits that will help them later in life. It can also streamline library lending services, prevent cheating in exams, as well as keep students and teachers safe by stopping unauthorized persons from entering school campuses.

### **The ways Future Technologies Help Education**

#### ***It Helps Students Learn More (and better)***

Students learn in different ways. In a traditional lesson, a teacher presents material, and students all engage with it in the same way. The entire class is expected to move through the content at the same pace. Online tools give students more flexible learning experiences. Some students might use a *YouTube* video

tutorial to better understand a concept. Others might complete an online activity or game that provides instant feedback so they know if they are on the right track. Students who understand the material right away can find more difficult problems or activities to supplement their knowledge, while those who need more practice can use a different activity that provides more repetition. In other words, technology offers variety to students in a way that a typical classroom lecture cannot.

#### ***It Helps Parents Stay Connected and Help their Children***

When technology played a minimal role in education, parents had very little insight into what was happening in their students' education beyond what they were told at home or during parent-teacher conferences. With the help of technology, parents can be much more informed and involved in their children's learning process. When parents play a role in education, students are more likely to succeed and be motivated to learn. Parents have access to real-time updates on their children's grades, attendance, and even classroom behaviour reports through the Learning Management Systems (LMS). If parents struggle to help their children with homework, technology can be a great aid. Sites such as *Khan Academy* can provide step-by-step tutorials on many classroom subjects. Websites such as *Classcraft* can help provide personalized learning opportunities for students through gamification. For example, students can progress at their own pace through a lesson plan through a *Quest* set up by the instructor. They can even earn rewards and unlock points for their characters upon successfully completing a *Quest*, which keeps students motivated and excited to learn.

#### ***It Provides Handy Tools and Opportunities for Teachers***

Teachers enjoy technology because it offers plenty of tools to enhance classroom learning, communication with parents, and their own professional development. Teachers can find materials that they can present to students or sites that can help students practice new material. They can easily email an entire class or send a *Remind.com* text message to all parents simultaneously. Nowadays, university classes and entire degree programs can be taken online. There are also websites where teachers can help and support one another. Thousands of articles are at their fingertips to help them learn about what is changing in the field of education and discover some of the best practices are from around the world.

### ***It Introduces more “Teachers” to the Classroom:***

As the typical classroom size continues to grow, technology provides a way to make it seem a bit smaller and more manageable. Students can get instant feedback from online resources even if the classroom teacher cannot be available for an entire class all at once. Computers can provide students various levels of instruction based on their individual learning needs. When classes were smaller, a teacher could differentiate individual lessons for each student. With larger classes, technology can help teachers differentiate for all students in the classroom. There are plenty of programs, sites, and tutorials that offer students instant help whether they are at home or at school. These help teachers provide individual instruction and give them time to work one on one with students while others advance at their own pace using online tools. Sites like *Quizlet* are excellent for practicing vocabulary and getting immediate feedback.

### ***It Offers more Opportunities for Project-based Learning***

Nowadays, technology allows students to engage in project-based and inquiry-based learning. Students can work in groups or as individuals, and by using programs like *Google Classroom*, teachers and group members can chime in and provide feedback in real time. Students can live edit together in *Google Docs* and *Slides* and simultaneously create presentations or group papers. These projects help students use more critical thinking skills and less rote memorization. Students have access to unlimited resources for research and learning about any particular subject. They can use their research to propose solutions to real-life problems rather than creating a poster board of regurgitated facts. Technology also gives students more freedom in how they want to complete an assignment - like making a blog, website, video, and more.

### ***It can Save Money***

Although devices such as *Chromebooks*, *iPads*, and computers all cost quite a bit of money, they are worth the investment when you consider what they are able to provide. In the long term, these devices offer so many tools that they more than pay for themselves. Teachers can upload assignments to *Google Classroom* or learning management systems instead of using hard-copy. Many schools nowadays opt to buy e-books, which can be more convenient for students and do not need maintenance or storage.

### **Conclusion**

Education is set to experience a huge level

of reshaping from many emerging technologies. New technologies, such as artificial intelligence, virtual reality, and machine learning are reinventing the traditional educational methods. They have transformed the role of educators and created major shifts in approaches to teaching. The focus is on hyper-personalized student experiences, where learners are perceived as individuals with unique skills, needs, and problems. The “old-fashioned” pencil-and-paper methods of learning are still needed in the classroom. But technology introduces lots of great tools to help students learn more efficiently. However, to realize fully the benefits of technology in our education system and provide authentic learning experiences, educators need to use technology effectively in their practice. The modern environment has created technology not specifically designed for education but that can perfectly enhance the classroom. Technology will certainly be a major factor in how education in the future differs from education today. Definitely, the future technologies of Instruction will reshape the educational experience.

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## Investing in Yourself is the Only Way to Succeed

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**Kumar Mangalam Birla, Chairperson, Board of Governors, IIMA delivered the Convocation Address virtually at the 56<sup>th</sup> Annual Convocation of Indian Institute of Management Ahmedabad, Gujarat on 8<sup>th</sup> May, 2021. He said, "You must ask yourself just one question. Did I make a difference? It doesn't matter whether you are a marketer or a consultant, an entrepreneur or a techie. Have you advanced progress in your field and added to the cumulative repository of knowledge and wisdom? If the answer is yes. Then you have done justice to the education you have received and lived up to the rich legacy of this iconic institution. You have enhanced your life with education; now enrich it with meaning, purpose, and the thrill of being part of a shared endeavour. The quest for which commences today." Excerpts**

**The Convocation Address collected from the Website of IIMA is being published for wider dissemination in academia.**

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When Bob Dylan penned the iconic song 'Times they are a change in', which became an anthem for change across generations, I don't think he would have remotely imagined the world that we are living in today. In the last 12 months, we have witnessed and embraced change of an unprecedented magnitude. While we have all been robbed off the energy and intimacy of doing this convocation ceremony at the Louis Kahn Plaza, like every year, I am sure all of your digital avatars aren't complaining. As political scientist Ivan Krastev put it, "It might be only for this weird moment in history, but we cannot deny that we are currently experiencing what it feels like to live in one world."

Hidden behind the stories of loss and valour; agony and awe; ruin and revival; is the power of the human spirit. A collective spirit that has enabled us to wrestle with this pandemic for over a year now. A spirit that has been tested, again and again. But a spirit that will triumph, no matter what.

The class of 2021 will be like no other before it. The young people of the World War 2 generation were witness to the massive increases in industrial productivity that came with ramping up automobile, aerospace, and other production to meet the needs of the war years and the demand boom that came post that. Classes graduating in the dotcom bubble years of 2000-01 took away lessons about the husbanding of capital and the need to build more sustainable businesses that transformed what it meant to be an internet company. This pandemic has again stimulated innovation as a broad swathe of companies and consumers have embraced 'digitization'. In the 4 months of 2021, the startup ecosystem in India added over 10 new unicorns whose mix represents everything from interest in financial services to business enablers and our need for human connectivity.

This class is in a unique position. Having had the ability to take a student's dispassionate look at a world

in turmoil, you are now stepping into it, to leave your mark as a young leader whose intellectual appreciation of business problems is balanced by a compassionate understanding of the people involved.

The convocation ceremony today marks the culmination of a glorious chapter in your life. This glorious chapter has been defined by three hallmark traits, that I assume are common to all of you - strong academic record, all-round skills that go beyond the classroom, and of course the great hunger to succeed. I call this the trinity of records, skills, and attitude.

Congratulations on successfully completing Chapter 1 of what is going to be the book of your career. Getting to IIMA, completing your course, and finding a marquee job, which is a springboard to new horizons and new opportunities.

Today also marks the beginning of an entirely different chapter in your life. Chapter 2. Success in this leg of your career is entirely predicated on the investments you make, the risks you take, and the learnings you garner over the next 10 years.

Today is perhaps a good day to pause and consider what could be that X factor which will make the difference between just 'coasting along' and 'taking off exponentially' in your life and career. Let me share my thoughts on what could make that difference.

First and foremost, define your North Star: The pandemic and the last 12 months have again shone a spotlight on not just the role of governments but of societies, companies, and individuals in creating better outcomes for all of us. This is a period of short forecast horizons and amplified ups and downs. And therefore, a more important time than ever to define your principles and set your heading. Where do you fit in, and what do you want to be known for? Now is a good time to mull over and define the answer. Second, Experiment in your



20s: While your North Star is clearly in your sights, in the short term, the 20s should be the discovery phase of your next chapter. As a wise businessman once said, “Risk taking is inherently failure-prone, otherwise it would be called sure-thing-taking.” I feel that too many management graduates enter the corporate world with a ‘this is what I want to do’ attitude. When I say experiment, I don’t necessarily mean start your own business or company. Rather, Work in a factory, work in a different country, work in diverse sectors, work across unfamiliar functions. The opportunity cost of experimenting rises sharply as you grow in your career. So, start early and experiment. Be impulsive. But temper your impulsiveness with creativity and positivity. Be thoughtful of what you want to focus on and what is the common thread that strings together your experiments and experiences. Which brings me to my next connected point.

Third, Build your personal flywheel: It was legendary artist Vincent Van Gogh who had remarked that “Great things do not just happen by impulse but are a succession of small things linked together.”

Your personal flywheel is nothing but your own set of cumulating personal experiences. Think about experiences as units of learning. The more units you can accumulate in a year the more valuable you become. The sooner you start accumulating, the more you accumulate as you go along, as the power of compounding kicks in. Remember, your ability to learn is elastic by nature.

Units of learning should guide your career choices. If you are ever wrestling with a career choice, the defining factor should be the units of learning. Always, make a choice that accelerates your own learning curve and improves your understanding of the world. Let me illustrate this point on building a flywheel and experimenting, using the example of an unconventional entrepreneur. At the age of 20, he opened the first record shop and turned a millionaire in 3 years. He went from running a small record shop to starting up a record label to launching music megastores. In his early 30s, when a flight he was set to board got cancelled, he hired a plane, sold tickets, and filled it up with fellow stranded passengers. This experience set in motion the idea for his successful airline business. Aviation was the fount on which his current conglomerate is built, spanning diverse sectors from travel, transport, entertainment, media, and telecoms. His name is Richard Branson. He was always restlessly entrepreneurial, something that you too can be, even within the boundaries of an organization. Remember, you don’t have to be a start-up entrepreneur to turbo charge your flywheel.

And finally, add emotion to IQ: I know all of you have burnt the midnight oil over the last 2 years solving complicated business problems. The reality is that you can’t build businesses with spreadsheets. The most detailed business plans this year unraveled in the face of factory workers falling sick. Supply chains came unstuck as the migrant labour silently powering them retreated to their communities. Therefore, don’t get unidimensional in the way you think. You need to add other dimensions to your thinking, most importantly, of empathy and humility. I don’t see IQ and EQ as binary qualities, but rather as complementary traits that make a personality wholesome.

The irony, perhaps, is that even AI is now starting to hold up a mirror to ourselves. Microsoft’s Socio chatbot- Xiaoice boasts of having both IQ and EQ. It has social skills and understanding of human emotions. It writes music, sings, paints, and has a fine arts degree. Xiaoice has had a 29-hour conversation with a human being! In total it has had over 30 billion conversations with 100 million friends. Just pause and think about it, a chatbot is learning social and cognitive skills to build EQ.

The times they are a changin’!

To summarize, what I have said is – have clarity on your North Star, but then be adventurous and experiment, use these experiences to build your flywheel and compliment your IQ with EQ.

A decade down the line, you will be confronted with a question: How do you measure this journey that kicked off through this virtual convocation ceremony? The Chapter 2 that I referred to. What benchmarks should you hold yourself accountable to? Is it the pace of promotions? The salary you draw? The designation you hold? The companies you float?

I think it’s a simple answer.

You must ask yourself just one question. Did I make a difference? It doesn’t matter whether you are a marketer or a consultant, an entrepreneur or a techie. Have you advanced progress in your field and added to the cumulative repository of knowledge and wisdom? If the answer is yes. Then you have done justice to the education you have received and lived up to the rich legacy of this iconic institution.

IIM-A isn’t just a B-school. It’s more than just an institution or a badge of honour. It is now a permanent part of you. You have enhanced your life with education; now enrich it with meaning, purpose, and the thrill of being part of a shared endeavour. The quest for which commences today. □

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## CAMPUS NEWS

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### **Online Academic Conclave on In Search of Alternatives to Board and University Examination**

One-day Online Academic Conclave on 'In Search of Alternatives to Board and University Examination' was organized by the Educational Technology and Management Academy, Gurgaon, Haryana on June 26, 2021. About sixty four scholars from various parts of India, Canada, Sweden, and Bangladesh participated in the Conclave.

After a formal exchange of greetings, Chairperson of the Session, Prof Madhu Parhar, Head, Educational Survey Division, The National Council of Educational Research and Training (NCERT), New Delhi briefly introduced the invited speakers of the panel namely Shri Pramod Tripathi, Director (Academics), Global India International Schools, Singapore, Prof M M Pant also a Member of ETMA Council was introduced as a distinguished information scientist, former Pro Vice Chancellor of IGNOU, and an unconventional thinker. Prof. Parhar also mentioned one of the tweets posted on 17th June, 2021 by Prof M M Pant (<https://mmpant.com/2021/06/17/educating-oneself-for-an-unknown-and-uncertain-world/>).

Prof Indrani Bhaduri mentioned that the total focus should have been on the learning loss during the pandemic lockdown. Should educational scientists find out alternates to learning?, Prof Bhaduri questioned. Learning algorithms will lead to strategies for assessment. Learning and assessment go together. NCERT has been talking throughout about these school-based assessments. We need to explore more evidence-centred and teacher-relying assessment procedures. Prof Bhaduri said that there should not be any trust deficit between educational planners and the soldiers on the ground, teachers. In the assessment system, objectivity is ideal, but subjectivity is equally important. The assessors also need to understand that assessment has not only to be limited to the curriculum alone. Other inherent competencies have also to be taken into consideration. The same stands true for non-academic subjects such as sports or any others. So, holistic assessment should of the students needs to be carried out. We have the national achievement survey as well as international achievement surveys.

We have the TIMSS, the PISA and so on. We need to understand the basic difference between the two; when I'm talking about the assessment of the mechanism, we are trying to understand the system. The methodologies that are used for large-scale studies cannot be used for a single student. As there are many ways of learning, so there are many ways of assessment. That is why the paper-pencil test is not the only source of assessment. Assessment is putting the child in different challenging situations. I'm using this platform to promote foundational learning and foundational assessment as well. All in all, the tests and assessment procedures should help the child to learn, Prof. Bhaduri concluded.

Prof Pant started his presentation with the story of Einstein. According to him, in the changed circumstances, the questions which boggle the mind are---What do we teach? How do we teach? How do we assess? Where do we assess? Einstein mentioned in 1905 or 1906 while he wrote four papers. One of the papers was on the Brownian movement; another paper was on the theory of special relativity, the photoelectric effect. He got the Nobel prize, and still, another was on the famous equation of mass and energy that is  $E=MC^2$ . The question is--why did he write these papers: other great scholars- researchers like Max Bond, Max Planck who interpreted physics in a rigid situation. Einstein changed the laws of physics. A pretty similar situation is about the present assessment system.

All said and done, the Board exam results should come with a statutory warning that the given scores do not correlate with the skills and abilities of the candidate. Reasons being that research says that the answer to a question may vary from person to person and time to time. Marks of the same answer may vary enormously depending on the examiner, even in moralistic subjects like Mathematics and Science. Prof Pant elaborated that every judgment is written based on the available facts and circumstances of the case. Prof Pant quoted a book, 'The fourth education Revolution' by Anthony Seldon. He also talked about Seldon's career, Buckingham University and Wellington College. He also shared his rich experience as a member of the board of management of IIT Delhi. He said that a student could answer all the questions (5 or 6 questions) wonderfully well. But there is no

guarantee that student knows anything. That is why we need to have a comprehensive examination. In this age of artificial intelligence, one can say what is written in the book without looking at the book because they can ask Alexa, Google, etc. So higher level of effects is important. We should go for higher-level analysis, synthesis and creativity. Prof. Pant gave an example of the language learning free App 'Duolingo'. The App started at Carnegie Mellon University (CMU) in Pittsburgh, Pennsylvania, USA. He also talked about Reliance affordable smart phones, which will have all the features like augmented reality, artificial intelligence, camera, text to speech, speech to text, translation, etc. Can't we have a similar assessment to reach Bloom's Mastery learning. He said that pandemic had allowed us to do something new, think anew, change, and move forward. So, let's not think of going back to normal. Let's think of going to the future where we can address the challenge of numbers, the challenge of assessing the quality, the challenge of relevance. Against a question on school education, Prof Pant said that the school education is not preparing students for the University; it prepares the person to lead a life as an adult, without entering the university.

A threadbare discussion by the participants followed Prof Indrani Bhaduri and Prof Madan Mohan Pant's presentations. Ms Nirmala Thakur appreciated the thought of Prof. Indrani regarding the Trust factor between the Planners and Soldiers (Teachers) on the ground. Prof. Sudesh Mukhopadhyay, while appreciating the ideas of the presenters, said that the time has come when we should discard the Normal Probability Bell-shaped curve of normal distribution of abilities in the students. She also advised thinking about recording what all a person can do and potential areas of growth and development. Some schools have such records even 15 years back, but there are now too many centralised orders and regulations. Ms Nirmala Thakur brought home the point that a comprehensive document of a student's learning journey needs to be prepared. Dr Shivananda emphasised Prof Pant's contention that the disclaimer in the report card needs serious consideration. Mr Salil Adak asked how much does an exam help the students in learning? While highlighting the involvement of parents, he pointed out that the teachers and the parents must be exposed to lessons in child psychology, developmental psychology, etc. to change their mindset on evaluation, especially score-based assessment. He added that the parents are not empathetic to their children in most

cases, keeping in mind unidirectional development. Ms Sushma Sardana said that as teachers, we should prepare students for the Board examination and the whole life with relevant skills and values. We, as members of society will have to bring the change slowly and surely by talking about it to all around us. Dr Som Krishan and Dr Mrinal Mukherjee emphasised that the learners and parents must be taken into confidence. He further asked, "What should be the nature of the format of the entrance test?" That is how such selection criteria may be reframed and realigned with transversal competencies. Sushma Sardana pointed out that the entrance exams and public/board exams nowadays have some common components others who actively participated in the discussion were Ms Shalini Agarwal, Dr Sanjay Kumar Yada, Prof. Debasri Banerjee, Dr Tripti Bej, and Dr M N Baidya. Prof. Madhu Parhar concluded with remarks that COVID-19 has made the education scientist to realise that the conventional system of assessment and evaluation is no more relevant than the true evaluation of learning and skills. The alternate to the existing system of evaluation and assessment is most desired. It should be done at the earliest to save the blooming skills and abilities from the stranglehold percentage scores.

### **International Conference on Functional Materials and Simulation Techniques**

A two-day International Conference on 'Functional Materials and Simulation Techniques' is being organized by the University Institute of Sciences, Chandigarh University, Mohali, Punjab during January 10-11, 2022. The aim of the event is to unite prominent national and international researchers from universities, colleges, research organizations and enterprises on a solitary stage to share new learning and showcase their exploration in the developing areas of Functional Materials and Simulation Techniques for various applications.

In the recent years, there is a rapid development in the field of advanced materials which will improve the performance of various advanced technologies. Mainstream researchers are developing such technologies in Material Science which can help to reduce the efforts of scientists solving various problems. The Topics of the event are:

#### ***Track-1: Physics***

- Advanced Functional Materials for Energy Applications.

- Advanced Materials for Biomedical Applications and Biosensors.
- Electronic and Optical Materials.
- Superconductors and Magnetic Materials.
- Ultrafast Optics and Terahertz Radiations.
- High Energy Physics.
- Nuclear Physics.

#### **Track-2: Chemistry**

- Advanced Functional Materials for Energy Applications, Bio-medical Applications and Biosensors.
- Electronic and Optical Materials.
- Polymeric Materials.
- Nano Materials.
- Synthetic Organic Chemistry, Green/Sustainable Chemistry, Catalysis, Bio-fuels/Renewable, Natural Products

#### **Track-3 : Mathematics**

- Numerical Methods.
- Stochastic Modeling and Reliability.
- Graph Theory and Applications.
- Fuzzy Set Theory and Applications.
- Computational Techniques.
- Thermodynamically Models.
- Continuum Mechanics.
- Computational Fluid Dynamics.
- Process Modeling, Simulation and Optimization.
- Cryptography, Coding Theory and Information Security.
- Probability, Statistics and their Applications.
- Theory of Relativity.
- Topology, Functional Analysis and Algebra.
- Differential Geometry and Differential Equations.

- Fractal Theory.
- Fixed Point Theory.
- Mathematical Modeling.
- Computational Intelligence based Techniques for Optimization.
- Data Sciences.

For further details, contact Organising Secretary, University Institute of Sciences, Chandigarh University, Mohali-140413 (Punjab). E-mail: [lcfmst2022@cumall.in](mailto:lcfmst2022@cumall.in), Mobile No: 08146651515/07973020068/08146651559. For updates, log on to: [www.cuchd.in/icfnst](http://www.cuchd.in/icfnst)

#### **International Conference on Flexibility, Resilience and Sustainability**

A three-day International Conference on ‘Flexibility, Resilience and Sustainability’ is being organized by the Indian Institute of Management, Shillong, Meghalaya on April 21-23, 2022. It aims to provide a global forum for practitioners, policy makers, teachers, researchers, and students to share their practical experiences, knowledge, and insight in the evolution, formulation, and implementation of strategies and models for flexible management system to meet the challenging requirements of global business. The objective of the conference is to provide a knowledge sharing platform for dissemination of research and experiential findings through empirical study, qualitative modeling, case studies, new concepts and state of the art studies. The broad areas/subthemes of the event are:

For further details, contact Convener, Indian Institute of Management, Umsawli, East Khasi Hills District, Meghalaya-793018, E-mail: [glogift21@iimshillong.ac.in](mailto:glogift21@iimshillong.ac.in) and [glogift21@gmail.com](mailto:glogift21@gmail.com). For updates, log on to: [www.iimshillong.ac.in](http://www.iimshillong.ac.in) and [www.giftsociety.org](http://www.giftsociety.org).



### **Corrigendum**

The Author’s name and name of the University in the Convocation Address titled ‘*Education is the Key to Sustainable Development*’ published in the University News Vol. 59, No 49 dated December 06-12, 2021, is wrongly written as --‘Pankaj Chandra, Vice Chancellor, Ahmedabad University, Gujarat delivered the Convocation Address at the 67th Convocation Ceremony of Gujarat Vidyapith, Ahmedabad, Gujarat on October 18, 2021’. The inconvenience caused to the Author, Readers and the Gujarat Vidyapith is deeply regretted. The actual Convocation Address delivered by Prof. Pankaj Chandra in Gujarat Vidyapith will be published in one of the forthcoming Issues.

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# THESES OF THE MONTH

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## SOCIAL SCIENCES

### A List of doctoral theses accepted by Indian Universities (Notifications received in AIU during the month of October-November, 2021)

#### Anthropology

1. Riba, Mibi. **Medical anthropology of Galo Tribe of Arunachal Pradesh with special reference to rural women.** (Prof. H Vokendro Singh), Department of Anthropology, Rajiv Gandhi University, Itanagar.

#### Business Administration

1. Gogulamud, V S Ramakrishna. **Role of Primary Agriculture Credit Societies in Andhra Pradesh with special reference to Krishna District.** (Dr. Talluri Sreekrishna), Department of Commerce and Business Administration, Acharya Nagarjuna University, Nagarjuna Nagar.

2. Renu Bala. **Employability skills of management students: A study of academic and industry perspective.** (Prof. Sultan Singh), Department of Business Administration, Chaudhary Devi Lal University, Sirsa.

3. Varghese, Nijo. **The effect of online visual merchandising on customer responses: A study with reference to online customers of electronic goods in Kerala.** (Dr. Kemthose P Paul), Department of Business Administration & Management, Kerala University of Fisheries and Ocean Studies, Kerala.

#### Commerce

1. Anantkawlas, Tukaram Vithoba. **A study of women entrepreneurs with special reference to Satara District.** (Dr. Sudhir V Mane), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

2. Bhagtiani, Roma Pritamdas. **A study of measures taken for women empowerment in Thane District.** (Dr. B S Gite), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

3. Dagade, Gajanan Prabhu. **A study of online retail marketing and its impact on offline traders of electronic products in Nanded District.** (Dr. S B Adkine), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

4. Dubale, Ganesh Jagannathrao. **A study of consumer satisfaction in hotel industry: With special reference to Marathwada Region.** (Dr. B S Gite),

Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

5. Ghanchi, M Adil Mahebbubhai. **Role of primary housing co-operative in financing rural housing in Mehsana.** (Dr. Bhavesh Lakhani), Department of Commerce, Gujarat University, Ahmedabad.

6. Gholap, Sapna Malhari. **Impact of non-government organization on women socio-economic development of Beed District.** (Dr. D S Yadav), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

7. Gunjan. **De-tariffication in general insurance sector in India: An efficiency analysis.** (Dr. Narender Kumar), Department of Commerce, Maharshi Dayanand University, Rohtak.

8. Jaiswal, Gaurav Kumar. **New economic policy of the Govt. of India and its impact on private sector enterprises: A case study of the Tinsplate Company of India Limited (TCIL).** (Dr. Niranjana Jeswal), Department of Commerce, T M Bhagalpur University, Bhagalpur.

9. Kishan, Satya. **Impact and performance of KCC in Marathwada Region with special reference to Beed District.** (Dr. Chavan Ashok), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

10. Lande, Nilkanth Digaji. **A comparative study of impact of milk production on socio-economic development of farmers in Parbhani and Nanded District.** (Dr. H S Patange), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

11. Patil, Jyoti Mahadeo. **A study of saving and investment pattern of rural inhabitants relating to postal and banking schemes.** (Dr. B S Wankhede), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

12. Rathod, Santosh Premdas. **An analytical study of goods and services tax in Maharashtra.** (Dr. Wankhede B S), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

13. Rokde, Rajesh Dnyaneshwar. **Impact of advertising of FMCG products on rural consumers: With reference to Nanded District.** (Dr. B V Dakore), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

14. Saini, Megha. **Performance evaluation of the public sector enterprises in Haryana.** (Dr. Rajpal Singh), Department of Commerce, Maharshi Dayanand University, Rohtak.

15. Sathyanarayana, Y. **A study of claims management in national insurance company, Karimnagar Division.** (Dr. B D Kompalwar), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

16. Singhal, Saakshi. **Interface between heuristic driven biases and personality traits: A study of individual investor in NCR.** (Dr. Narender Kumar), Department of Commerce, Maharshi Dayanand University, Rohtak.

17. Thorat, Trupti Sandip. **A study of customer relationship management with reference to hospitality industry in Raigad District.** (Dr. P S Sonale and Dr. S A Vibhute), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

18. Wakle, Suryakant Rajaram. **A study consumer behaviour and marketing trends of selected consumer products in Latur District.** (Dr. N B Jadhav and Dr. K B Patole), Department of Commerce, Swami Ramanand Teerth Marathwada University, Nanded.

### **Economics**

1. Sabharwal, Karan. **Comparative trade advantage in India with RCEP countries.** (Prof. B S Prakash), Department of Economics, Indira Gandhi National Open University, New Delhi.

2. Sunitha, A S. **An assessment of social progress in the context of social exclusion: A study of tribal communities in Kerala.** (Dr. D Rajasenan), Department of Applied Economics, Cochin University of Science & Technology, Kochi.

3. Swamy, M Siddalinga. **Production and marketing of maize in Karnataka: A study of Davanagere District.** (Dr. Ravindranath N Kadam), Department of Economics, Kuvempu University, Shankaraghatta.

4. Thoke, Rahul Vithalrao. **An analysis of performance of fish processing industry in Maharashtra.** (Dr. Tawar A T), Department of Economics, Swami Ramanand Teerth Marathwada University, Nanded.

### **Education**

1. Chaudhari, Manubhai Ramanlal. **Comparison of special secondary schools for the divyangs.** (Prof. Ajitsinh P Rana), Department of Education, Dr Babasaheb Ambedkar Open University, Ahmedabad.

2. Joshi, Sunilkumar Ramrup. **Job satisfaction of teachers in relation to their gender, experience, educational qualification and area of school.** (Prof. Ajitsinh P Rana), Department of Education, Dr Babasaheb Ambedkar Open University, Ahmedabad.

3. Loncha, Hemlata Pramji. **Effectiveness of computerized programme on learning of selected units of Hindi subject of standard VIII.** (Prof. Ajitsinh P Rana), Department of Education, Dr Babasaheb Ambedkar Open University, Ahmedabad.

4. Mehta, Kalyani Niranjanbhai. **Work values of teachers.** (Prof. Ajitsinh P Rana), Department of Education, Dr Babasaheb Ambedkar Open University, Ahmedabad.

5. Parmar, Sangeetaben Parshotambhai. **Development and validation of criterion referenced test for unit of concepts of revenue and cost in economics subject of standard eleven.** (Prof. Ajitsinh P Rana), Department of Education, Dr Babasaheb Ambedkar Open University, Ahmedabad.

6. Vaghela, Bhadrasinh Arjunsinh. **A study of awareness and implementation of the Right to Free and Compulsory Education Act, 2009.** (Prof. Jitendra H Pancholi), Department of Education, Dr Babasaheb Ambedkar Open University, Ahmedabad.

### **Home Science**

1. Agravat, Priyanka Narendra Kumar. **Study of the health and nutritional status of the employees of Saurashtra University.** (Dr. N R Dave), Department of Home Science, Saurashtra University, Rajkot.

### **Journalism & Mass Communication**

1. Ghachi, Sahinaben Abdulbhai. **As a print media role of Navjivan in literature and journalism of Gandhiji.** (Dr. Kanti Thesia), Department of Journalism, Saurashtra University, Rajkot.

### **Law**

1. Malik, Aman. **Effect to technological advancement on right to privacy: A critical study.** (Dr. Surender Singh Dahiya), Department of Law, Maharshi Dayanand University, Rohtak.

2. Mishra, Divya. **Interrogating new ways for off loading of pending cases in courts: An issue of judicial**

**reforms.** (Dr. Shashank Shekhar), Department of Law, Dr Ram Manohar Lohiya National Law University, Lucknow.

3. Mukesh Kumar. **Evolution of International Law of Sea: A study.** (Dr. Amit Ludri), Department of Law, Kurukshetra University, Kurukshetra.

4. Preet Singh. **Role of public prosecutor in criminal justice system in India: A critical study.** (Dr. Om Prabha), Department of Law, Maharshi Dayanand University, Rohtak.

5. Rachna. **Trafficking in human beings: Issues and challenges.** (Dr. Anusuya Yadav), Department of Law, Maharshi Dayanand University, Rohtak.

6. Sandeep. **Role of Election Commission of India in free and fair elections: A critical study.** (Dr. Virender Sindhu), Department of Law, Maharshi Dayanand University, Rohtak.

7. Shell. **Right to freedom of speech and expression: A study of emerging trends.** (Dr. Naresh Kumar), Department of Law, Maharshi Dayanand University, Rohtak.

8. Siddiqui, Seema. **Convergence of Jus ad Bellum and Jus in Bello under International Humanitarian Law.** (Dr. Rajneesh Kumar Yadav), Department of Law, Dr. Ram Manohar Lohiya National Law University, Lucknow.

9. Sukhram. **Juvenile delinquency: A critical study of statutory provisions and judicial trends.** (Dr. Badruddin), Department of Law, Maharshi Dayanand University, Rohtak.

10. Vivek Kumar. **Centre state relations and co-operative federalism under Indian constitution: A critical study.** (Dr. Jitender Singh Dhull), Department of Law, Maharshi Dayanand University, Rohtak.

#### **Library & Information Science**

1. Alam, Nihal. **Application of social media in university libraries: A proposed model for Indian libraries based on a study of Anglophone countries.** (Prof. Uma Kanjilal), Department of Library and Information Science, Indira Gandhi National Open University, New Delhi.

2. Arya, Sarita. **Role of web social media in changing information behaviour of teacher's in higher education: With special reference to Devi Ahilya Vishwavidhyalay, Indore Madhya Pradesh.** (Prof. Kishore John), Department of Library and Information Science, Dr B R Ambedkar University of Social Sciences, Indore.

3. Deepak Kumar. **Use and gratification of social media networks by LIS students of universities in selected States of Northern India: A Study.** (Dr. Ashu Shokeen), Department of Library and Information Science, Kurukshetra University, Kurukshetra.

4. Deshmukh, Shivraj Babarao. **Study of college with potential for excellence libraries with special reference to Maharashtra.** (Dr. Kulkarni J N), Department of Library and Information Science, Swami Ramanand Teerth Marathwada University, Nanded.

#### **Management**

1. Anshu. **Impact of macro economic variables on the financial performance of Indian banking sector.** (Dr. Kamlesh Gakhar), Institute of Management Studies & Research, Maharshi Dayanand University, Rohtak.

2. Bijender Singh. **Teachers job satisfaction and work motivation in government polytechnics in Haryana.** (Dr. Mukesh Dhunna), Institute of Management Studies & Research, Maharshi Dayanand University, Rohtak.

3. Buch, Aneri Chetan. **Measuring job satisfaction through life position and time structuring of individuals: An empirical study.** (Dr. Margie Parikh), Department of Management, Gujarat University, Ahmedabad.

4. Jaggarwal, Shiv Kumar. **Women leadership and corporate governance practices in Indian business organization.** (Dr. Satyawan Baroda), Institute of Management Studies & Research, Maharshi Dayanand University, Rohtak.

5. Jethwani, Bharat Jagdish. **Comparative study of sales promotion activity of selected cosmetic companies of selected men's cosmetic products.** (Dr. S G Losarwar and Dr. G P Mudholkar), Department of Management, Swami Ramanand Teerth Marathwada University, Nanded.

6. Jyoti Rani. **Operational risk management: A study of selected banks in India.** (Dr. Jai Kishan Chandel), Department of Management, Kurukshetra University, Kurukshetra.

7. Kamana. **Trend analysis of consumers in modern retail outlets in Delhi NCR.** (Prof. Mohd Tahseen Burney), Department of Management, Al-Falah University, Faridabad.

8. Komal Rani. **Online shopping behaviour of women in Central National Capital Region.** (Dr. Anjali Ahuja), Institute of Management Studies & Research, Maharshi Dayanand University, Rohtak.

9. Lotke, Ganesh Laxman. **A study of supply chain management practices in selected four wheeler**

**automobile companies in Pune District.** (Dr. Biradar B M), Department of Management, Swami Ramanand Teerth Marathwada University, Nanded.

10. Maggu, Payal. **Working capital management and profitability in organised retail sector in India.** (Dr. Ajit Singh Boora), Institute of Management Studies & Research, Maharshi Dayanand University, Rohtak.

11. Mistri, Kinjalkumar Narendrabhai. **Gujarat film industry and preference of cinegoers towards upcoming Gujarati films.** (Dr. Prateek Kanchan), Department of Management, Gujarat University, Ahmedabad.

12. Navita. **Valuation and reporting of human resource: An analytical study of HRA practices in the Indian corporate sector.** (Dr. Ajay Solkhe), Department of Management, Kurukshetra University, Kurukshetra.

13. Pardeep Kumar. **Modeling service quality and customer satisfaction.** (Dr. Hema Gulati), Institute of Management Studies & Research, Maharshi Dayanand University, Rohtak.

14. Patil, Bharat Prataprao Chavan. **Analysis of factors influencing social responsibility amongst students: A study.** (Dr. Safia Farooqi), Faculty of Management, Dr D Y Patil Vidyapeeth, Pune.

15. Phogat, Steffi. **Customer satisfaction and loyalty in Indian health care services: A study of selected organisations in National Capital Region (NCR).** (Dr. Amit Kumar Singh), Department of Hotel and Tourism Management, Maharshi Dayanand University, Rohtak.

16. Ritu. **Challenges and prospects of women entrepreneurship in Haryana.** (Dr. Seema Singh), Institute of Management Studies & Research, Maharshi Dayanand University, Rohtak.

17. Saral, Arun Kumar. **A study on financial inclusion and management among Bhil Tribes in Jhabua District of Madhya Pradesh.** (Prof. R K Shukla), Department of Management, Dr B R Ambedkar University of Social Sciences, Indore.

18. Sharma, Aditya Kumar. **A study of implication of human resource management strategy for facilitating employee satisfaction strategy for facilitating employee motivation.** (Dr. Ritika Moolchandani), Department of Management, Bhagwant University, Ajmer.

19. Sharma, Ravi. **Critical analysis of business growth by modern marketing and promotion strategies on adoption of smart phone in select Indian market.** (Dr. Ritika Moolchandani), Department of Management, Bhagwant University, Ajmer.

20. Sharma, Shiwangi. **A study of employee retention strategies in start-up ventures.** (Dr. Nandini Srivastava), Faculty of Management Studies, Manav Rachna International Institute of Research and Studies, Faridabad.

21. Vashishth, Preeti. **Impact of training and development on the employee's efficiency and effectiveness: A study of BPO firms.** (Dr. Karamvir Sheokand), Institute of Management Studies & Research, Maharshi Dayanand University, Rohtak.

22. Yugma, Rattan Khanna. **Trans inclusion at work place-issues and challenges.** (Dr. Vilas Kulkarni), Department of Management, Gujarat University, Ahmedabad.

### **Physical Education & Sports**

1. Gopi, Ajith. **A study of the relationship between the perceived teachers nonverbal immediacy, academic motivation, affective learning and teachers performance of physical education students of Kerala.** (Dr. Gopal L Moghe), Department of Physical Education, Swami Ramanand Teerth Marathwada University, Nanded.

2. Kota, Sridharkumar. **A retrospective study on injuries prevalence in competitive volleyball players.** (Dr. Sinku Kumar Singh), Department of Physical Education, Swami Ramanand Teerth Marathwada University, Nanded.

3. Patil, Sunil Hanmantrao. **Examining the effects of socio-economic status and social psychological characteristic on the performance and participation in the players of Indian major games.** (Dr. U D Kodgire and Dr. B P Jadhav), Department of Physical Education, Swami Ramanand Teerth Marathwada University, Nanded.

4. Vasudev, Namjoshi Dhaval. **Comparative study of anthropometric and physical fitness variables between CBSE & GSHSEB students of Gujarat State.** (Dr. R J Chaudhari), Department of Physical Education, Gujarat University, Ahmedabad.

5. Yerawar, Kiran Kishanrao. **A study of personality, emotional maturity and anxiety of inter collegiate kabaddi players in relation to age, gender and area.** (Dr. Gomchale M S), Department of Physical Education, Swami Ramanand Teerth Marathwada University, Nanded.

### **Political Science**

1. Rakesh Kumar. **Right to Information Act in Haryana: A comparative study of the departments**



**of health and education in the District of Rohtak and Bhiwani.** (Dr. Rajendra Sharma), Department of Political Science, Maharshi Dayanand University, Rohtak.

2. Shalu Devi. **A study of India and Afghanistan relationship and provide a framework for the betterment both the nations.** (Dr. Shashi Bala Singh), Department of Political Science, Bhagwant University, Ajmer.

3. Tonde, Babasaheb Sakharam. **Role of local political elites in the process of political socialization: Special reference to members rural local self institutions in Beed District.** (Dr. Khandve E T and Dr. Andhale B V), Department of Political Science, Swami Ramanand Teerth Marathwada University, Nanded.

### Psychology

1. Luhar, Urmilaben Manubhai. **A comparative study of self efficacy emotional maturity and locus of control among police employees.** (Dr. M P Shukla), Department of Psychology, Saurashtra University, Rajkot.

2. Manju Rani. **A study of the Rorschach indices in relation to their corresponding psychometric measures.** (Dr. Umed Singh), Department of Psychology, Kurukshetra University, Kurukshetra.

### Public Administration

1. Rajwanti. **Health administration: A study of organization and working of Pandit Bhagwat Dayal Sharma University of Health Sciences, Rohtak.** (Dr. Shashi Kala Mehra), Department of Public Administration, Maharshi Dayanand University, Rohtak.

### Social Work

1. Bairagi, Sonal Gurudas. **A study of work culture and social security of N G O workers of Nashik, District of Maharashtra.** (Dr. M A Kapurderiya), Department of Social Work, Swami Ramanand Teerth Marathwada University, Nanded.

2. Gondliya, Hina Ishwerlal. **A study on problems of female workers in industrial sector.** (Dr.

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