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In This Issue

Digital Education: Will it Help Overcome Post COVID-19 Concerns and Improve Quality of Higher Education?

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We are living in extremely unsettling times when the corona virus has shattered the world and caused existential uncertainty for all life forms. This is in spite of the fact that the fight is between the finest of all natural creations and the non-living microscopic entity. The number of infected people and loss of precious lives continue to increase with every passing day. With nearly nine million infections and half a million dead, the situation is unprecedented since the Spanish flu in 1920. This is happening despite the fact that people are staying at home or observing mandatory health requirements while going out. Alternatively, they should develop herd immunity or medication/vaccination becomes available. The medical researchers are doing their best to develop cure against the virus and hoping to succeed by the end of 2020. But non-availability of reliable medication as of now is inducing psychic anxiety; one may be justified in saying that health crisis is staring the world community in its face. Moreover, due to loss of jobs, the poor are failing to support themselves or their families and reportedly 1 per cent of entire human population had to migrate. This led to spread of infections, caused economic crisis of unimaginable dimensions due to substantial decline in demand, trade and manufacturing. These undesirable developments threaten to undo growth and development achieved with several decades of hard work, though national governments are coming out with economic packages to check economic decline.

It is said that education liberates from mental biases and inhibitions and makes us humble, dynamic, enlightened and empowered. It enables teachers to build trust and synchronization with their learners by igniting the lamp of knowledge in them though they are only a few years behind. The world is not going to be same again post-COVID, as new normal is emerging rather, emerged. In such a situation it would be pertinent to quote Alvin Toffler: "*The illiterate of twenty first century will not be those who cannot read and write but those who cannot learn, unlearn and relearn*".

COVID-19 and Higher Education

It is common knowledge now that in the wake of COVID-19 pandemic, millions of students and teachers from across the globe have been driven out of their university campuses to the safety of their homes. Both these groups are grappling with the new norm of COVID-enforced tech-mediated teaching-learning for lack of training in pedagogy, instructional design and technology-oriented learning

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outcomes. At Usha Martin University, Ranchi, which was recently conferred E-Lead certification by QS I-Gauge for complete e-readiness, our experience showed that nearly half of the learners, who came from rural families either had no access to e-learning resources or their attitude towards this new practice was not very affirmative.

It is no exaggeration to say that challenges of COVID-19 pandemic in delivery of higher education being faced by public as well as private providers in India are herculean. Some of these include: Will COVID-19 pandemic prove watershed for higher education; newer models and mechanisms based on technology take over delivery of higher education? Will digital education, which is being promoted by almost everyone, including MHRD, be the new normal, i.e., mark the beginning of end of the chalk and talk method via technology mediated academic transactions? Can digital education as practiced in COVID-19 time prove a blessing in disguise and improve the quality of academic transactions as well as assessment? Will a few universities monopolize higher education by themselves or in collaboration with tech-companies like Google, Face Book, TCS, Infosys; etc and brick-and-mortar universities, particularly newer ones go out of business? We understand that (i) technology is definitely going to alter the landscape of higher education, (ii) partnerships between tech corporate and progressive universities should rule and (iii) GER, a concept widely used as a measure of enrollment in higher education institutions should increase significantly and democratise access.

The developments of past few months have put higher education in a state of flux; it is in fact undergoing tectonic shift right now, though it has been in deep crisis for long. But the issue pertaining to quality is most relevant; we have islands of excellence in the country but these are not many; general impression is said to be that of mediocrity (NKC, 2009). That is why no single institution in the country, including our much hyped premier institutions such as India Institute of Technology (IITs), Indian Institute of Management (IIMs) and leading central universities, finds place in the top 100 higher education institutions of the world. The reasons are many (Garg, 2015, Ahmed and Garg, 2015) ranging from non-availability of 'teachers/researchers by choice' to funding and politico-bureaucratic indifference. The latter part is well illustrated by non-implementation of Kothari Commission recommendation that 6 per cent of GDP should be spent on education, though

accepted by the then central government in 1966 (GoI, 1966). The successive governments have paid lip service to education and even in the Union Budget 2020, only 3.2 per cent was allotted to education. And of this, less than 1 per cent will go to higher education. The technology-mediated education is the fourth stage in the development of education; the other three stages evolved over 2000 years of civilization. (In the Gurukula system (1.0) practiced widely in ancient India, education was received at the feet of the *gurus* in their *ashrams* far removed from urban dwellings. Usually the *guru* was endowed with cosmic powers and imparted instruction in spiritual as well as knowledge domains. The *Academy of Pluto* and the *Lyceum of Aristotle* were akin to this model. As knowledge grew, disciplines and specializations came into existence and no scholar, howsoever tall, could claim to be master of all. Moreover, as the number of learners increased, the teacher-disciple model came under stress and gradually paved way for the classroom system (2.0). In the course of time, it became the mainstream system of education the world over and is now referred to as the formal or conventional system, where education is imparted in face-to-face (F2F) mode. As such, the F2F system proved extension of the teacher-disciple model and has been performing the functions it was designed for. This system is essentially institution-centric.

The formal system is inherently inflexible in terms of pace, place and period of learning, entry requirements and capacity, etc. Such factors combined to restrict access to equitable opportunities for higher education to all. When socially, economically and geographically disadvantaged groups began to pressurize political leadership for providing an egalitarian higher education system in the country, provisions for part-time own-time education were created as supplementary to F2F mode. This led to Open and Distance Learning (ODL) system in its incarnation as correspondence system of education. This was designated as third stage (3.0) in the development of education.) The ODL system, which lends itself naturally to technology, proved a defining milestone for emergence of digital education and enrolls every third student in higher education.

Digital/Online Education

Normally, the terms digital education and online education are used interchangeably as these take place through electronic means starting from little media (radio, audio) to local area networks (LAN) and Internet. But there is subtle difference

between them. Digital learning is a wider term encompassing learning through a large range of digital technologies—computers, mobile devices and the Internet while online education is learning using the capabilities of only the Internet, that is, it is web based. Moreover, online learning can be synchronous like online chatting, zoom conferencing or online networked teleconferencing as well as asynchronous like email. In the COVID-19 crisis, digital industry is attempting to convince/lure teachers in higher education institutions with arguments that mastery of digital tools and techniques will help them stay in front. But before adopting the change, one must ask: Is the digital revolution working and are we at a 'transformative moment'? While available data is not enough to be relied upon, the answers to both of these questions are still open in our context. It is however worth speculating on relevant realities, trends and emerging scenarios.

Post-COVID-19 Concerns

It is widely believed that corona is here to stay for long and digital education will be the new normal. But most conventional purists/conservatives among educators/intellectuals and administrators believe that impact of COVID-19 crisis shall be temporary and face-to-face (F2F) system of education, which evolved over centuries and gave the society great thinkers, scientists and technologists, will survive the crisis. Yet higher education providers visualize many concerns in the post-COVID era. This notwithstanding, innovative entrepreneurs see many of these concerns as opportunities to excel and march ahead of the mob. We now consider some of these.

Availability Versus Accessibility

It is well accepted that there are massive inequalities in the provision of available higher education in the country. Leading intellectuals believe that online mode can be a great equalizer as far as equitable access to higher education is concerned. Advocates of online learning argue that smart phones can be used for online instruction since their penetration has increased tremendously in the country since 1990s. But in practice, this argument does not hold good as the ground reality is not very rosy; many students from poor families living in rural villages and urban slums do not have access to basic devices such as smart phone and laptop computer. Moreover, not all universities can support learners with these devises or arrange financial help through bank loans. Also, these institutions lack necessary

technological infrastructure. This implies that for the success of digital education, the state and/or central governments should pitch in with financial support to address these concerns.

Our experience at Usha Martin University, Ranchi shows that students are not very enthusiastic about online education; many of them were machine shy. Also, about 50 per cent students had no access to smart phones and therefore reach was seriously hindered. While this data is only indicative, we observed that undergraduate students seemed more unsatisfied; some of them even avoided participation in group activities as they were more comfortable with and therefore preferred face-to-face interaction with their teachers and fellow students.

In India, private providers, who cater to about 70-80 per cent of higher and professional education, are jostling with each other as to what would they do next year if students do not return to the campuses. Their worries are being compounded further by the fear of parents who are unsettled about (issues of health and hygiene of) their wards travelling miles away from home. There is a lurking fear that Covid pandemic can cause profound disruption in higher education campuses and provide impetus to technology mediated education through steep jump, though there are reasons for the contrary to be true? COVID-19 has exposed how fragile the current private higher education system is. This status is essentially obtained as a result of continuously declining public funding for higher education, apart from accelerated internationalization and ever growing craze for foreign degrees in the society despite loud calls for being 'vocal about local'. However the pandemic has made it amply clear that innovations and quality assurance are inevitable for sustainability.

We are witness to COVID-19 forced sudden shift of teaching-learning to online mode to stem the disruption. With little time for arranging capacity building through faculty development programmes in online pedagogies, most higher education institutions started online teaching without taking capacity building measures. The situation turned towards worse as faculty members were in general not enthusiastic towards use of technology in delivery of education and online teaching in particular since a significant majority (i) had no prior experience, (ii) lacked enthusiasm to learn new methods and techniques and (iii) were not convinced about the quality of delivery and/or assessment. However, it is only proper to give

them benefit of doubt that they did not wish to swim against the tide without adequate preparation. The same is true of students also. And as a matter of fact, both the teachers and the learners should be trained to handle this methodology.

It would be pertinent to emphasize here that COVID promoted online learning almost spontaneously; distance educators failed to achieve this feat though they had been trying since the last decade of the century gone by. Due to resistance of regulating bodies, including University Grants Commission (UGC) and All India Council for Technical Education (AICTE), most policy level changes remained superficial. (Interestingly, now UGC is said to be modifying its guidelines and students can enroll for double degrees simultaneously; online being one of these.) In the past, but for a few exceptions, most institutions that offered e-education replicated ODL processes with some modern technological tools as an 'experiment'. Even under certain government schemes, the classroom lectures were delivered as part of 'blended learning'. However, no effort has ever been made for training the teachers and the learners in the pedagogy of online learning and one may be justified to say that the quality of online education is at best equal to that of classroom teaching.

Quality and Digital Education

The dictionary meaning of quality is 'degree of excellence' and 'superiority in kind'. It results from all round intelligent effort and is one of the most important issues in present day higher education eco-system. However, perceptions of leading educationists about quality vary considerably; some consider it as fitness of purpose and conformance to standards (Green, 1994) while others look at it as value for money, relevance to the world of work and perfection and consistency in performance (Power and Panda, 1995), depending on the stakeholder as well as institutional mission. When quality is perceived as a continuing march towards excellence, it becomes an important attribute of scholarship in the system. Quality necessitates provisions of rich environments for active learning and inculcation of skills such as critical thinking, independent learning, working in a team, problem solving, etc. Quality assurance in learner support is key determinant for sustainable digital learning. Moreover, digital education helps in better time management.

But as of now, quality of education offered through digital mode faces a serious challenge from lack of 'interaction' due to remoteness of the learner, newness of the methodology and lack of training. Moreover, machine limits reflexes, responses and spontaneity. However, tech-savvy educators are convinced that netizens would be comfortable with digital learning and quality of digital education will be ultimately determined by our ingenuity. But most conventional purists/ intellectuals are of the view that face-to-face (F2F) system of education, which evolved over centuries and gave the society great thinkers, scientists and technologists, will remain mainstream system. We are of the considered view that digital education will democratize higher education.

Issues regarding genuineness, applicability and reproducibility of grades are yet to be settled to the satisfaction of skeptics in academia. On-line assessment therefore remains an unsettled point. Though tech-companies and a few free-lancers are supposedly offering complete solutions, it may not be advisable to be very optimistic about digital learning so soon. This is in spite of the fact that the regulators are recommending on-line examinations due to concerns about safety of various stakeholders. Academic Councils of some universities, following UGC guidelines, have decided to do away with end of semester written examinations in favor of online quizzes and mid semester test grades.

Every institution has to reposition its offerings regularly so as to assess rapid pivot to online education for abundant caution since it enforces fundamental shift in teaching-learning paradigm from teacher-centric to learner-centric education embedded with adequate learner support.

Ideally, every institution practicing online education must support efforts of the teacher in front of the screen by developing quality print and e-materials, benchmark these and share with the learners at the beginning of the session. A single institution may find itself unequal to the task. Therefore, it would be advisable to forge partnerships with or form consortia of universities under the guidance of a Task Force comprising members from all partnering institutions. This will need support of the management of all participating institutions.

As restrictions ease, educational institutions will be faced with the option of retreating to classroom based teaching. Due to COVID period, the issue of safeguarding the health and hygiene of learners, teachers and the staff involved in delivery of education

in F2F teaching-learning or while in transit remains an extremely sensitive issue for higher education providers. As of now, everyone seems to be in a state of confusion as to how a contextualized system can be put in place since taking preparedness measures are absolute must.

Opportunities

Despite sudden rise in online education and various challenges it faces, one must not construe that it is impractical due to lack of 'engagement' and requirements of large costly band width. Connectivity issue apart, leading international experts including former President of COL Sir John Daniel, are of the considered opinion that online education should not have been an overnight solution. Yet for a populous but software-forward country like India, blended/ digital education seems to be a viable option, provided faculty resistance is overcome through incentives. In fact, digital education provides us ample opportunities, depending on how institutions in developing and less developed nations make use of the accumulated experience. Digital education could catalyze our offerings if made a part of institutional mission with thorough planning for reliable infrastructure and crystallized vision for learner support. The Open Educational Resources could however be used as plug and play devices in the larger scheme of digital education. For instance, the use of IT in teaching-learning and in research can help forge partnerships with international experts, revise curriculum, adopt best practices and make up for lack of availability of resources. Indira Gandhi National Open University brought about knowledge revolution and cultural synergies through Pan-African education project of Govt. of India. Masters level programmes were put on offer and availed of by students in many African countries in the period 2005-and a risk tolerance to nurture learners. This led to availability of high quality education at affordable cost, standardization of curriculum, "internationalization at home" and saving outflow of national finances. However, dedication towards online learning will require consistent will to nurture learners with skills in artificial intelligence, digital marketing, cyber security, bioinformatics, retail and supply chain management, etc necessary for 21st century employment. To conclude, since enrolment in higher education continues its upward trajectory, higher education institutions need to invest in digital education and online learning adequately.

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Teacher Empowerment: A Construct Analysis

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Empowerment has been viewed differently by research experts of diverse disciplines, but no apparent and brief definition of empowerment exists so far in the context of Education. So it is essential to understand the notion of Teacher Empowerment from the perspective of an educationist. Teacher Empowerment is a very fundamental construct for organizational outcomes and effectiveness. Before discussing the construct of Teacher Empowerment, it is very vital to know the connotation related to this construct and also it is essential to comprehend meaning, nature, process and the factors leading to empowerment. In this paper an endeavor has been made to explain the concept of teacher empowerment with the help of diverse models of empowerment following the basic preface related to it.

Why Teacher Empowerment?

Teaching is always measured to be a three way process where communication occurs between the teacher, students and the objectives. The spirit of learning always lies in the enormity of interaction between the teacher and the student. The teacher in this context has to play a very significant and vital role. Teacher's rendezvous in school based programs and community expansion activities are imperative to bring awareness in the society. Teachers are anticipated to execute multiple activities within and outside the classroom. As a result none of the innovations have an effect on basic school reform due to top-down orientation which have detached the persons accountable for execution of the innovations from the initial decision making process. In the present circumstances also the important institutional decisions which can affect a teacher's work are managed by superiors (administrators and policymakers) in the traditional hierarchical educational structure. In our education system everything starting from hiring of teachers, scheduling, and decision regarding selection of course books, curriculum and professional development is often in the hands of others instead of the teachers. The power is in the hands of other but teachers are held responsible for the failures in their classes, they feel very much hassled as they are asked to give better results without asking for the autonomy to deal with teaching-learning process. To whom is the teacher responsible- the parents, the administrators of the schools, the students, and the profession? And for what is the teacher accountable for? Teachers react in variety of ways. The expectations are beyond the capacity and sometimes it becomes burden to the teachers. For any kind of reform in education, its basic resource component is a teacher. *Teacher is one who leads us away from the darkness of ignorance and open our eyes through the healing touch of knowledge* - says a Sanskrit verse. A belief by teachers that their expertise of teaching and learning matters and is considered very important factor in decision-making and it can motivate them to connect to their schools in meaningful and powerful ways. This association can help improve the retention of teachers in their classrooms and success of the students they teach. As noted by Richard Ingersoll (2003) in his book 'Who Controls Teachers' Work? Power and Accountability in America's Schools, "Those who are entrusted with the training of this next generation are not entrusted with much control over many of the key decisions in their work." He further barbed out that, "The result of this disenfranchising of teachers will be schools that deprofessionalize and demotivate teachers". Thus, when teachers are involved in those decision making processes which have an influence on them, they enjoy teaching, impart knowledge and skills to their children with more enthusiasm, handle their classrooms more effectively, and comprehend their role in the community, we can say that they feel highly empowered and also their student's achievement tends to enhance.

Teacher Empowerment-An Overview

In the inception empowerment was seen as an approach used by the weaker individuals of the society to surmount the domination and tight control of powerful troop of people on them. Therefore, it would not be erroneous if we say that the notion of empowerment has emerged as a result of the direct answer of powerlessness and social forms that subsidized to supremacy or domination. Adjoining to

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this, empowerment can also be seen as the obsession of comprehending, recognizing, and characterizing processes through which human beings create possible choices to conquer domination through both personal and organizational change (Conger & Kanungo, 1988). Empowerment comprises of organizational processes and structures that increases member involvement and advances goal achievement for the organization. In other terms, empowerment can be viewed as a process of encouraging the organizational results and effectiveness (Perkins & Zimmerman, 1995). At present, the notion of empowerment has matured into many structures, evolving from the employee involvement and participative decision making approach into the contemporary empowerment prospect. The belief behind the notion of empowerment is to provide the workforce with more degree of flexibility and maximum freedom to make decisions regarding their work. Through empowerment, people are motivated to make certain decisions without consulting the authority and to which organizational dynamics are started at the bottom (Greasley et al., 2004). Power is also said to be readjusted by those who are superior in position to those who are at lower position. When empowerment prevails in organizations, the individuals within that organization tend to perceive their own ownership on their work and they will change completely their particular feelings towards their accountabilities and satisfaction to their jobs. Having this in mind, the conception of empowerment has also subsidized to the development of focus on research in specially the educational settings.

A teacher's sense of empowerment in educational setting represents an essential variable when we talk of effective school movement under comprehensive school improvement efforts. *Short and Rinehart (1992)* have faith in the fact that school improvement will happen if teachers are made active participants in decision making processes of schools. Keeping all this in mind, teacher empowerment needs to be clearly described as it is a difficult construct. *Short (1994)* characterize empowerment as a perception of individuals where they feel competent enough to think of their own growth and also feel capable to solve their problems, and "Empowered individuals believe they have the skills and knowledge to act on a situation and improve it". Researches indicate that the construct of teacher empowerment is very crucial factor for the effective organizational dynamic in schools.

The notion of empowered teachers within a school community harmonizes the use of independence and self-sufficiency to boost up the teaching and learning process.
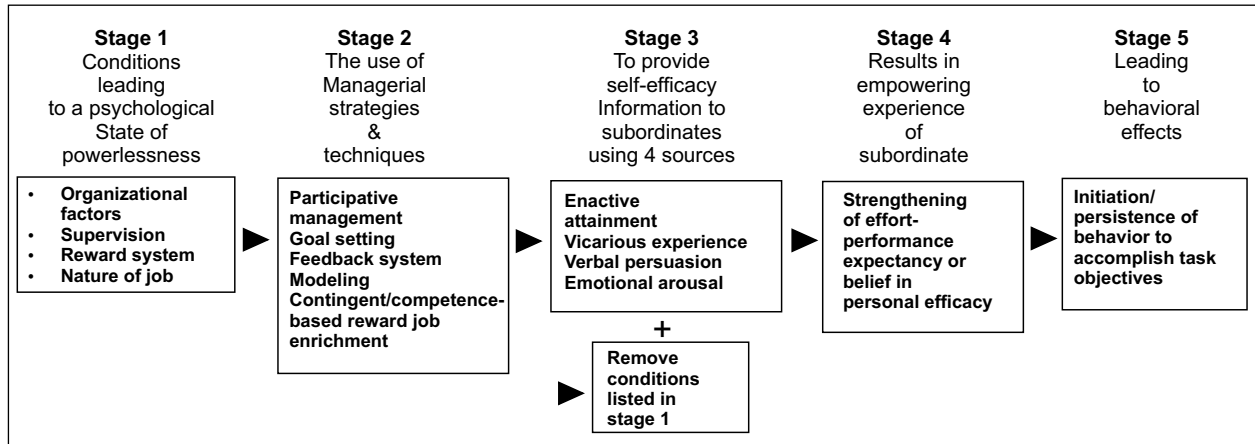
Empowerment-As Perceived by Different Models

There had been several researches in past where construct of teacher empowerment has been developed using different models. Some of these models are discussed.

Conger and Kanungo's Empowerment Model

The research by Conger and Kanungo (1988) is generally considered as a dawn for literature on psychological empowerment. They took the initial steps to chastise the approach to empowerment which was only focused on division of power and delegation of authority. Bandura's (1997) self- efficacy theory was the foundation of Conger and Kanungo's approach towards empowerment. Self-efficacy theory identifies that people who have strong belief in themselves and think that they are capable, can set more challenging goals (Bandura1997; Locke and Laham 1990). Conger and Kanungo (1988) described empowerment as "a process of enhancing the feelings of self-efficacy among organizational members through the identification of conditions that foster powerlessness and through their removal by both formal organizational practices and informal techniques of providing efficacy information". Conger and Kanungo (1988) identified five stages while "explaining the process of empowerment: (a) Conditions leading to a psychological state of powerlessness which include organizational factors, reward system, supervision and nature of job, (b) The use of managerial strategies and techniques like participative management, job enrichment, feedback system, goal setting, competence based reward, modeling, (c) To provide self-efficacy information to subordinates using four sources like enactive attainment, vicarious persuasion, vicarious experience and emotional arousal till they overcome the state of powerlessness, (d) Results in empowering experience of subordinates were the sub-ordinates are empowered, (e) Leading to behavioural effects which result in accomplishment of task" (Figure-1).

In the first stage four main conditions are determined leading to a psychological state of powerlessness. The first condition involves organizational factors such as access to significant

Fig.1: Conger and Kanungo's Model

Stage 1 Conditions leading to a psychological State of powerlessness	Stage 2 The use of Managerial strategies & techniques	Stage 3 To provide self-efficacy Information to subordinates using 4 sources	Stage 4 Results in empowering experience of subordinate	Stage 5 Leading to behavioral effects
• Organizational factors • Supervision • Reward system • Nature of job	Participative management Goal setting Feedback system Modeling Contingent/competence-based reward job enrichment	Enactive attainment Vicarious experience Verbal persuasion Emotional arousal + Remove conditions listed in stage 1	Strengthening of effort-performance expectancy or belief in personal efficacy	Initiation/ persistence of behavior to accomplish task objectives

information, labour problems, accessible equipment within the organization, and technological changes. The second condition contributes to the supervisory style like high control, some control and non-controlling and with the implementation of management techniques like goal setting, modeling, participative management etc. employees can lower the feeling of powerlessness they experienced in the first stage. The third stage is the reward system, here the employees can use the techniques given by Bandura (self efficacy can be attained by using enactive attainment, vicarious experiences, verbal persuasion and emotional arousal) to remove the conditions of powerlessness. The last fourth stage deals with the job design such as lack of role clarity, lack of meaningful goals etc., if the employee uses techniques given by Bandura in third phase than they will also make employees feel empowered in this stage also. The empowering experience in the fourth stage leads to behavioural effects of subordinates. Thus the subordinates are facilitated and their self-efficacy is supposed to be enhanced. The initiation and persistence of behaviour makes it easy to accomplish the objectives.

A Cognitive Model of Empowerment

Thomas and Velthouse (1990) stated that empowerment is a multifaceted notion and can not be harmoniously described in single dimensional concept like self-efficacy; it is a complex construct and needs to be understood properly. They explained empowerment as a set of cognitions that supports to develop an active-orientation to one's work. They set forth a cognitive model of empowerment. In this model, they suggested four psychological cognitions or task assessment that adds to a person's intrinsic motivation towards a task. Thomas and Velthouse"s

(1990) cognitive model was different from Conger and Kanungo"s model in three different ways. "(1) the empowerment is defined as intrinsic task motivation, (2) Task assessment has been identified in which self efficacy is only one of the four cognitions, (3) An interpretive perspective is given to empowerment". The four psychological cognitions of Thomas and Velthouse"s (1990) model are impact, competence, meaningfulness and choice. Thomas and Velthouse (1990) identified six key variables that have an impact on these cognitions are environmental events, global assessments, interpretative styles, task assessments, behaviours and interventions.

According to Thomas and Velthouse (1990), "Impact is the degree to which behaviour is seen as 'making a difference' in terms of accomplishing the purpose of the task (Thomas and Velthouse, 1990)". "Competence is the degree to which a person can perform his or her job efficiently when he or she tries (Thomas and Velthouse, 1990)". "Meaningfulness is the value of a work goal or purpose. It involves the individual's intrinsic caring about a given work (Thomas and Velthouse, 1990)" and "Choice involves causal responsibility for a person's actions". Thomas and Velthouse (1990) describes the influence that environmental factors such as job design, leadership, reward systems and delegation have on the feeling of empowerment. It is the person's decision in initiating and regulating his own actions (Deci, Connell and Ryan, 1989)

Spreitzer's Model of Empowerment

Adopting the Thomas and Velthouse model as basis, Spreitzer (1995a) operationalised it by cultivating a scale to quantify the four components of empowerment. Spreitzer renamed meaningfulness

cognition to meaning   and choice cognition was renamed to self-determination. Spreitzer (1995a) administered a study in an industrial firm and an insurance company. She identified that the four dimensions of psychological empowerment, namely impact, meaning, self-determination and competence, combine together to constitute an overall concept of psychological empowerment which further produces managerial effectiveness. She also discovered that if any one dimension is not present it decreases the effect of empowerment but it will not totally wipe out the overall effect of empowerment perceived. Similarly Spreitzer et al. (1997) stated that one dimension of empowerment itself was not correlated with organizational outcome such as satisfaction, effectiveness, and low job-related strain. They stated that if an organization wants to achieve its outcome such as satisfaction, effectiveness, and low job-related strain the employee must experience all the four dimensions of empowerment. To assure that these four dimensions actually captured the significance of empowerment, Spreitzer (1997) reviewed the interdisciplinary literature on empowerment, drawing various aspects from psychology, sociology, social work and education. She found wide support for these four dimensions of empowerment across the literatures. Based on these results, she further polishes these four dimensions—Meaning, Competence, Self Determination and Impact.

Meaning

Meaning involves a fit between the needs of a person's work role and his or her beliefs, attitudes, values and behaviours. It is the value of work goal and purpose as perceived by the individual in relation to his own personal mission and expectation (Sprietzer, 1995b; Brief and Nord, 1990; Hackman and Oldham, 1980).

Competence

Competence is the degree to which a person can perform task activities skillfully when he or she tries (Thomas and Velthouse, 1990)". "When the self-efficacy of an individual is high, they will be more committed in achieving difficult goals, they will be more determined to succeed when they fail to achieve a task, and will try hard to achieve greater performance levels (Goodale et al., 1997).

Self-Determination

To be self-determining means to experience a sense of choice in initiating and regulating one's own action (Deci, Connell and Ryan, 1989)". Spreitzer (1995b) defines "self-determination as autonomy in performing one's job and the ability to choose how to behave in various job related situations (Spreitzer, 1995b).

Impact

Impact is the extent to which one can influence events in an organization and work outcome and how far an individual believe that he/she can influence the strategic output, management and operation in the workplace (Spreitzer, 1995b; Ashforth, 1989). It is the belief that individuals can influence the system in which they are embedded (Mishra and Spreitzer, 1998).

These dimensions adds collectively to a state of psychological empowerment (Spreitzer, 1995a). Spreitzer (1995a) also added that the absence of any single dimension will dimnishes the overall extent of empowerment. Similarly low rating in any dimension will also reduces the overall empowerment. Therefore, higher ratings in all the four dimensions are required to assure a high level of empowerment (Lee and Koh, 2001). Spreitzer, Kizilos and Nason (1997) state that an "individual needs to experience all four components of empowerment for both the personal and organizational benefits to occur".

Menon's View of Empowerment

Menon (1999) has put forward a completely new set of dimensions. He explained the psychologically empowered state as a cognitive state represented by a sense of perceived control, perception of competence and internalization of goals. Menon (2001) conveyed that psychological empowerment is a psychological state which is quantifiable. According to him psychological empowerment is crucial because of different reasons. First, even though organizations proposes policies and practices to empower its employees, the true benefits of empowerment can be obtained only if the employees actually perceive or experience empowerment i.e. the psychological state of empowerment. Second, while there are many actions that could be considered empowerment, the most apt among them is to concentrate on the psychological state of the employee. Third, psychological empowerment acts as a mediator between the empowerment practices and behavioural and other outcomes like job satisfaction. The three dimensions that capture this conceptualization of psychological empowerment subsequently derived

are Perceived Control, Perceived Competence, Goal Internalization.

Perceived Control-It includes belief about authority, availability of resources, autonomy in decision making, autonomy in the scheduling of work and performance of work etc. This has a similarity to the 'choice' dimension of Thomas and Velthouse's model (1990) and 'self- determination' in Spreitzer's models (1995a).

Perceived Competence - It is defined as belief in one's capabilities to meet given situational requirement. It reflects role-mastery which not only includes accomplishment of assigned task but also handling non-routine role related situations.

Goal Internalisation - It is defined as feelings of significance, community and enjoyment and ownership of organisational goals. Menon (2001) claims goal internalisation is a unique feature of this conceptualization. It has similarity to the meaning dimension put forward by Spreitzer (1995a).

Literature Review on Teacher Empowerment

Various dimensions of teacher empowerment as postulated by different researchers are discussed in this section. Many researches in past has been done to identify empowering issues in school settings *(Short, Greer, and Michael, 1991; Maeroff, 1988; Lightfoot, 1986)*. The concept of empowerment has got attention due to changing conceptions of reform and leadership in organizations and in various industries and sectors including education. The definition and meaning of the term empowerment is still diverse and ambiguous in spite of its being very popular in various organizational settings. In education, empowerment as a leadership and reform approach have its foundation on the belief that the organizational effectiveness is increased by participative decision making by teachers related to the school issues. Recently, research has defined this empowering process according to (a) types of decisions in which teachers are empowered to participate *(Duke & Gansneder, 1990, Rice & Schneider, 1994)"* and (b) actual processes and contexts that engage teachers in those decisions *(Rinehart & Short, 1994; Short, 1998; Short & Greer, 1997)*. Specifically, research suggests that teacher empowerment depends on teacher involvement in decision-making (an essential dimension of empowerment), but for that involvement to be meaningful, two conditions are essential. First, the decisions must concentrate on the areas important to teachers, such as problems related directly to teaching and learning. Second, teachers must perceive that their participation actually influences the decisions made.

Thus, in the literature, the conceptual continuum of teacher empowerment has definable endpoints. On one extreme, the concept of teacher empowerment is viewed as where power is handed over to classroom teachers by someone above them in the school's hierarchical structure usually by the principal. On the other hand, teacher empowerment is seen as empowerment through professional growth and knowledge. Maeroff *(1988)* identified the tactics for empowering teachers that assumed the interference of an external agent, "…teachers should be raised in status, made more competent at their craft, and given entry to the decision-making process. Maeroff also found knowledge, access to decision-making and status as three key areas essential for teacher empowerment. Yonemura *(1986)* described it as the satisfaction and empowerment which derive from the adventures of minds that are freed to think. She explained that teachers can be empowered by their participation in the invention of the curricula, ongoing peer relation, and child study. In an article titled, On Goodness in Schools: Themes of Empowerment, Lightfoot *(1986)* stated, "Empowerment refers to the opportunities a person has for autonomy, responsibility, choice, and authority". Sprague *(1992)* identified teacher status as an essential element of empowerment and found five qualities of teacher's work that result in their lack of status/ power: (i) the feminization of teacher's work, (ii) the technologizing of teacher's work, (iii) the deskilling of teacher's work, (iv) the intensification of teacher's work, (5) the privatazition of teacher's work.

Lieberman & Miller *(1990)* wrote, "The authentic inclusion of teachers in school wide decision- making depends as much on principal's attitudes and beliefs as on their (teachers) possession of certain process skills. These authors further suggested that the success of teachers in school restructuring depends on teachers assuming two new roles, colleagueship and leadership". Rapport *(1987)* identified self-efficacy, self-esteem, and casual importance as elements of empowerment. In a research on empowerment in communities he found that an individual's sense of empowerment was directly related to the individual's sense of involvement in community. Rapport explained

the notion of empowerment as a combination of personal competencies and abilities to environments "…that provide opportunities for choice and autonomy in demonstrating those competencies." Dunst *(1991, as cited in Short & Rinehart, 1992)* has suggested that empowerment consists of two issues: (a) enabling experiences, provided within an organization that fosters autonomy, choice, control, and responsibility, which (b) allow the individual to display existing competencies as well as learn new competencies that support and strengthen functioning. The descriptions of empowerment by Rapport and Dunst brings the extremes of continuum together. Martin *(1990)* identified three measures of teacher empowerment: Teacher Efficacy, leadership Efficacy and Decision-making Efficacy. Morris and Nunnery *(1993)* in their investigation studied four dimensions of teacher empowerment: Mentoring Self-Efficacy, Teaching Self-Efficacy, Professional Knowledge, and Collegiality. Decision-making was the single definition of teacher empowerment in a study by Moore & Esselman *(1992)*. This decision-making was reviewed on two dimensions: classroom based and school based. McLaughlin & Knudsen *(1991)* viewed teacher empowerment as based on professional knowledge. They argued that teacher's development of professionally relevant knowledge is necessary for genuine teacher empowerment. Short and Rinehart *(1992)* presented six empirically derived dimensions of teacher empowerment: Decision-making, Professional Growth, Status, Self-Efficacy, Autonomy, and Impact. Empowerment, as perceived by Short, Greer and Melvin *(1994)* is a process whereby school participants develop the competence to take charge of their own growth and resolve their own problems. It is individual's faith that they have the necessary skills and knowledge to improve the situation in which they operate. Eric Wan *(2005)* discusses empowerment at three levels: the teacher level, the administrative level and the school level which are further subdivided into two factors: human factors and operational level. At teacher level, teacher empowerment is viewed as a process whereby teachers develop their competence

Table 1: Dimensions of Teacher Empowerment

Sr. No	Dimensions of Teacher Empowerment	Authors
1.	Authority	Light foot (1986)
2.	Autonomy	Boles (1990); Common (1985); Dunst (1991, cited in Short & Rinehart1992); Lightfoot (1986); Short (1992)
3.	Collegiality / Collaboration	Boles (1990);Bredenson (1989);Lieberman & Miller (1990); Morris & Nunnery (1993); Rappaport (1987); Yonemura (1986); Zeichner (1991)
4.	Decision Making	Boles (1990); Bredenson (1989); Lightfoot (1986); Lieberman & Miller (1990); Maeroff (1988); Martin (1990); Moore & Esselman (1992); Ruscoe, Whiteford, Eddington & Esselman (1989); Short (1992); White (1992); Zeichner (1991)
5.	Impact/Casual Importance	Rappaport (1987); Short (1992)
6.	Leadership	Liaberman & Miller (1990); Martin (1990)
7.	Mentoring	Morris & Nunnery (1993)
8.	Professional Growth	Short (1992); Yonemura (1986); Zeichner (1991)
9.	Professional Knowledge	Lichtenstein, McLaughlin & Knudsen (1991); Maeroff (1988); Morris & Nunnery (1993); Yonemura (1986)
10.	Responsibility	Lightfoot (1986)
11.	Self-Efficacy	Martin (1990); Morris & Nunnery (1993); Rappaport (1987); Ruscoe, Whitford, Eddington, & Esselman (1989); Short (1992)
12.	Self-Esteem	Rappaport (1987)
13.	Status	Levin (1991); Maeroff (1988); Short (1992); Sprague(1992)
14.	Curriculum Planning/Design	Levin (1991); Maeroff (1988); Yonemura (1986)

to take charge of their own work and resolve their own problems. At the teacher level, the foundations of empowerment are (i) Human factors which include the components such as psychological empowerment, motivations, professionalization, and truth, and (ii) Operational factors which include components such as autonomy and information sharing. At the administrative level, empowerment is thought as a personality characteristic and refers to the innate attributes of the leader that motivate behaviour in various interpersonal situations. At the administrative level, the foundations of the empowerment are (i) Human Factors which include components such as visionary leadership, empowering mentality, emotional leadership and trust, and (ii) Operational Factors which include decentralization, information sharing, and collaboration. At school level, empowerment has been considered in terms of organizational structure and organizational culture. The foundations of empowerment at school level are (i) Human Factors which include school culture component and (ii) Operational Factors which include components such as changes in structure and process as well as organizational learning. In the above Table 1 cited in Beverly Klecker and William E. Loadman, 1996 summary of teacher empowerment dimensions along with the details of corresponding authors who research on respective dimensions of teacher empowerment.

Conclusion

Various models of teacher empowerment and the views of different researchers on teacher empowerment reveals that empowerment is a process of enhancing the organizational outcomes and effectiveness and teacher empowerment can be explained in terms of two end points. Firstly Teacher Empowerment is viewed as a construct where the process of participatory decision making and autonomy in decision making regarding the various aspects of school is considered. It is concerned with the teacher's perception about having the autonomy to take decisions with respect to curriculum, their assigned portfolios and development. Also according to this perspective of Teacher Empowerment, power is handed over to classroom teachers by principals who are above them in the school's hierarchical structure. Secondly, teacher empowerment is viewed as a motivational construct. Here teachers feel intrinsically motivated for their own empowerment. This kind of empowerment can

be accessed through their perception about their status of affirmation, their level of engrossment in the work, the expertise they possess in the area of their interest and their belief about their own efficacy.

Also after having done the review of related literature, we come across numerous dimensions of teacher empowerment, which are in one way or another way responsible for making an individual feel empowered. Here in this paper the major dimensions that the authors feel are crucial for empowerment of an individual and are also supported by majority of researchers in the literature are *Autonomy in Decision making, Status, Engrossment, Expertise, Self-efficacy.* According to Authors, the autonomy in decision making dimension is extrinsic aspect of empowerment. According to this aspect, power is handed over to classroom teachers by someone above them in the school's hierarchical structure mostly it is the principal of school. This dimension briefly refers to teacher's perceptions about their authority, freedom and their decision making powers in areas like curriculum planning, curriculum transaction, evaluation, assigned portfolios, and teacher development. Status as a dimension of Teacher Empowerment pertains to teacher's perception that they enjoy the professional respect and admiration of those with whom they work and for whom they work; that they have collegial support and respect for their knowledge. Engrossment refers to being totally and happily immersed in one's work and having difficulties detaching from it because it carries them away. The degree of engrossment in the work shows how the teacher feels belonged to the work and institution. Expertise as a dimension of Teacher Empowerment deals with the teacher's perception regarding their own efforts for enhancing their knowledge of the subject and of the pedagogy. It also focuses on the creative and innovative practices that knowledgeable teachers use for teaching in the class. Basically a teacher who is up-to-date with his/her subject knows how to make students learn the concepts with different instructional styles. Self-Efficacy dimension pertains to teacher's belief that they possess the necessary skills and abilities needed to help students develop holistically, that they are efficient in building effective learning programs for students and that they can affect changes in student's learning.

From the above discussion it is clear that for achieving organizational outcomes and effectiveness the role of work environment is very important and a favourable work environment can enhance the individual's autonomy and interest in their work. "Individual's that have autonomy will make more rational choices, and arrange their own actions," (Deci et al., 1989) and will help in creating a very knowledgeable space (school) for the future generations. In education, empowerment as a leadership and reform approach rests primarily on a belief that the organizational effectiveness is enhanced by participative decision making by teachers related to the problems of practice. Specifically, research suggests that teacher empowerment have its foundation on teacher involvement in decision-making (an essential dimension of empowerment), but for that involvement to be meaningful, teachers must be given chances to take decisions regarding issues directly related to teaching and learning, and teachers must perceive that their decisions do have an impact on the working of organization.

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Role of E-PG Pathshala in Development of Higher Education

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Higher education plays a key role in driving the development of a country. With the emergence of Information and Communication Technology (ICT), there has been a fundamental change in every walk of life ranging from business to governance and administration to education. Education system has seen unprecedented changes in the practices of teaching, learning, information storage and retrieval, administration and evaluation. Information is considered as one of the important resources, the use of ICT services to collect and disseminate information has been negligible as per most of the researchers. Higher education in India is confronted with three major challenges viz Access, Quality and Equity. Integration of ICT in higher education offers a best solution to reach out to people in mass, cutting across the geographical, cultural and socio-economic barriers. ICT offers a unique opportunity for the people, especially the facility challenged to have access to knowledge at their workplace, especially girls, who are not able to attend formal education. The advancement in information technology have led a positive impact on the changing nature and concept of education, technological advancement has changed the face and pace of education all over the world, making it more vibrant and distended than ever before. Earlier education was limited to some places imparting education like schools and colleges; however, this trend has now changed, people now a days make use of online services to get benefited from various fields of education. Online services are provided on lot of platforms and websites, all over the world. The E-PG Pathshala (Electronic Post Graduate School) is among one of the prominent online portals that provide authentic and reliable study material for large number of postgraduate students. This paper is an attempt to shed a light on the role played by E-PG Pathshala on the delivery of educational services to a vast number of postgraduate students in India and abroad.

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The development of ICT revolutionized the process of education, the field of teaching and learning has undergone an enormous change. The trend towards the learning through theself-directed educational resources in various fields has automatically grown. It is the process in which the learner uses his/her own inherent ability to manage his own learning process by understanding himself/herself as the source of his/her own decisions and actions feeling it as a responsibility towards his/her self-directed learning (Sze-yeng & Husain 2010). The life of learners has been transformed by free and open content through online learning. Open course ware e-learning is more help full for those who are not able to avail the facilities of classroom learning and other learning methods like prisoners, those lying in hospitals, and also for those who are not able to pay their fee and those who want to learn and become productive members of society. Users are able to learn by availing the facilities of e-texts, audio and video sources and make the assessment of their progress through online tests. The learning through this method in present scenario can be more suitable to learners, where they are enthusiastic to use equipment of ICT in their daily life.

The National Mission on Education through Information and Communication Technology (NMEICT) is envisaged as a Centrally Sponsored Scheme to leverage the potential of ICT, in teaching and learning process for the benefit of all the learners in Higher Education Institutions at anytime anywhere by any mode. Its motto being "to provide connectivity up to the last mile", the NMEICT aims to extend computer infrastructure and connectivity to all higher educational institutions (HEI) of the country. Then number of HEIs will grow in future.

NMEICT seeks to bridge the digital divide, i.e., the gap in the skills to us computing devices for the purpose of teaching and learning among urban and rural teachers/learners in higher education dominant empower those, who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy. This will enable them to make best use of

ICT framework for teaching. NMEICT is focused primarily on development of high-quality e-content in all disciplines and subjects at various levels.

The projects under NMEICT can broadly be classified as; (a) e-content development. (b) Infrastructure development. (c) Social impact. The topics covered each domain are not exhaustive but indicative. Online learning that was once an asset to financially high class of people, however with the initiative of e-learning programs by NMEICT, MHRD now studies have become approachable to all classes of learners providing education free of cost. A student who may not be able to study at institutes of excellence like IIT, IIM, NIT, AIIMS, IISER etc. but want to gain knowledge from learned faculties or students belonging to such institutes. One can avail the benefits of learning and performing live discussions with an expert team of faculties. For them it has become easy at just a click away by visiting e-learning platforms like e-Pathshala, e-PG Pathshala etc. it is boon to all postgraduate students, irrespective of any back ground.

The University Grants Commission (UGC) has taken upon itself the responsibility of the development of E-content in seventy-seven different subjects at the post graduate level. This initiative has been named as e-PG Pathshala. Under this initiative, the UGC with its other allied stakeholders has developed a high-quality material, in four quadrants, in different subjects across all disciplines. The material will be available to both the teachers and the students in the form of open online courses through the Learning Management System (LMS) set up at INFLIBNET centre as well as through Sakshatportal. To accomplish this goal, UGC seek the contributions from academic experts belonging to various educational institutes. The e-content is being developed by subject specific experts in order to make it easily accessible to learners, every day the number of learners is going increased.

E-PG Pathshala

It is an online e-learning platform maintained by INFLIBNET centre and funded by MHRD Government of India. The e-PG Pathshala is an educational dedicated portal available in open access. E-PGPathshala is an initiative of the MHRD under its National Mission on Education. The MHRD, under its NMEICT has grant in aid for production of e-content. The executing authority of this programme is UGC, 77 subjects across all the disciplines of social science, arts, fine arts, humanities, natural

and mathematical sciences linguistics and languages area being developed by the subject experts and other research and development institutes across the country. The UGC has constituted a standing committee on e-PG Pathshala on e-content creation to monitor and coordinate the activity of e-content creation in a most effective and efficient manner. In order to have uniformity of the UGC e-content project the content being developed under NMEICT, MHRD, the Standing committee of UGC has been expanded to include 13 regular standing committee members of the NMEICT, MHRD.

The standing committee is the apex level decision making body for the e-PG Pathshala. The Dy. Secretary UGC is the coordinator of the standing committee of UGC on e-PG Pathshala. They are the brain for developing courseware plus developing the interactive sessions of e-content between website and students. The digital library of e-PG Pathshala ensures to meet the best standards in each seventy-seven disciplines. Thus, Qualitative teams of multimedia managers, coordinators, investigators, content writers and reviewers have furnished every discipline and their respective subjects. The total number of visitors who accessed the e-PG Pathshala from 19th March 2014 to 23rd March 2019 is 4869856. The website is a virtual library of more than 23000 e-texts, more than 23000 learning videos more than 5000 experts, more than 30000 quizzes, with total count of 70 subjects and 723 papers from multidisciplinary context. E-content of e-PG pathshala used for Massive Online Open Course (MOOCs) on SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) and for telecasting educational videos on 10 DTH channels under SWAYAM-prabha project. E-content is available in open access globally visitors from various countries like 6992+from USA, 1030+from China,611+from Russia etc. The e-PG pathshala provides e-content in four quadrants. It can be used as open educational resource where no teacher support/ hand-holding for students is available.

E-Content Module

It is very important to develop an interactive, dynamic and quality content rich media for the learners. The development of such e-contents aims at delivering the right knowledge to the audience. It is imperative that the content be interactive enough to pass the right message and theory; incorporating animations, quizzes, and simulators with working exemplification, 2D-3D graphics and others could

achieve this. To fulfil these requirements and focusing upon the much advancedand qualified sectors of postgraduates the NMEICT has proposed four quadrants of e-components for e-learning (Rao,2011). The portal of e-PGpathshala is fulfilling these four quadrant conditions successfully. Courseware are designed so, where each subject consists of 16-core paper (4core papers / 4semesters / PG course).Each paper contains around 35-40 modules covering 40 hours teaching duration. Each module consists of following quadrants:

First Quadrant: This quadrant furnishes the requirement of accessing e-contents. This may include, e-books, illustrations, PDFs along with embedded video demonstrations. This quadrant involves the designing and defining of course Structure and textual contexts respectively.

Second Quadrant: This quadrant provides teaching environment via e-tutoring. It takes care of visual ability of the student. It provides a zone of rich multimedia programs. This may include 30-45 minutes long audio and video clips, animated topics and virtual labs.

Third Quadrant: This quadrant provides the provisions of accessing multiple web resources. This could be in form of hyperlinks that navigates student to the specific external learning resources. This may include, 'Points to Remember', 'Glossary', 'FAQ', 'Blogs', 'Discussion Forums' and so on.

Fourth Quadrant: This is the quadrant of self-assessment, an important zone. A student can anytime check his/her progress or his/her understandings for the learned subjects by accessing the assessment and evaluation tools. This includes various quizzes, question and answer sessions, multiple choice questions (MCQs), true or false, sequencing, and problem solving etc.

Development of E-Content Module

INFLIBNET has designed the courseware for every subject on e-PG Pathshala. It is also representing the various implementede-learning methods in form of e-contents, e-tutorials, Links and the education portal Sakshat developed and launched by MHRD, Government of India(2006) has many professional registered users. The prime aim of this site is to furnish the professional demand of teachers and other academicians. It has representatives mostly from Government Organizations like KVS, NIOS,

IGNOU, NCERT, NGOs etc. (Department of Higher Education, 2016). Many of the relevant e-content materials exported to the e-PG pathshala to enhance students learning assessment tools.

Students Model of Learning

The spectrum of cyberspace is providing a wider scope of learning, group-discussion, forming e-groups, writing blogs or participating in news-groups. Irrespective of such proliferation, there exists a divide, the digital divide. This kind has divided the whole society into two. One sector is having privilege of best uses of cyberspace whereas the other sector is disadvantaged one. The different types of learners are as under:

- **Type-1 Learners:** They are the disadvantaged group of students unaware of digital libraries and other free modes of learning available for them as an Initiate by the Government. They face many problems like lack of apt study material, Questionnaires and assessment tools due to unawareness and financial terms.

- **Type-2 Learners:** They are the one who has the access to e-contents, PDFs, e-books and PPTs. This group of learners is very much able to collect notes and other study materials but where they lag is the proper usage of multimedia enriched materials. This may include online videos on some particular topic by a University or a learned faculty.

- **Type-3 Learners:** They form the advantageous section of digitally divide society. They are well verse with the usage of e-texts, visual tools like usage of multi-media enriched courses. However, the point of knowledge seizure lies into unawareness of a collaborative platform for online discussions.

Resources of e-PG pathshala

E-PG pathshala provides enumerable resources to students, teachers, and all those who want to get resourceful information available on this platform for their use at post graduate level of learning. As a resourceful gateway this portal provides authentic and reliable information to millions of stakeholders of education from various fields. It provides free and easy access to all the people who want to get benefitted from it. The resources by e-PG pathshala are in the form of e-content divided into various types of modules. Table 1showing the report of recourses provided by e-PG pathshala to people from different domains of life.

Table 1.1: List of Stream and Subjects available under e-PG Pathshala

Stream	Subject	Number of Subjects available
Humanities and Arts	Comparative Literature, Comparative Study of Religions, Architecture, Home Science, Planning, Performing-arts/dance, Drama, Theatre.	9
Physical and Basic Sciences	Physics, Statistics, Chemistry, Earth Sciences, Environmental Science, Geology, Jyotish-Giant, Mathematics.	7
Social Sciences	Sociology, Social Work, Education, Women Studies/Gender Studies, Adult Education, Anthropology, Business economics, Commerce, criminology, Economics, Education, Forensic Science, Geography, Hotel and Tourism Management, Human Rights and Duties, Indian Culture and Law, Library and Information Sciences, Media and Communication Studies, Political science, Population Studies, Psychology, Public Administration.	**23**
Medical and Health Science	Pharmaceutical Science, Bioinformatics, Biophysics, Musicology and Conservation, Physical Education, Sports and Health Education, Social Medicine and Community Health, Zoology.	9
Life Science	Biotechnology, Biochemistry, Botany, Food Nutrition, Food Technology.	5
Engineering and Technology	Computer Science, Electronic Science, Analytical Chemistry, Instrumentation, Computational Science, Human Resource Management, Information Technology, Management, Material Science Risk, Disaster Management.	10
Languages	English, Hindi, Chinese, Japanese, Russian Studies, Sanskrit (Acharya in Vyakarna), Sanskrit (M.A), Spanish, Urdu.	9
Total		72

SWOT Analysis of E-PG Pathshala

SWOT method is known as one of the important tools and is used in organizational problem solving and strategic planning. SWOT stands for Strength, Weakness, Opportunity and Threat. It was applied for many fields as a tool of analysis. SWOT method is used popularly for improvement of services in any social institution for better results. For this study, valuable comments from users about the e-PG Pathshala was received and then evaluated under SWOT method and the results are as under:

Strengths of e-PG Pathshala

- Major role: Provides high quality e-content for academics and PG level students.
- Price: Free of cost access to electronic resources.
- Quality: Knowledge based educational resources by subject experts from College, University and R&D Laboratory.
- Download facility: Downloading facility available for users.

Weakness of e-PG Pathshala

- Access to internet: Access to e-resources available online only.
- Power supply: Users suffer problems in rural and urban areas because of constrained power supply.
- ICT Infrastructure: Need infrastructure for accessibility.
- Network connection: Network connectivity for accessibility is essential.
- Speed: Slow speed of internet and downloading.
- Search facility: Search facility is time consuming.
- Technological know-how: Using e-contents needs users to have good knowledge and know-how of technological gadgets.

- Problem in power supply: Needs un-interrupted power supply?
- Limited course material: No sufficient course material available in all the subjects.
- Language barrier: Non-availability of regional language-based course material.

Opportunities from e-PG Pathshala

- Career   Academics and users can do self-study and self-learning for improvement of their knowledge strength.
- Knowledge share: Users can share their knowledge.
- Without wall: Access to information beyond the walls of the library.
- Social, Economic Development: Developing the knowledge base can lead to development of a nation.
- Technology: Adoption of new technology, teacher student participation in e-earning.
- Platform for users: One-point single window interface available.
- Users tendency: Increasing trend of users towards the e-learning.
- Navigation: Timely and instant access to e-resources available.

Threat of e-PG Pathshala

- Cost: For access to e-contents users need to bear cost of internet and ICT infrastructure on their own.
- Development in Technology: Increasing/fast growth of technology.
- Reading print resources: Decrease in reading print collection.
- Resources: Diminishes the use of print collection.
- Risks: Threat from hackers of websites.
- Security for authors: Issues like copyright violation etc.
- Power cuts: Access needs 24x7 power supplies that are not available particularly in rural areas.

Conclusion

The higher education system of India represents the largest system in the world in terms of number of institutions and third in terms of student enrolment.

E-learning through various online portals which provides an opportunity to innumerable learners with learning material outside the classrooms and facilitate the students as well as teachers with a lot of teaching learning material. At present we have many e-learning projects in India but there is lack of awareness among learners, they are not able to get appropriate benefits from it. One such effective and interactive learning portal is e-PG pathshala which is one stop-integrated portal for postgraduate education. This provides e-content in various subjects. The focus has shifted on skilled professionals of society to develop nation skilfully. NMEICT has taken a revolutionary step for improving the quality of education by providing learning portal e-PG pathshala and others like SWAYAM, National Informatics Centre Services (NICS), and National Programming on Technology Enhanced Learning (NPTEL) etc. however there needs to be an improvement by providing improvised facilities to learners as well as teachers and also developing the already existing ones which is the need of hour. If the steps taken properly, we can educate the society freely without any bias and at any time and any place. Thereby developing a nation that will be equipped with professional and skilled people with independent qualitative education.

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Cutting-edge Innovations for Fostering Smart Agriculture

M Venkaiah Naidu, Honourable Vice President of India deliverd Convocation Address at the 58th Convocation of Indian Agricultural Research Institute, New Delhi on 14th February, 2020. He said, "While the position on food front is comfortable with a total food grain production of 283.37 million tonnes, India, however, ranks at 102 in the Global Hunger Index. The alarming prevalence of malnutrition and hidden hunger are matters of great concern. I am told that more than 80 per cent of adolescents in India suffer from hidden hunger. This problem has to be addressed on a war footing as youth are the backbone of the nation." Excerpts

It is a matter of immense pleasure for me to be with you today on the auspicious occasion of 58th convocation of the Indian Agricultural Research Institute, a premier institute of agricultural research, education and extension in our country. My congratulations to the students who are receiving the postgraduate and doctoral degrees today! The country is proud of the achievements of IARI, which has heralded the Green Revolution through development of high yielding wheat varieties. The achievements of IARI post-Green Revolution phase has been truly remarkable, considering the quantum jump in production of wheat and rice to 101.2 tonnes and 115.6 million tonnes, respectively, boosting the country's foodgrain production from 50.82 million tonnes in 1950-51 to 283.37 million tonnes in 2018-19.

The advanced crop varieties and technologies developed by the institute have been important in strengthening the Indian economy and the prosperity of farmers. I am happy to know that the Pusa Basmati varieties predominate basmati cultivation in India and are helping in securing higher production and profit to the farmers, apart from foreign exchange worth Rs.33,000 crores annually to the country.

Similarly, I am told that IARI wheat varieties like HD 2967 and HD 3086 have played a vital role in enhancing wheat production and productivity in India. It is heartening to note that these varieties alone account for more than 12 million hectares of cultivation by farmers and contribute to more than 50 percent of the country's wheat production.

While the position on food front is comfortable with a total food grain production of 283.37 million tonnes, India, however, ranks at 102 nd in the Global Hunger Index. The alarming prevalence of malnutrition and hidden hunger are matters of grave concern. I am told that more than 80 per cent of adolescents in India suffer from hidden hunger. This problem has to be addressed on a war footing as youth are the backbone of the nation. Undoubtedly, malnutrition is a serious health issue as it not only increases susceptibility to various issues but also affects the socio-economic growth of the country.

Besides launching a massive awareness campaign about nutraceutical and therapeutic values of agricultural produce, there is a need to increase the production of nutritive food to overcome such problems. I am happy to learn that significant progress was made by this institute in developing high yielding, disease resistant and nutrient-rich varieties of crops. I was informed that IARI has released several bio-fortified maize hybrids rich in lysine, tryptophan and pro-vitamin A and pearl millet, lentil varieties rich in iron and zinc—this indeed is a step in the right direction for making India nutritionally secure.

I am also happy to note that the institute has developed several high yielding mustard varieties, which will help in cutting down the edible oil import bill. Thus, with these cultivars, I am confident that India will achieve the target of sustainable developmental goals (SDGs). As we all are aware, climate change has emerged as a serious threat to agriculture. Climate change-induced rise in temperature and changes in rainfall pattern are adversely affecting agriculture. Many a time, the terminal rains are creating havoc by destroying the crops ready for harvest.

Assessing methane emissions from paddy plants is one of the institute's most outstanding achievements, which can be helpful in protecting India's interests in climate change negotiations with the United Nations. There is a need to analyze the effects of climate and

generate technology for climate-resilient agriculture and enhance the adaptive capacity of farmers.

We are now in the era of smart agriculture. Application of digital technology, remote sensing technology, sensors, artificial intelligence, biotechnology and molecular genetics will help immensely help in fostering cutting-edge innovations. The focus of every scientific endeavor has to be on improving the lives of the people, particularly the marginalized sections. Inclusive development is the need of the hour. Therefore, I urge you to lay emphasis on enhancing the productivity of small and marginal farms. As you all are aware, the small and marginal farmers are the most vulnerable to agrarian challenges and their welfare must be accorded the highest priority.

According to the Agriculture Census, the total number of operational holdings in India is 138.35 million with an average size of 1.15 hectares. Of the total holdings, 85 percent are in marginal and small farm categories of less than 2 hectares. These small farms, though operating only on 44 percent of land under cultivation, are the main providers of food and nutritional security to the nation. However, these small farms have limited access to technology, inputs, credit, capital and market. Hence, it becomes incumbent upon every stakeholder associated with agriculture to work for improving lot of small and marginal farmers.

It is a matter of pleasure that IARI has established a state-of-the-art plant phenomics facility named as "Nanaji Deshmukh Plant Phenomics Center", which was dedicated to the nation by Hon'ble Prime Minister of India, Shri Narendra Modi on October 11, 2017. Machine learning and Artificial Intelligence-based analysis are being employed to provide impetus to genetic improvement towards more crop per drop in major food crops.

I am also pleased to note that an Innovation Centre is being developed on this campus to foster innovation, including grass-root innovations. Farmers should be motivated and facilitated to join experimentation at research institutes. They must also be guided for obtaining patents and IPR rights.

The central government took a historic step last year to honour 12 farmers with Padmashri awards for their path-breaking innovations in agriculture. Such recognitions uphold the morale of innovative farmers and entrepreneurs. With the government aiming to double the income of the farmers in the next few years, there is a need for concerted efforts for improving agricultural productivity. Combination of appropriate policies, technologies and institutional arrangements are vital to transform agriculture and make it sustainable and profitable.

I have always been stressing on the need for diversifying traditional cropping systems as it would reduce economic risk while increasing the scope for higher profitability. In addition, integrated farming systems combining various agro-enterprises such as field crops, fisheries, horticulture and animal husbandry would ensure increased employment and agricultural income throughout the year. Diversifying traditional cropping systems and taking allied activities would provide resilience to farmers to withstand the vagaries of nature.

While attaining a production of over 311 million tonnes of horticultural crops has been phenomenal, the full potential in this area is yet to be realized due to lack of adequate facilities for cold storage, processing and value chain development. I am sure that the schemes proposed in this year's budget like "One District One Product", "Kisan Rail and Kisan Udan" for speedy transport of perishable products, "online organic market" will provide fillip to horticulture sector.

Various schemes rolled out by the Government like Pradhan Mantri Fasal Beema Yojana, Pradhan Mantri Krishi Sichayee Yojana , "Har Keti Ko Paani", "more crop per drop", 'Soil Health Card' and e-Nam are all aimed at securing a better future to the farmer. A vital contribution of national importance by this institute has been the development of neem-coated urea. This increases nitrogen utilization efficiency by 10 per cent compared to uncoated urea. With the government making the use of neem-coated urea mandatory, the farmers are saving 10 per cent urea.

I am also happy to note that the new scheme called "Pradhan Mantri Kisan Samman" (PM Kisan) for assured income support to the farmers has immensely benefitted around 12 crore farming families. I am happy that PM Kisan SAMPADA Yojana seeks to create modern infrastructure with efficient supply chain management from farm gate to retail outlet. It will not only provide a big boost to the growth of the food processing sector in the

country but also help in providing better returns to farmers. Indeed it is a big step towards doubling of farmers income, creating huge employment opportunities in the rural areas, reducing wastage of agricultural produce and enhancing the export of processed foods.

Annadata scheme is to be expanded to include "Oorjadata" to help farmers link pumps to solar grid. Farmers having fallow and barren lands can set up solar power generation units and they can sell it to grids to make a living. As we all are aware, agriculture holds immense potential for entrepreneurship. Agriculture needs to be developed as an enterprise and find ways to attract youth by creating an appropriate entrepreneurial ecosystem. It is equally important to strengthen the incubation centers for the promotion of agri-enterprises. I am happy that IARI has set up incubation centre to empower youth and promote agri-business enterprises.

Besides research, IARI has also excelled in agricultural education and in producing quality human resources for agricultural research, education, and extension. I appreciate the contribution made by the institute's scientists, students, and all other staff members in advancing research and technology development.

Finally, I would like to once again congratulate the students who have completed their M.Sc and Ph.D. degrees. I wish you all success in your future endeavors. I am confident that IARI will continue to serve the nation through scientific advancements and innovations in agriculture. ❑

CAMPUS NEWS

Webinar on Disruptive University

The whole world, including India, is passing through unprecedented times due to the outbreak of COVID-19 pandemic. As all universities, colleges and schools are closed due to national lockdown, the teaching-learning processes has been badly disrupted. The University Grants Commission (UGC) and other apex education bodies issued COVID-19 specific guidelines for Indian Higher Education Institutions impacting about 1,000 universities, 40,000, over 3.75 crore students and 14 lakh faculty members in varying degrees. Remote learning, distance learning, home learning, online learning, e-learning and webinar are the buzzwords of the day. The educational institutions have adopted e-learning platforms. In view of all this, a Webinar on 'Disruptive University' was organized by Elets Technomedia and Digital Learning Magazine, recently. The webinar was graced eminent speakers from the Higher Education who presented their views over the issue.

Prof. M M Salunkhe, President, Association of Indian Universities, New Delhi and Vice Chancellor, Bharati Vidyapeeth Deemed University, Pune said, the role of teachers will change, the mode of assessment will change and technology will play an important role. The traditional programmes of universities will be challenged. Students will prefer smaller duration programmes which can help them in employability. Universities have to make their own technological platforms for providing education to students. He further said that universities must focus on quality education. Education institutes should be more vigilant over use of technology. Blended mode of teaching and online education will be strategic priorities in coming days. The entry and exit points in education must be flexible, he added Conducting examination will be the main challenge as all the exams cannot be done through virtually. Universities have to focus on content creation, he said. He also said the pandemic has affected the universities as most of them have adopted online learning but things might change when campus opens.

Dr. Amit Kappor, Chairman, The Institute of Competitiveness, New Delhi said, we need to change the mind-set of faculties. Now, faculties have to change their role and act as an idea generator. There will be huge shift in education sector. Universities have to provide personalized learning and modular teaching. There will be challenges for students, as things are changing drastically. He also raised concern over the plunge of knowledge level within the students. He said that now educators have to create entrepreneurs. Universities have to create entrepreneurial faculty. We have to create a new fundamental mind-set as universities are places for learning not employment. There is a technology gap within the students and we have to take it to last mile, he further added. About examinations, he said that the role of regulator has to change and need to create new processes to evaluate. We need to understand the skill set of students, which they need for future prospective. The world has changed a lot in last few weeks and need to create academic experience for students, he said. The productivity of teachers has increased a lot and universities must provide time to faculties to upgrade themselves, he concluded.

Dr. Anant Rao, Professor Emeritus and Former Vice Chancellor, Dubai University, Dubai said, we are adopting online education for the last 15 years but last month, the entire syllabus was put on online mode. The focus was on modular content. We have adopted modular outcomes. The learning outcomes will be mastered within three-four weeks. Students will take their own time to finish the modular courses. He also discussed on the new education policy in India and said that it is outcome and employment-based. The syllabus will be reduced to 30-40 per cent when the institutes will be reopened. With new things coming up for students, they will not feel they have lost time. We need flexibility in education sector. We have to accept the reality and change in the education sector, he added. He also said the transition has to take place in the education sector for the betterment of students. Indian student have highest ability and capturing the ability of students is important for universities. Curriculum assessment has to be done by universities post-COVID.

Dr. M S Moodithaya, Pro Vice Chancellor NITTE University, Mangalore said, Higher education stakeholders need to think different to rise from the unprecedented crisis. Disruptive University is one

which makes changes regularly. In the post-COVID era, all the universities have to adopt new cost control ways to manage the financial issues." He also said new online education and tools are main challenges for universities. We have taken the challenge positively and adopted the technology. The remote teaching cannot replace the face to face teaching. Many universities don't have resources to provide digital infra for students, he added. The online education must be adopted by universities for temporary basis as peer to peer learning is essential in campus. The universities must adopt blended teaching, when it reopens, he added. Over placements, he said there will be an issue and we need to change the curriculum. We need to focus more skill sets rather than only academics, he said.

Dr. D N S Kumar, Vice Chancellor, Ansal University, Gurugram said, currently, employability skills of students are less than 25 percent. We need to understand why the employability is so less. Three things are very important quality, relevance and personalised learning and certificate oriented education. What can we do is more important that what we are doing now. We must adopt entrepreneurial model for students. We need to focus on research on holistic perspective. He also said that the universities must customize the education for students as industry will recognize the competency not certificates in coming days. He said that parents complemented the steps taken by Ansal University to engage students in this pandemic. The university had sensed the crisis and started training for online classes from the month of February. Over teachers, he said the universities must bring teacher-led education and allow them to grow. The institutions must allow the younger faculties to enlarge their horizon.

Webinar on Conserve and Celebrate Biodiversity

A Webinar on **'**Conserve and Celebrate Biodiversity' was organized at ICAR-Indian Institute of Horticultural Research, Bengaluru, Karnataka to celebrate 'World Environment Day' on 05th June, 2020. The theme was 'Time for Nature' with a focus on its role in providing the essential infrastructure that supports life on Earth and human development. Experts from different fields of biodiversity were the panelists and they made deliberations on various aspects of biodiversity. It was attended by more than 425 participants from staff of ICAR-IIHR and ICAR Institutes, students and staff from different agricultural and traditional universities and general public.

Dr. G R Smitha, Nodal Officer of Sports and Staff Welfare Committee welcomed the panelists and participants and emphasized about the relevance of celebration of World Environment Day. Its main aim was to take positive environmental action, protect nature and the planet Earth. Since 1974, it has been celebrated every year on 5th June; engaging governments, businesses, celebrities and citizens to focus their efforts on a pressing environmental issue. Biodiversity is the foundation that supports all life on land and below water. It affects every aspect of human health, providing clean air and water, nutritious foods, scientific understanding and medicine sources, natural disease resistance and climate change mitigation.

The webinar started with the presentation by Dr. P E Rajashekharan, Principal Scientist on 'Importance of Conservation and Biodiversity-The Backbone of Agriculture'. He explained about the importance of genetic diversity of different agricultural and horticultural crops, its conservation strategies, climate change and its relation with pandemics related to and ways to address these challenges. He made a point on changing from *ex situ* to on farm *in situ* conservation in case of agro-biodiversity. He also emphasized the importance of conservation of wild relatives for imparting biotic and abiotic stresses; agricultural Biodiversity for nourishing people and sustaining the planet. He expressed concern over of genetic erosion and loss of biodiversity.

Dr. R Ramanatha Rao, Co-founder, Global Research for Development Support Ventures made his deliberations on 'Tree Fruit Diversity - India's Goldmine'. He highlighted about the fruit biodiversity and how it is contributing towards the nutrition, economy and sustainability. He emphasized on the role of custodian farmers in conserving the diversity on farm with the example of the successful UNEP GEF project on tropical fruit crops. Although fruits have always been important agricultural species, it is only in recent years that there is an increasing awareness of the potential of native tropical fruit species as good sources of dietary vitamins, minerals and energy. They also play a very significant role for the wellbeing of the people through enhancing household income, employment generation for rural youth, women, and environmental protection. The successful conservation is achieved through custodian farmers in the case of fruit crops, he added.

Dr. A N Ganeshamurthy, Former Principal Scientist and Head, Division of Soil Science and

Agricultural Chemistry, ICAR-IIHR, Bengaluru spoke on the topic 'Soil Diversity and C sequestration'. He covered various aspects *viz*., physical, chemical and biological components of soil and the importance of soil biodiversity. He also explained how these components are playing an immense role in carbon sequestration. He also gave simple ways and means to improve the carbon content of the soil like use of organic mulches, avoiding burning of on farm wastes, *etc*.

Dr. V V Belavadi, Emeritus Scientist, Department of Entomology, University of Agricultural Sciences, GKVK, Bengaluru highlighted the vital role of pollinators in agriculture for increasing productivity, ecological services, food security and nutritional security. He also explained different species of pollinators involved in pollination of different agricultural and horticultural crops. He expressed his concern pollinators services are valued by the human community and showed the method to estimate the value for the pollination services we receive from pollinators by giving example of Cardamom and Pigeon pea crops.

Dr. S Ganeshan, Former Principal Scientist and Head, Division of PGR, ICAR-IIHR, Bengaluru stressed about the need for cryopreservation, ways and means and future prospects of cryopreservation. With two case studies one from ICAR-IIHR and the other from Jawaharlal Nehru Tropical Botanical Garden Research Institute, Thiruvananathapuram, Kerala, he explained the importance of conservation. He also emphasized the importance of integrating conservation to achieve maximum diversity among different crops.

After the presentation there was an interaction session, wherein the participant's queries were clarified by the expert panelists. The queries raised by the participants in Q&A section of the video conferencing was also answered by the expert panelists.

Dr. M R Dinesh, Director, ICAR-IIHR, in his concluding remarks emphasized the need for conservation in agricultural and horticultural crops. He explained ICAR-IIHR's role and activities in collection and conservation of germplasm in various horticultural crops. He also made a mention on three jack fruit varieties which were collected from the farmers' filed and how ICAR-IIHR popularized the same. He also mentioned the success story of UNEP GEF project and emphasized the need of conducting diversity fair in different horticultural crops for popularizing the same. Further, he stressed the conservation of native germplasm of horticultural crops. Finally, the webinar ended with vote of thanks proposed by Dr. T S Aghora, Nodal Officer, PME, ICAR-IIHR.

Workshop on Innovation Management and Entrepreneurship Development

A five-day Workshop on 'Innovation Management and Entrepreneurship Development' is being organised by the Department of Management Studies, Indian Institute of Information Technology, Allahabad during July 20-24, 2020. The students, research scholars, professionals, executives and entrepreneurs who have interest in understanding innovation and innovation management may participate in the event.

Innovation Management and Entrepreneurship Development is gradually becoming very significant in various areas of business. Innovative start-ups and new enterprises act as a catalyst for the economy. Novel opportunities and market gaps are identified and resources are allocated to them to produce something new and useful. The present firms innovate in order to beat the competition and have an edge from their counterparts. The need of the hour is to develop effective policies to cater to the new challenges such that the modern day problems can be solved. The workshop focuses on the basic and advanced techniques of innovation and entrepreneurial development and how it can be imbibed to the participants. The pedagogy aims on the skills necessary for innovation and entrepreneurship and successfully managing it. The planning, development and initiation of the innovative ventures stage wise will be inculcated to the participants. The areas covered include the foundations of innovation management, entrepreneurship development along with tools and techniques for creative and innovative thinking. The important role of intellectual property along with the types will be discussed. The development of business models along with the budget and finance issues will be taken up by the experts. Besides, researches in these areas will also be part of the discussion.

For further details, contact Coordinator, Department of Management Studies, Indian Institute of Information Technology, Allahabad-211012, Phone: 0532-2922000, 2922025, E-mail: ranjitsingh@iiita.ac.in/ vijayshri@iiita.ac.in/madhvendra@iiita.ac.in. For updates, log on to: www.iiit.ac.in.

Workshop on Machine Learning Deep Learning and Computational

A three-day Online Workshop on 'Machine Learning Deep Learning and Computational Intelligence for Wireless Communication' is being organised by the Department of Electronics and Communication Engineering, National Institute of Technology, Tiruchirappalli, Tamil Nadu during October 22-24, 2020. The workshop aims in consolidating the experimental results, integrating the Machine Learning, Deep Learning and Computational Intelligence for Wireless Communication. Due to the feasibility of collecting huge data from mobile and wireless networks, there are many possibilities of using Machine learning, Deep-learning and the Computational Intelligence to interpret and to hunt knowledge from the collected data. The topics of the event are:

Machine Learning

- Multiple Input Multiple Output Regression.
- Probabilistic Discriminative Approach.
- Multi-Class Logistic Regression.
- Probabilistic Generative Model.
- Support Vector Machine.
- Dimensionality Reduction Techniques.

Deep Learning

- Multilayer Perceptron.
- Boltzmann Machine.
- Auto-Encoders.
- Convolution Neural Network.
- Recurrent Neural Network.
- Generative Adversarial Network.
- Deep Reinforcement Learning.

Computational Intelligence

- Particle Swarm Optimization.
- Bacterial Foraging.
- Simulated Annealing.
- Ant Colony Technique.
- Genetic Algorithm.
- Social Emotional Optimization Algorithm.
- Social Evolutionary Learning Algorithm.

Optimization Algorithms

Adagrad, Adadelta, RMSprop, Adam, SGD

Mobile Data Applications

- Mobile Health Care.
- Mobile Pattern Recognition.
- Natural Language Processing.
- Image Processing Wireless Communication.
- Network Prediction, Traffic Classification, Call Detail Record Mining.
- Automatic Speech Processing.
- Mobility Analysis, Indoor Localization.
- Energy Minimization, Routing, Scheduling, Resource Allocation, Multiple Access, Power Control.
- Malware Detection, Cyber Security, Flooding Attacks Detection, Mobile Apps Sniffing.

For further details, contact Coordinator, Dr. E S Gopi, Associate Professor, Department of Electronics and Communication Engineering, National Institute of Technology, Tiruchirappalli, Tamil Nadu- 620015, Phone: 0431-2503000, E-mail: esgopi@nitt.edu. For updates, log on to: www.nitt.edu.

Conference on Global Deceleration

A One-day Conference on 'Global Deceleration: Emergence of New Economy' is being organized by the Ramaiah Institute of Management (RIM), Bengaluru during August 27, 2020. The conference aims to bring together leading academicians, researchers and scholars to share experiences, opinions, research results on all aspects of global deceleration and the emergence of new economy.

COVID-19, the worst pandemic of our times is affecting global socio-economic systems. Tumbling oil prices, crashing currencies, lower consumptions, tight liquidity and financial instability may become the new normal. Is it the start of the end or is it the beginning of new horizons of global economy? Is it a war too costly or is the global economy about to witness a paradigm shift? The conference is to seek answers and opinions from renowned socio-economic experts on this aspect of COVID-19. Various Tracks of the event are:

- Finance.
- Human Resource.
- Marketing.
- Operations.
- Future of Education.
- Entrepreneurship.
- General Management.
- Other Related Topics.

For further details, contact the Coordinator, Prof. Jeevitha R, Ramaiah Institute of Management (RIM), Bengaluru- 560 054, Karnataka, Mobile: +91 9916089980, E-mail: jeevitha@msrim.org. For updates, log on to: www.msrim.in.   ❑

AIU NEWS

Professor Tej Partap-The New President of AIU

Prof Tej Partap, Vice Chancellor, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar took over as the new President of the Association of Indian Universities (AIU) on July 1st, 2020. He graces AIU as its 98th President. An internationally renowned Policy and Strategy Expert of Mountain Farming Affairs, Mountain Agriculture and Organic Agriculture Development Strategies Prof Tej Partap is currently serving Govind Ballabh Pant University of Agriculture and Technology, Pantnagar as its Vice Chancellor. A breakthrough leader, Prof Tej Partap carries with him a long experience of institutional leadership at national and international level particularly as Vice Chancellor of CSK Himachal Pradesh Agriculture University, Palampur for two terms; Sher e Kashmir University of Agriculture Sciences and Technology, Srinagar and APG Shimla University, Shimla for one term each. At international level, he served as Programme Leader at Mountain Agriculture Division, International Centre for Integrated Mountain Development (ICIMOD), Kathmandu.

A visionary and passionate Agricultural Scientist, Prof Tej Partap was instrumental in preparing the Vision and Mission 2020 of Organic Agriculture in India. He initiated Organic Agriculture movement in India by setting up International Competence Centre for Organic Agriculture (ICCOA). The National Commission on Farmers used his services to formulate hill agriculture sector and organic farming sector reports and to lead the team which prepared the Organic Sub-sector Proposal for 11th Five Year Plan.

An International Mountain Agriculture Development Policy Expert, he made significant contributions as Head of the Mountain Agriculture Programme at the International Centre for Integrated Mountain Development (ICIMOD) for 13 years.

He was on the Steering Committee of the Global Mountain Program of CGIAR for three years and represented Asia Pacific as elected representative on the Governing Board of the Global Mountain Forum (2000-2002) . He is one among the rare few who had the credit of working in the Andean region of South America, Alps in Europe, African highlands, Asian uplands from Thailand to Philippines and Japan and every part of the 8 countries of the Hindu Kush Himalayan region from Afghanistan to China to Myanmar.

Some of his widely acknowledged exceptional achievements include the Tibet Agriculture sector Institutional Capacity Building programme; bringing China's sea buckthorn success story to outside world and bringing the Sloping Agriculture Land Technology of Philippines to our part of the world.

Recognizing his outstanding contributions, he was conferred with Himachal Ratan award in 2001 by H E Governor of Himachal Pradesh. He is also a recipient of award of Honorary Professor of Mountain Agriculture by Tibet Academy of Agriculture and Animal Sciences (TAAAS), Lhasa, China in 1994 and Honorary Professor of Mountain Agriculture by Institute of Geography, Chinese Academy of Sciences, Beijing in 1995.

An ardent researcher Prof Tejpartap has handled several national and international projects and provided consultancy. He has to his credit more than 100 publications which include Books, Scholarly Papers, Reports in highly recognized international and national Journals and supervised many Ph.D studies.

The Association of Indian Universities welcomes him as its new President and is looking forward to gain from his academic acumen, scholarship and vast experience. ❏

THESES OF THE MONTH

SCIENCE & TECHNOLOGY

A List of doctoral theses accepted by Indian Universities
(Notifications received in AIU during the month of Jan-Feb, 2020)

AGRICULTURAL & VETERINARY SCIENCES

Biotechnology

1. Katoch, Megha. **Identification of QTLs linked to early maturity and yield-related traits in horsegram (*Macrotyloma uniflorum*)**. (Dr. Rakesh Chahota), Department of Agricultural Biotechnology, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur.

Entomology

1. Soni, Saurbh. **Studies on natural enemy complex of aphids infesting oilseed brassicas**. (Dr. Surjeet Kumar), Department of Entomology, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur.

BIOLOGICAL SCIENCES

Biochemistry

1. Radadiya, Nidhi Ghanshyambhai. **Transcriptome and hormone profiling of sesame (*Sesamum indicum* L) during interaction with *macrophomina phaseolina***. (Dr. B A Golakiya), Department of Biochemistry, Junagadh Agricultural University, Junagadh.

2. Nirmaljeet Kaur. **Regulatory effect of anti-inflammatory compound (Cinnamaldehyde) in cytokines induced skeletal muscle protein metabolism**. (Dr. Ashwani Mittal and Dr. Sanjeev Gupta), Department of Biochemistry, Kurukshetra University, Kurukshetra.

Botany

1. Nangkar, Atek. **Taxonomic study on the family araceae of Arunachal Pradesh**. (Dr. Hui Tag), Department of Botany, Rajiv Gandhi University, Itanagar.

2. Nyitan, Jami. **Studies on the antioxidant activities of some selected indigenous food plants of West Siang District of Arunachal Pradesh**. (Prof. A K Das), Department of Botany, Rajiv Gandhi University, Itanagar.

3. Taka, Tapi. **Role of microfungi in plant litter decomposition and soil nutrient dynamics of Arunachal Pradesh, North East India**. (Prof. Sumpam Tangjang), Department of Botany, Rajiv Gandhi University, Itanagar.

Zoology

1. Das, Dimpimoni. **Expression of vascular endothelial growth factor receptor-2 (FLk-I/kdr) during perilimplantation period in Albina mice uterus**. (Prof. Hitendra Nath Sarma), Department of Zoology, Rajiv Gandhi University, Itanagar.

2. Khongsti, Shngainlang. **Whole genome DNA methylation profiling of oral cancer patients from Meghalaya**. (Dr. Srimoyee Ghosh), Department of Zoology, North Eastern Hill University, Shillong.

EARTH SYSTEM SCIENCES

Environmental Science

1. Chitranshi, Rishabh. **Studies on utilization of rhizospheric pseudomonads in preventing seed bio-deterioration of *Arachis hypogaea* L, enhancement in seed germination and crop production**. (Dr. Naveen Kumar Arora), Department of Environmental Microbiology, Babasaheb Bhim Rao Ambedkar University, Lucknow.

2. Gupta, Neha. **Study on sustainable and integrated approach for the generation of low-cost algal biomass and biofuel by using agro-industrial wastewater**. (Prof. D P Singh), Department of Environmental Science, Babasaheb Bhim Rao Ambedkar University, Lucknow.

3. Jai Prakash. **Development of bioformulation using beneficial plant-associated microorganisms for protection from fungal pathogens and yield improvement of *Stevia rebaudiana***. (Dr. Naveen Kumar Arora), Department of Environmental Microbiology, Babasaheb Bhim Rao Ambedkar University, Lucknow.

4. Ranjan Singh. **Effect of UV-B and salinity stress on biomass and lipid production potential of microalgae: A study on stress induced molecular signaling**. (Prof. D P Singh), Department of Environmental Science, Babasaheb Bhim Rao Ambedkar University, Lucknow.

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Geophysics

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ENGINEERING SCIENCES

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Computer Science & Engineering

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target. (Dr. Sushma Singh), Department of Biotechnology, National Institute of Pharmaceutical Education and Research, Mohali.

Pharmaceutical Science

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PHYSICAL SCIENCES

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