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G P Pandey

Role of Mass Media in Nation Building

Mahabir Singh and Meenal Malik

Understanding Initial Four Levels of Bloom's Taxonomy for Setting Question Papers

Debal K SinghaRoy

Bridging Social Distancing through Online and Open Distance Learning: Scope and Conditions

S K Yadav

Online Examination in Teacher Education Programmes During Post COVID-19

K Radhakrishnan

Technology: A Sublime Combination of Wisdom and Innovation

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In This Issue		PAGE
ITEMS		
Articles		
Role of Mass Media in Nation Building		3
Understanding Initial Four Levels of Bloom's Taxonomy for Setting Question Papers		8
Bridging Social Distancing through Online and Open Distance Learning: Scope and Conditions		11
Online Examination in Teacher Education Programmes During Post COVID-19		14
Convocation		
Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, Chennai		20
Campus News		23
Theses of the Month (Science & Technology)		26
Advertisement		32

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Role of Mass Media in Nation Building

G P Pandey*

The preamble of the constitution of India provides for the development of a socialist, secular and democratic society having their base on well-defined fundamental rights that are enshrined in our constitution. These allow the citizens to live harmoniously without any social, economic, religious and gender discrimination. To develop is to become more advanced. It means a qualitative change in the structure of the economy, political disposition as well as social environment thereby contributing to the advancement of the nation.

Concept of Nation Building

To understand what nation building is, we must first understand what a nation is. A nation is basically a group of people living in the same territory and who have a common history and culture. The people of a nation visualize themselves as one with a shared destiny which instils in them a sense of belongingness. The sense of oneness and 'we-feeling' develops naturally among the people of a nation.

Nation-building refers to the process of constructing a national identity. It does not occur overnight. Rather it is a gradual process that takes place over a long period of time. Nation building or the process of creating national identity is an ongoing process for any country which initiates with the establishment of modern national states and continue in the form of state politics with an aim to consolidate and promote the nation. It refers to a constructive process of building and maintaining political stability, social cohesion and economic prosperity in an inclusive and democratic way.

Significance of Nationalism in the Indian Context

Nationalism is basically a feeling of belongingness. We experience a feeling of oneness, togetherness, solidarity, brotherhood and that we share a common identity related to the nation. That is, we are Indians. In a diverse land like India, nationality emerged during the British rule. They brought a centralized system of administration, education, railways and so on. Through education, a new social class emerged who inspired our people to fight for Independence. Satyagraha, non-cooperation movement, civil disobedience movement stands as examples of how people belonging to different caste, class, religion and region united to fight against the British for attaining freedom and Independence.

In India, the media became a poignant medium in gaining independence from the 200 years of British rule. If we talk about Gandhi, Nehru, Tilak and many others, they have all utilized the print media to circulate their thoughts and opinions. Even when they were in prison, they continued to do so. All the freedom fighters have distributed their messages and voiced their opinions through the print media, thereby uniting the people to fight for freedom and liberty.

*Head and Dean, Department of Mass Communication, Assam University, Silchar-788011 (Assam). E-mail: gpp59aus@gmail.com

The third world countries which are engaged in the processes of decolonization and development face the common problem of nation building (Atal, 1981). Yogesh Atal in his book 'Building a Nation' states, "...both in the rise of nationalism and emergence of new nations, and in the process of modernization and political development following it, communication play a vital role."

Significance of Mass Media

The collective means of communication which keeps the general public informed about what is happening around the world is the mass media. It refers to the communication channels which are utilized to reach the mass audience. The mass media therefore are the instruments which can pass knowledge and information across a broad spectrum of the society in real time thereby motivating and mobilizing the people, fostering the process of nation-building. Mcquail referred to the mass media as including the entire system within which information is generated and transmitted in order to achieve specific goal (Onwumah, 2015). It includes the print media like newspapers and magazines, electronic media such as radio, television and the New Media including the social networking sites.

Mass media is essentially important because it has the reach. Today in this era of Information and Communication Technologies, mass media transcends the barriers of time and space. It can communicate what is going on in around the globe practically in no time. This power of the media is utilized not only to perform its core functions which are to inform, educate and entertain but also to motivate and mobilize the masses to achieve desired goals. The history of India's struggle for Independence shows vibrant examples of this. Our history shows that the press has gone a long way in contributing to the growth of the nation.

The mass media played a poignant role to actualize the desire of a free India. The press was used extensively and comprehensively to ignite in the masses a sense of self-determination. Press and journalism played the central role in national awakening and also, the freedom struggle (Singh, 2015). The whole phase of freedom struggle was led by the spirited journalism of Sri Aurobindo, Mahatma Gandhi, Bal Gangadhar Tilak, Pandit Makhanlal Chaturvedi among others.

In post-independent India, mass media has contributed in national movement and national integration. It has cultivated the feeling on Indian-

ness and patriotism among the people (Lakra, 2016). But with the emergence of a profit gain media, the spirit of the media seems to gradually fade away. The concern for developmental issues, traditional values and common masses find mere space. The origin of journalism certainly adheres to its basic role of being the fourth pillar of democracy. But while globalization and corporatisation has made the media industry a big one, it should not tilt from rendering its foremost duty as a watchdog of the society. The main focus of the paper is on the role that mass media plays in building a nation. This paper aims to introduce the importance and significance of mass media in the process of nation-building. Also, it talks about the factors restraining the media in this process.

Role of Mass Media in Nation Building

Mass media has a critical role to play in the nation-building process (Onwumah, 2015). Media, as the voice of a democratic nation in a globalized world can play a crucial role in the process of developing and building the identity of a nation. It is the guardian of the people's interest. The media checks and balances the powers of executive, legislature and judiciary. It, as the Fourth Estate, performs the role of watchdog in maintaining political transparency and fighting against corruption. Gate-keeping, setting public agenda and force multiplying are other roles the media must pursue for developing the nation. In a diverse and democratic country like India, media contributes to nation building. To facilitate the process of building the nation, the media needs to focus on different roles.

Education and Raising Awareness

The power or the strength of the mass media should be utilized in a constructive manner by educating the people. As one of its prime function, media must educate and aware the people socially as well as politically. The media is to educate the people regarding the basic human rights. It is the media which can play an efficient and effective role in raising awareness and consciousness among the citizens regarding the policies of the government and also, its limitations. It is the media which holds the responsibility to enlighten and educate the people about the priorities of the nation. The media should make the people realize that being the citizens of the largest democracy they have the ultimate right to elect their leaders and representatives which must be done wisely. Since only the right ones can bring glory to the nation and contribute towards building and developing it.

The media therefore holds the power to make or break governments. The government can effectively utilize the mass media as an instrument of social change. In-depth analysis and recommendations, as provided by the media can largely contribute towards the process of bringing a positive change in the society.

Mobilizing Public Opinion

Media is a vital tool towards good governance. It plays a key role in promoting democracy, mobilizing public opinion as well as influencing people's behaviour. The media can create, mould and reflect public opinion in a democratic country like India.

Mouthpiece of the Society

One of the most important roles of the mass media is to be the mouthpiece and represent the interests of the common people. It should give voice to the voiceless. And while doing so, media ownership and religious or political affiliation should never act as a setback. Media acts as the mouthpiece of societal issues making us aware of the realities of life. That is what we see, read or hear on the mass media shapes our social reality. This is in accordance with George Gerbner's cultivation theory as he says that exposure to the media, especially television, shapes our social reality.

Media has the potential to meet the needs of the people thereby strengthening the roots of democracy (Dash, 2009). Therefore, the media should bring into light the sufferings and aspirations of people and stories that generate confidence regarding the creative potential of the grassroots whereby media can contribute being a partner in national development (Dash, 2009).

Surveillance

From exposing corrupt practices to hidden deals, the media puts a check on the evils of the society. By pointing out the social, moral and economic evils prevailing in a society, the media can play a significant role in the reconstruction and regeneration of a nation. It can further contribute in eradicating the evils by initiating propaganda against these. Thus the media can contribute immensely in the nation-building activities.

Social Welfare

For ensuring welfare of the public, it is important to promote various institutions at all levels that are responsive, accountable and inclusive. It will empower the poor and vulnerable people to participate effectively in development processes. The media must assist the

society in tackling the diverse problems of corruption, criminal violence, communal conflict, public health and other related issues. Mass media are very important for public health campaign, especially against epidemics and other fast spreading diseases. It plays its part in improving public health efforts by initiating health campaigns to raise awareness. Health and family welfare programs are regular broadcasts of All India Radio. The regional and local radio stations broadcast these programs in their regional languages. These programs cover varied subjects including maternal and child health, drug abuse, AIDS, tobacco consumption, illicit trafficking and other issues involved with the health of the people. Also, for communicating agricultural information to the farmers, media does a significant job. Decades ago in 1966, a project named Krishi Darshan was initiated on experimental basis in Delhi through community viewing of television and thereafter, discussions among themselves. The initiative gained huge success and was able to deliver rich information regarding agricultural practices. Today, in the age of Information and Communication Technologies and New Media, planning, implementation and monitoring of government programs is conducted effectively and in real time through E-governance.

Bridge of Communication

Mass media serves as a bridge between the government and the people. By organizing discussions and debates, media enhances the knowledge of the masses. It provides platforms for intelligent discourses among the public and the policymakers which aids in deciding the priorities and determining the possible pitfalls in the process of implementation. This enlightens the people about the democratic process. Since the media acts as the bridge of communication between the government and the masses, thus it must represent the interests and needs of the common man. Also, the plans and policies of the government have to be effectively communicated to the masses. This way, the media should contribute as being partners in progress.

Social Responsibility

The media professionals as socially responsible persons should serve the public interest and contribute towards national development. The media should work for the betterment of the society and nation, as a whole (Dash, 2009). Media professionals including the owners and managers of the media must realize their social responsibility and provide information that is clean, transparent and reliable. They have the

power to influence public opinion in a positive sense. It is a social responsibility on the part of the media to effectively utilize the power they possess. By doing so, it can strengthen the very roots of democracy.

Agenda Setting

McComb and Shaw rightfully asserted that agenda setting is one of the prime roles of the media, as they decide and publicize news thereby ascertaining more value to particular news compared to the other. The news media possess the power to set a nation's agenda and focus public attention on a few key public issues. The media might not tell the people what to think, but it surely does tell the people what to think about. In other words, the media agenda determines the public agenda. Agenda setting thus exerts immense influence. The media should perform its function by giving assistance in determining what to talk and think about. The media, being the Fourth Estate must remind the political leaders what they owe to the masses and what the people's aspirations are.

Peace Building

Media possess the responsibility towards promoting communal harmony. This is also enshrined in the guidelines issued by the Press Council of India for the journalists. The guidelines of the code of conduct of the Press Council of India state that the role of media in such situations like violence and war is to be peacemakers and trouble-shooters. Thus, media plays a major role in peace-building. It basically means strengthening the prospects of peace and enhancing a society's capability to manage its own conflicts and tensions without violence. Media can play the ultimate role in bringing peace and tranquillity in the society which will preserve the secularity that India boasts of. Media essentially provides a platform to come together to discuss and debate on issues of importance. It must inculcate a feeling of tolerance and understanding for one another. Media in this way can instil the essential ideals of democracy in the people.

The role of mass media in the national building can be enhanced under certain considerations.

1. The Media must be free and independent in order to exert an effective role in nation building. An impartial and free media thus is the utter requirement of a successful democracy.
2. The Media must be professional and objective to succeed in their role. Truth, objectivity, accuracy, balance and fairness are what the media must follow in the execution of their duties.

Freedom of the media must go hand in hand with responsibility. In the rat race of monetary gains and topping the TRP, negativity and sensationalism have become the guiding principles of media today (Singh, 2015). For the media to contribute towards nation-building, it should, first of all, restrain itself from sensationalism and do its rightful duties wholeheartedly. Propaganda, sensationalism, distortions and media vices negatively affect the media's role towards national development. Selectivity and biases on the part of the media can prove to be negative for the society. The media persons have the responsibility to deliver objective facts of any issue. The society can benefit only when the media sticks to the virtues of professionalism, truth, justice and fairness. A socially responsible, enlightened and fearless media can thereby play a decisive role in uplifting the spirit of the nation (Singh, 2015).

Factors Restraining the Media in Nation Building Process

The nature of the media is such that 'bad news is good news'. The media follows this and focuses on the negativities in the country. This can develop a feeling of alienation among the people who think that the country is no good and they start to delink themselves from the state. Nation building in the context of India entails that the mass media should be working towards overcoming the challenges faced by the Indian society.

A lot of false information and rumours are circulated through the media which can trigger variable responses from the masses, especially in this age of New Media. Every now and then the virtual space is filled with fake news doing the rounds. The information people deliver must come from authentic sources and should be verified before dispersal. Internet trolls, fake news and hate speech rule the Internet today. This is of key concern regarding the role of media in nation building.

The media possess the power to transform the whole society as it is said that media can be used as a 'weapon of mass destruction'. Therefore, media should never be used to mislead the people. If so done, it can bring destruction in ways unimaginable.

In India, communal conflict is a serious concern in the path of development or nation-building. Unless there are fraternity and cross-cultural harmony, there can be no nation building (Lakra, 2016). Since independence, communal clashes and riots have continued to disrupt development. A large amount

of money and personnel are required to resolve such disturbances resulting in Government's attention being diverted from the development of the country. Also, ideals of fraternity and harmony, as enshrined in our constitution can only prevail when all sections of the society experience socio-economic, political and cultural justice, liberty and equality (Lakra,2016).

The process of nation-building is a huge task which should be done efficiently and effectively both by the media and the government. The government activities need to be mobilized for achieving the national or societal aims and goals which can be done effectively by the mass media (COE, 2009). The government should also do the needful in order to support the media in the process of building the nation. And, most importantly, while building an identity for our nation, we must not neglect our own peripheries. What is happening in the nooks and crannies of far-flung regions gets very rare attention from the national media. For example, the North East region of the country most of the time feels alienated. Until and unless there is violence in this region, the national media never cares to give a headline or a prime time. This has to change. The very concept of nationality or nationalism which refers to the feeling of oneness must be developed among all the citizens by giving due attention to their concerns which can further contribute towards the process of consolidating the national identity.

Concluding Remarks

A structured panacea cannot really be provided for the complex process of building a nation. But in this process, media certainly has a constructive part in the society. The media plays a pivotal role in maintaining the social structure, values and identity. By effectively fulfilling all its responsibilities, media possess the potential to raise the status of a country. In addition, media professionals need to be responsible and committed towards the society. It is the media who can contribute to eliminating the social vices confronting humanity. They should efficiently attend

to the needs of the society which will aid in enriching the different sectors of the nation. In a multicultural and multilingual country like India, media can retain harmony in the State by attending to the cultural, political, ethnic and religious differences which can prove to be the sources of strength and platform for nation building (Onwumah, 2015).

In 2030, the average age of an Indian will be 29 years and it is very challenging for any country or nation to utilize the human resources for the benefit of the nation. If harnessed for developmental work, they can do wonders and bring laurels for the nation. This certainly builds in us the hope of realizing what researcher Javed Jabbar (2013) said, "The 21st century will be as much an era of building state structures and systems as it will be a period of building and boosting nations to their optimal potential".

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Understanding Initial Four Levels of Bloom's Taxonomy for Setting Question Papers

Mahabir Singh* and Meenal Malik**

Beginning with a brief discussion on Examinations and Evaluation, this paper is for those who act as question paper setters. Importance of Bloom's Taxonomy is discussed with special emphasis on first four Levels. Each Bloom's Level, relevant to written examinations of fixed duration, is discussed with examples of subjective and objective questions. This article is for the purpose of quality improvement in setting questions and shall help as a guide for the examiners.

In the education system, written examinations, internal or external, play an important role in assessing the learning abilities of the students. The quality of any examination mainly depends upon the quality of questions asked for the purpose of assessment. The questions in the examinations should be set in such a manner which covers the entire syllabus and should be able to test whether the candidate has truly an understanding of the course matter or not. Bloom's Taxonomy of educational objectives was developed in 1956 by Benjamin Bloom (1956). Later, Anderson and Krathwohl (2001) modified the Taxonomy to make it more relevant and realistic. Revised Bloom's Taxonomy identifies six levels of competencies which are appropriate for the purpose of educators (Figure 1.) It is hierarchical in nature that means, learning at higher level requires skills attained at lower level.

Assessment Planning

While planning the assessment of student learning, following are some points which need to be considered:

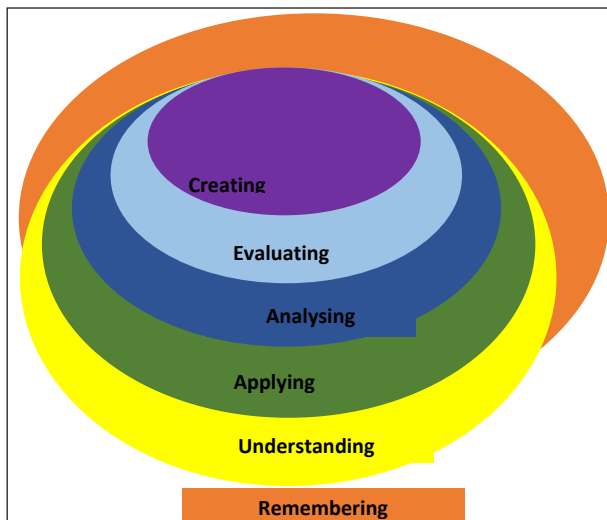
First three learning levels namely *Remembering*, *Understanding*, and *Applying* and to some extent fourth level *Analysing* can be assessed through

- (a) Continuous Internal Evaluation (CIE) using assignments, quizzes and surprise tests etc.

* Controller of Examinations, Deenbandhu Chhotu Ram University of Science & Technology, Murthal – 131039 (Haryana). Email: coe@dcrustm.org

** Assistant Professor in Mathematics, All India Jat Heroes' Memorial College, Rohtak-124001 (Haryana). Email: meenaljalaj@gmail.com

Fig 1. Revised Bloom's Taxonomy

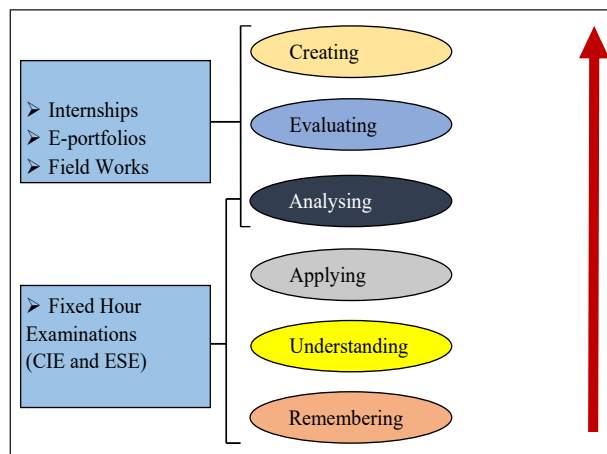


- (b) End Semester Examinations (ESE) which are written examinations conducted after completing the semester.

In these types of examination, students are given limited amount of time to attempt the questions. Figure 2 illustrates the assessment tools and methods using Bloom Taxonomy.

Top three levels i.e. *Creating*, *Evaluating* and up to some extent *Analysing* are to be assessed by extended course works like projects, internship experiences and e-portfolios of students. In the present paper, we are

Fig 2. Assessment Tools for different Bloom's Levels



not focussing on top two levels namely *Creating and Evaluating*.

Adoption of Bloom's Level framework should be implemented at University level for the sake of uniformity and to provide same playing field to all students regarding:

- (a) Mapping of questions in the written examinations with Course Outcomes and then with Program Outcomes.
- (b) Weightage attached to each of Bloom's Level in the Question Papers.

A good quality question paper means it should cover various difficulty levels to accommodate different capabilities of students. Bloom's Levels shall help the paper setter to test different cognitive skills of students without any bias.

Explanation of Bloom's Levels

Remembering:

Suppose a question of following kind is put before the students: -

Who was the Author of the book 'My Experiments with Truth'?

- (a) Jawaharlal Nehru
- (b) Mahatma Gandhi
- (c) Abraham Lincoln
- (d) Nelson Mandela

The answer to above question is obviously (b). To answer above question, one need knowledge and he/she should be able to recall that from his/her memory. Therefore, above question is of Bloom's Level 1 i.e Remembering. Other questions of this level can be set using the action verbs who, tell, define, recall, identify, name, when, where, list etc. The first level therefore is to test the ability of student to recall the information/knowledge he/she has gained during the course of study. Another example of first level may be "Who is Secretary General of United Nation Organisation?"

Understanding:

Let us examine the following question now:

Which of the following is not true about COVID-19 pandemic?

- (a) It happened due to high level of pollution.
- (b) It occurred in non-vegetarians only.
- (c) It happened due to a virus from animal.
- (d) It happened due to bacteria.

Here our purpose is to know how the candidate shall reach at the correct option. It is not a pure knowledge question because it requires the understanding of the concept as well. The candidate who has the understanding of viruses, bacteria etc. shall be able to answer above question, it means it tests the skill of understanding of the candidate. Therefore, it is a question of Bloom's Level 2. Another question of Level 2 can be like; "Explain the concept by which plants are able to generate oxygen during day time." Action verbs to set the questions of Level 2 can be describe, explain, summarise, interpret, discuss etc. which test the ability of student to translate knowledge to new context and understand the information.

Application:

Let us check the following questions:

The Length of one side of a rectangular table is 3.0m and its diagonal is 5.0m long. Applying Pythagoras theorem to find the area of table?

- (a) 15-meter square
- (b) 25-meter square
- (c) 9-meter square
- (d) 12-meter square

Here the student can reach at correct option if he/she has ability to apply the concept of Pythagoras theorem to his/her knowledge about rectangles. Questions starting with verbs like apply, illustrate, solve, use, demonstrate, determine, modify, calculate, model etc. can be set for Bloom's Level 3. To answer the question of Level 3, the candidate has to apply the knowledge and understanding of the concept hidden inside the statement of the question. One more example of this level may be: "Write the steps to prevent an epidemic to spread in your country keeping in view the guidelines issued by World Health Organisation."

Analysis:

Fourth Bloom's Level is to test the ability of Analysis. It requires the skill to break down a problem into parts and then to find a relationship of the parts

and the way the parts are organised. Let us take the following question as an example of Level 4:

The following table-1 represents the relationship between annual income and number of children below 15 years of age of certain families of a locality.

Table 1: Relationship between Annual Income and Number of Children

Sr. No.	Annual Income of family	No of Children with age less than 15 yrs.
1.	Less than Rs 100,000	320
2.	Rs 100,00 to Rs 500,000	200
3.	Rs 500,000 to Rs 700,000	150
4.	Rs 700,000 to Rs 1000,000	80
5.	Above Rs 1000,000	20

From the data in table-1 one can conclude that the families with lower income have more children. The examiner’s question is;

Which of the following assumptions would be correct to justify the conclusion?

- (a) All families are able to send their children to expensive schools.
- (b) The families with lower income group need fee concession for better education of their wards.
- (c) The families with higher income are supporting the families in lower income group.
- (d) Children belonging to the families of higher income are more intelligent than other families.

This question tests one’s ability to have knowledge of value of currency, understanding of fee structure of schools and analysis of the data. Based on these abilities he/she shall tick option (b) as correct answer. One more example of Level 4 can be:

In a class of 10 students, the weights and heights of respective students are given in table-2 below:

Table 2: Weight and Heights of the Student

Weight in Kg.	40	45	70	55	60	38	34	42	40	62
Height in Inch	70	68	60	68	60	68	61	65	70	59

Find the Mean and Standard Deviation and make a statement about the relationship between weight and height of students.

It has already been stated that Level 4 may be tested by extended course works in place of written examinations of fixed duration. The questions of this Level may have action verbs analyse, classify, illustrate, categorise, breakdown, etc. By attempting the questions of Bloom’s Level 4, the candidate demonstrates the skill to breakdown a complex problem into parts and identify the relationship between different parts.

The questions of both types that is subjective and objective (Multiple Choice Questions) can be set with in Bloom’s Taxonomy Framework. Bloom’s Taxonomy is hierarchical in nature and a single question may have multiple Bloom’s Levels. The paper setter must consider the time constraint while setting the questions in this framework because the questions with higher Bloom’s Level need more time to answer in comparison to questions with lower levels.

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Bridging Social Distancing through Online and Open Distance Learning: Scope and Conditions[#]

Debal K SinghaRoy*

In the wake of countrywide lockdown caused by the COVID-19 pandemic outbreak and promulgation of social distancing by the state, there has been growing emphasis since last several weeks on the online learning and use of Open Distance Learning (ODL) mechanisms. Emphasis has been on the use of e-resources, weblinks and electronic media like radio, television, webcasting etc., and social media platforms like Face Book, Skype, WhatsApp, Zoom, Google-real etc., to keep the learning process operational by maintaining social distancing... the unavoidable need of the day. Importantly, teachers, students and educational administrators alike are prompted to use all resources available online through e-pathshala, SWAYAM, e-gyankosh, and interactive social media platforms to deliver lectures, interact with students and fellow teachers and organize meetings etc. Some political leaders and administrators have also come forward to issue directives to the teachers, students, college principals and the university vice chancellors to make extensive use of open distance methodology and programmes like Gyan Vani, Gyan Darshan etc to reach out to the learners. All the teachers are now busy with preparation of lectures for online presentation and delivery through social media and electronic media to serve learner's need on an emergency basis.

Reactive Response

Though these are very timely and welcome moves to maintain continuity of learning of the student without disturbing the academic schedule, to enrich the learning experiences, and to make full use of the technological and educational resources, these moves are only reactive, a response to the emergency situation, and not a proactive one. These are neither properly planned, nor perceptively integrated with the overall educational system as yet. There is a possibility that once the emergency situation is over, the importance which

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* Professor, Department of Sociology, Indira Gandhi National Open University, Maidan Garhi, New Delhi-110068. E-mail: dksingharoy@ignou.ac.in

is momentarily attached to the online and distance mode of learning may get misplaced again within the structured and conventional learning arrangement of the country. Hence, there is a need to put the online learning in proper perspective and not to consider them as provisional, temporary and beck and call arrangements to suffice the exigencies only.

Improved State of Online and ODL Learning in India

Over the last three and half decades, many of the Open Distance Learning (ODL) institutions of the country have acquired recognizable maturity for developing quality study materials by making full adherence to distance education pedagogy. However, its contribution to online course delivery has not been as extensive as has been in conventional ODL programmes mostly because of the strictness of the regulatory authorities of the country on the one hand and perceptive fear of devaluation of academic degrees earned by the learners on the other. Because of concerns for the quality and limited access to ICTs by the learners, most reputed educational institutions in India were not encouraged to offer structured online degree programmes. Despite such concerns however, the online educational resources were of extensive use by most educationists, learners and educational administrators for enriching their expertise and enhance the learning processes. Along the line since last one and half decades the government has encouraged the development of online educational material for SWAYAM (a repository of around 2000 courses), e-pathshala, e-gyankosh etc. platforms providing the opportunity for Massive Open Online Course (MOOC) to a large section of learners. Some institutions have also provided online education in limited areas and levels. Now the scope and conditions for online learning has improved in India and there has been a significant increase as well in the quantum of line learners therein.

In order to democratize education, to suffice growing educational and training needs of the society, and to fulfill the aspiration for further education through flexible arrangement the Open and Distance Learning (ODL) system has been

put in place in the educational arrangement of the country by the government. This system has been capacitated to be flexible and open to reach out to the doorstep of the learners through effective distance mode. It imparts education by using the specially designed printed Self-Instructional Study Materials (SIM) for the learners. While SIM forms the backbone of this system, it also integrates advanced Information and Communication Technologies (ICT) technologies like, audio, videos, new media and face to face counseling for the delivery of the academic programmes. Significantly over the decades, this system has acquired the capacity to make online delivery of SIM course materials, to provide on line academic counseling through webcasting, FM radio and Swayamprabha television broadcasting, Facebook, WhatsApp, Google, Skype, Zooms etc. It is also making use of 'SAKSHAT'—one-stop education portal— EDUSAT network for two-way communication for 'anytime -anywhere' education etc. to facilitate lifelong learning of students, teachers, and those in employment or in pursuit of knowledge. From a mere one distance education institute in 1962, to one Open University, 33 distance education institutions in 1980-81, over the years the strength of the ODL institutes has increased to 256 with 14 Open Universities and 242 Directorates of Distance Education located in regular universities (UGC, 2018).

ICTs, Educational Infrastructure and Emerging Demographic Scenario

India has got a significantly high rate of penetration of ICTs with 56 per cent people getting access to Internet and 86 per cent to mobile phones, (40 per cent smart phones). An estimate suggests that there were 1.6 Million online learners in 2016, and it is expected to grow to about 9.6 Million by the end of 2021. Simultaneously, India now experiences the phenomenal proliferation of higher education institutions across the country with over 1000 universities, 4500 colleges and over 10,000 standalone higher educational institutions (UGC, 2020). Though India has experienced the fast proliferation of higher educational institutions in the post economic liberalisation, the campus facilities or resources would be inadequate even to accommodate even 50 per cent of the regular pass outs. Now over 63.4 per cent of Indian population belongs to working age group of 19-59 years and 65 per cent belongs to the age group of below 35 years

who form the critical mass of an aspiring community for new India.

Towards Proactive Response

The COVID-19 driven social distancing has thrown open new challenges to the education system in general and to the Open and Distance Learning (ODL) in particular and has unfolded new opportunities for both the systems. The significance of the online and distance mode has got reinforced in the crucial hours of human crisis in society. Now that there has a been serious urge for and application of online and electronic media-based learning at all levels, it is imperative that the infrastructure, methodology and content for online learning, modes of integration with conventional ODL and face to face learning, process of evaluation and certification be seriously examined and ensured.

We very often take the pride in the fact that over 56 per cent people in India have got access to internet and 40 per cent people have got access to smart phone. However, digital divide is a fact to be reckoned in India, especially for the rural areas and for the economically weaker sections of the society. Many rural and poor students walk many kilometres to get access to internet kiosks in rural India. Hence, as part of online teaching-learning initiative, it should be ensured first that all learners have access to internet and a personal computer; otherwise the whole motto of uninterrupted education would get misplaced. Provision for free distribution of computer, state subsidized computer and interest free educational loan to purchase computer for the economically vulnerable across the space should be the part of a holistic package of online learning strategy.

To suffice the immediate learning need, the learners are to be encouraged to avail the opportunities of free access to online open educational resources available with National Council of Educational Research and Training (NCERT), e-gyankosh of Indira Gandhi National Open University (IGNOU), SWAYAM, State Open Universities, online library or e-resources arranged by University Grants Commission (UGC) or other bodies. However, to minimise the information overburden of the learners, these materials are to be classified by levels and programmes of studies. From a long run perspective, the study materials for online learning must be pre-

designed and developed into the SIM format; and these are to be of quality ensured by academic bodies. As there may not be simultaneous presence of teachers while studying online, the study materials must be self-contained, self-guided, self-motivated, self-evaluatory and self-motivating. These study materials are also to be made available in various regional languages to suffice the local learners' need in long run. Each lesson should have an audio or video link founded on well planned lectures or/ and presentations.

The regulatory bodies in India have always adopted stringent policies for recognition of open distance learning and online education programmes. These bodies have also identified several disciplines, like medicine, engineering, nursing, law, agriculture etc where laboratory and practical experiments are compulsory, for not offering educational degree either through ODL or online mode. Now that we are living in ICT driven age, and several innovations and sophisticated methods are developed to provide online simulated learning, these bodies should think of giving approval for at least some theoretical components of these subjects to be taught online.

During the normal course of time, the experience, credit, certificate etc earned through online by the learners very often were not given due recognition or weightage. Many of these online curricula have remained standalone packages, without being integrated with the mainstream learning. Now for the fitness of the things, Central Board of Secondary Education, Council for the Indian School Certificate Examinations, various State Boards of Secondary Education, University Grants Commission and universities should think of framing policies for giving choice to the learners to opt maximum of 25 per cent of the total learning online from various other sources, if the learners so desire.

The online learning and the ODL system are posited between the ICT enabled learning environment on the one hand and time-tested wisdom of the regular higher educational institutions on the other. There is a pressing need of mindful and planned integration of the SIM with the MOOCs and other platforms along with the regular academic programmes of conventional universities to enhance the process of quality of mass higher education.

However, such integration must guard against the possibility of devaluation of degrees earned by the distance learners against all odds. Hence, the process of blending be well articulated at the policy level and be recognized by the regulatory bodies in uncertain term.

Each online programme should have an online coordinator to facilitate the learning process of the learners. These coordinators along with other co-coordinators should interact with learners in live time. They should plan innovative and technology enabled the methodology of 'continuous' and 'term /semester/year end' examinations within the overall direction of the academic regulatory bodies of the institute/university. There may be online home-based examination for objective type questions, or even technology regulated open book examination for descriptive type questions.

COVID-19 has prescribed a social situation of distancing as panacea for this ailment. The post corona world is widely going to be a technology driven world. The ICT revolution has already brought India in the threshold of knowledge society augmenting the culture of distance mode of working, socialising, shopping, marketing and learning. Learning is a continuous and long-term human investment. Notwithstanding the threat of pandemic and induced social distancing formal learning process should be continued; and the ICTs enable environment which is available with us should be made use of to the optimum level. As against these backdrops online and ODL learning in its well-articulated form must be integrated with regular and traditional educational arrangements of the country where learning will continue with the barriers of time, space and disaster and social distancing.

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Online Examination in Teacher Education Programmes During Post COVID-19

S K Yadav*

Teachers education is a process for preparing professional school teachers for teaching from pre-primary to higher secondary stages. Necessary knowledge, attitudes and skills for effective teaching are inculcated among them through pre-service and in-service education programme of teacher education. Both the programmes are well planned and are run in about sixteen thousands teacher education institutions and universities on continuous basis whole of the year. During the month of March, 2020, the scheduled activities of teaching and assessments of these institutions were stopped due to sudden occurrence of corona virus disease in our country. It has infected millions of people globally in about 200 countries. It is an acute respiratory disease caused by newly discovered corona virus (SARC-CoV-2). The first case was found in Wuhan in China which was reported by WHO office in China on 31st December, 2019. The symptoms of this disease are illness to pneumonia, fever, cough, sore throat, headache. World Health Organisation (WHO) announced a new name COVID-19 on 11th February, 2020. COVID-19 means a disease caused by a new strain of corona virus in 2019. Keeping in view the consequences of this disease, the Government of India took precautionary measures and declared lockdown on 22nd March, 2020 in the name of *Janta curfew* to make aware and alert about this dangerous disease to the people of our country. This lockdown was extended to 68 days in four phases up to 31st May, 2020. The first was from 25th March-14th April, 2020; second from 15th April-3rd May, 2020; third from 4-17 May, 2020 and fourth from 18-31st May, 2020. During lockdown period, all the teacher educational institutions were closed down. The annual and semester examinations of teacher education programmes were either postponed or cancelled. Traditional examinations were not possible. But after a short duration, an alternate mode of examination was used and shifted from traditional mode of examination to online mode of examination for assessing the

performance of student teachers who have joined different courses of teacher education programmes. An online examination system is a internet computer based test system that measure knowledge, attitude and skills of student teachers. They can give online open book examinations from their own devices at their own time from their home. In open book examination (OBE), student can consult their books and notebooks. They can also consult and use other accepted material for answering questions. The aim is to develop skills and creative thinking among the students. This type of examinations have been recommended earlier in many policy documents. Some of the recommendations are mentioned below.

Policy Recommendations Open Book Examination

National Policy on Education (NPE,1986) recommended re-cast of examination system. In this regard, Programme of Action (POA, 1992) of NPE suggested that innovative ideas like open book examination (OBE), diagnostic evaluation etc. may be experimented with evaluation process and examination reforms. This recommendation was implemented in many places in the country. Yadav (1988) in his study found that OBE was introduced in Uttar Pradesh for evaluating the achievement of students of class IX on experiment basis. The aim was to emphasis command of knowledge as distinguished from recall of factual information, develop skill and creative thinking. It was recommended in the study that OBE should be introduced in other states also. The Gujarat State Board of School Education had also made limited experiment on OBE. Examination of this type seems to be more popular in mathematics, engineering and the sciences. The National Curriculum Framework (2005) recommended that open book exams without time limits are worth introducing as small projects across the country. Theses innovations would have the added advantage of shifting the focus of exams from testing memory to testing higher level of competencies such as interpretation, analysis and problem solving skills. Position Paper on National Focus Group on Examination Reforms (2005) recommended pilot programme on open book exams and resource analysis based assessment without time limit. The exams must gradually move towards on-demand when candidate is

* Former Professor, National Council of Educational Research and Training, New Delhi. Res: House No-70, Sector-15 (Part-1), Gurugram-122001 (Haryana). E-mail: writetosatish51@gmail.com.

ready. A small beginning of this in computer science as a pilot project and its future expansion to mathematics and physics examinations. Yashpal Committee (2009) recommended Graduate Record Examination (GRE) like test needs to be evolved for purpose of university education. GRE is a computer administered test used by many graduate programmes. NCFTE (2009) suggested a modular approach to the development of teacher education curriculum along with a focus on independent study and on-line offering involving interactive modes of learning and consequent modification in the approach to assessment and evaluation has indeed a potential to make education reach the unreached. J. S. Verma Commission (2012) endorsed the above recommendations. In NPE, 2020 online assessment and examinations has been recommended and suggested. Appropriate Bodies like National Assessment Centre or PARKASH (Performance Assessment Review and Analysis of Knowledge for Holistic Development) to be set up for such assessment and examination of students. The above recommendation of online examinations was introduced in many institutions in the country by using various digital tools for conducting online exams during COVID-19.

Platforms for Online Examination & Assessment

Many digital tools for on-line examination are available for assessing the performance of student teachers who are undergoing different teacher education programmes. Some of these are discussed here which can be used during post COVID-19 pandemic period.

MOODLE (Modular Object Oriented Dynamic Learning Environment)

It is an online educational platform that provides personalised learning environments for students. Teachers can create lessons, manage courses, and interact with students. Course materials can be accessed by students from anywhere and at any time. That means they don't to be in classroom or have physical material on hand. MOODLE can be used for conducting the on-line examination to find out performance of students.

Google Forms

It is one of the most useful educational technologies that can be used to create many different types of questions, automatically collects user names, sends data to a spreadsheet, self-grading options, collect any type of data from students/

teachers. In this form, 11 types of question formats are available, namely short answer-one line answers, paragraph-long answers, multiple choice-one answer among different options, check boxes- many answers among options, dropdown-month, year, program are available. Beside these, file upload-photo, multiple choice grid- matrix form with one answer in each row. check box, grid-matrix form with multiple answers in each row date, date of joining, date of birth, etc. are also available.

Google Classrooms

Google classroom aims to simplify, distributing, creating and grading assignments. Classroom is a way to get all students in one place and allows to easily assign work and for students to turn it in. Helps teachers and students to work collaboratively, create and assess assignment, can give feedback, track pending work etc. Teachers can give lectures on google classrooms as well.

SWAYAM (Study Web of Active learning for Young Aspiring Minds)

This programme was initiated by Government of India to achieve the three cardinal principles of Education Policy viz., access, equity and quality. It is an instrument for self-actualisation providing opportunities for a life-long learning. They can choose and access anyone course at any time from hundreds of courses taught in classrooms from 9th class till post-graduation at the university/college/school level. All the courses are interactive and prepared by the best teachers in the country. The courses on SWAYAM have video lecture, specially prepared reading material that can be downloaded/printed, self-assessment tests through tests and quizzes and an online discussion forum for clearing the doubts. Recognition and accumulation of credit earned are to be put in place. Human, material and technological resource support are provided for ensuring quality of these courses.

Coursera, Udemy, Skill Share it etc.

These online platforms are very interactive. Assignments and questionnaire are given at the end of each module. Teachers can also develop such courses by following the guidelines of these platforms.

Easy Class

Easy class is a platform that allows educators to create online classes whereby they can store the course materials online; manage assignments, quizzes

and examinations; monitor due dates; grade results and provide students with feedback all in one place.

BYJU's, Khan Academy, Vedantu, Top Rankers

All of them provide complete course material from K-12 that can be accessed by students at their own pace. The app also tracks student's progress in each lesson. They have their own facilitators and teachers who are teaching here.

Think Exam

It is most most trusted and widely accepted online exam software and can be used to create online tests and allocate assignments to students. It can also create anti-cheat settings.

Class Marker

It is secure, professional web-based Quiz maker, easy-to-use, customizable online testing solution for business, training and educational assessment. Results are automatically graded.

Secretive

It is a smart student response system that empowers teachers to engage their classrooms through a series of educational games and exercises via smart phones and tablets. These apps are super simple and take seconds to load and run. Teachers control the questions and games on their laptop, while students respond and interact through their smart phones/laptops

Hot Potatoes

It includes six applications, enabling you to create interactive multiple-choice, short-answer, jumbled-sentence, crossword, matching/ordering and gap-fill exercises for the World Wide Web. Hot Potatoes can be used for any purpose or project and can be integrated with Moodle.

Besides above, a teacher can host their assignments on these collaborative platforms such as Google Docs, Google Drive, Google Hangouts, MS Teams, Slide Share, Mine craft, Kahoot, Mural, Voice Thread, Edmodo, etc. for learners to collaborate, discuss, listen to others, reflect, assess peers and make it an immersive learning experience.

Status of Online Examination

University Grants Commission has also issued guidelines to universities and given them option to conduct examinations by following any mode on-line,

offline, blended approach for final year students .Many institutions and universities have introduced on-line exams not only for final year students but students for all the classes. They were promoted to next grade or class based on the performance and achievements of online examinations. For example Apeejay Stya University, Sohna, Gurugram, Haryana introduced on-line exams. Moodle (Modular Object Oriented Dynamic Learning Environment) Software was used for conducting annual examinations of all the disciplines including teacher education programmes and students were promoted to next grades on the basis of result of MOODLE. Invigilation work was conducted through Zoom. Yaswant Rao Maharashtra Open University, Nasik conducted on-line exams for all courses of graduate students. Besides these, there are number of universities which conducted online examinations or planning to conduct. Some of these are Delhi University; Amity University, Noida; Guru Nanak University, Amritsar; Punjab University, Chandigarh; Delhi Technical University, Delhi; Ambedkar University, Delhi and Central University of Punjab, Bhatinda IIM, Sambalpur, introduced online examinations for first year students.

Eklavvya is a online exam platform used by many universities, professional training institutes, for their entrance examinations like medical, engineering, management teacher education institutions. Online mode is also used for the purpose of internal assessment of students, collection of examination fee, admission etc.

Online pre-final examinations of first year and second year students of two year Diploma in Elementary Education (D.El.Ed) of District Institute of Education and Training (DIET), Keshavpuram, New Delhi was conducted during COVID-19. Online assessment of multiple choice questions was autograde whereas the essay type questions received through e-mail were evaluated separately by teachers. The students had to complete their examination within prescribed time. The concerned teachers discussed the strengths and weaknesses of students on the basis of the performance of the result of the online examinations.

Prevention of Using Unfair Means

Electronical technology is used for preventing cheating. Cheating on web is harder than in a traditional classroom. AI—Powered Remote Proctoring Technology can conduct examinations even for remote candidates. System capture signature, photograph and

facial recognition of candidate. Proctor U is another digital platform, which integrates webcams with microphones that enables well trained live proctors to monitor and record test takers by watching body language, eye movement, or other physical attributes know to indicate suspicious behaviour. Webcams can also verify physical features like facial structure. Besides these, for preventing unfair practices, variety of tests are set and given to students randomly where questions are to be attempted within set time. Problem solving type questions are generally set for online examinations. Copy and pasting are caught through plagiarism check.

Advantages

There are a number of advantages of online examinations. It will save time; save papers, save trees and save money for buying paper, stationary, printing of papers, arranging logistics at examination centres for conducting exam. There is no expenditure of students on transport because they have to appear in examination from their home. It is cost effective and affordable. It also provides opportunity to students for self-analysis of own abilities and performance, encouragement for learning, create sense of competition, development of personality and confidence.

It is autograde examinations that will grade itself completely and is hassle free auto, confidential and more secure than class examinations. There is no need to arrange invigilators, examinations superintendents, and other staff for conducting examinations. It also provides opportunity to use and consult specialised e-material on examinations-pattern across the globe. Besides these, students become more technology savvy by using computer or mobile devices during on-line examinations.

Disadvantages

Traditional examination shifted to online mode suddenly without any preparation. Students are not familiar to use computer and laptop for online examinations from home. Conducting traditional examinations at centres was not possible. Facilities of online examinations are very poor in remote, rural & tribal areas. In many places, electricity, library, internet, computer and laptop are not available. Beside these, online examination creates fear, health problems, anxiety, stress, pressure, tendency of suicide, loss of confidence, and disinterest in

studies among students. In some cases, online exams are not taken seriously and taken in a casual manner because they are allowed to consult books and notes in answering questions. There are some other instances where, students faced difficulty in finding answers of the questions and consumed a lot of time in finding answers from books and notes. In such situation, they failed to attempt all questions because direct questions are not asked in these examinations. Regarding assessment in open examination system, answers of multiple choice questions are auto grade but in case of essay type questions, it is not autograde and are to be checked by teachers separately. Equality and preparation of all students is difficult to judge.

Suggestions for Action During Post COVID-19

Keeping in view the above, there is a need to revise the system of assessment of both the pre-service and in-service education of teacher education programmes. In this regards, the certain actions are suggested here.

Pre-Service Teacher Education (PSTE)

In pre-service teacher education programme, school teachers from pre-primary stage to higher secondary stages are prepared which are run by teacher education institutions and university departments. But COVID-19 pandemic has changed the teaching and assessment system of examination. In view of this, there is an urgent need to overhaul completely the structure, programmes and policies of all pre-service teacher education programmes namely: Diploma in Preschool Education (DPSE.), Diploma in Elementary Education (D.El.Ed.), Diploma in Physical Education (D.P.Ed.). Diploma in Elementary Education through ODL, Diploma in Arts Education (Visual Arts), Diploma in Arts Education (Performing Arts), Bachelor of Education (B.Ed.), Bachelor of Physical Education (B.P.Ed.), Bachelor of Education through ODL, Bachelor of Education Programme 3 year (Part Time), Master of Education (M.Ed.), Master of Physical Education (M.P.Ed.), Bachelor of Elementary Education (B.El.Ed.), B.Ed-.M.Ed (Integrated 3-Years Course), B.A.B.Ed/B.Sc.B.Ed(4-Years Integrated). NCTE revised and notified on 29th August, 2019 the regulations, norms and standards of Four Year Integrated Teacher Education Programme(ITEP) for preparing art and science teachers from pre-primary to secondary stages. In all the pre-service teacher programmes, the on-line assessment system should be incorporated in all the

four components of teacher education programmes namely theory/foundational papers, assignments/practical, pedagogy and internship and students should be assessed accordingly.

In the same way, there is also a need to revise the course curriculum and structure of Master of Education (M.Ed) programme which is basic qualification of teacher educators who are responsible for preparing school teachers of different stages. Online mode of examinations and assessment should be introduced in Master of Education (M.Ed) Programme.

In –Service Education

Our country has a strong mechanism and networking of teacher education institutions from national level to school level for providing in-service education to different target groups for their growth and development. Generally cascade mode is followed in the training programme and their performance was assessed by following traditional method like pre and post tests. But COVID-19 pandemic has changed the scenario of teacher education programmes. The traditional mode of in-service education provided in institutions and universities was discontinued suddenly due to COVID-19. The mode of in-service education was shifted from traditional face to face mode to online mode. The participants had to attend these programme from their home through online mode. They will have to be assessed through online mode.

At present, our country is having more than 1000 universities, 16000 teacher education institutions, 66 Human Resource Development Centres (HRDCs) in universities, 38 Institutes of Advanced Studies in Education (IASEs), 110 Colleges of Teacher Education (CTEs), 29 State Council of Educational Research and Training (SCERT), more than 650 District Institutes of Education and Training (DIETs), Block Resource Centres (BRCs) and Cluster Resource Centres (CRCs). There are other national level organisations like National Council of Educational Research and Training (NCERT), New Delhi which are responsible for conducting professional development programmes for teachers, teacher educators and other personnels. These teacher education institutions and universities should organise online orientation and capacity building programme for students, teachers, teacher educators, administrators and parents for making them aware

about consequences of COVID-19 and for assessing their performance by using online tools. Different types of e-material and modules on this issue should be prepared and used in these programmes. Some modules are suggested below:

- Module on online training transaction for assessing the trainees should be developed. In the module, training methodology should focus on assessment of local specific activity based training approaches. The transactions of training for conducting online exams should focus on audio/video demonstration of skills, competencies, interventions and strategies followed by group discussion, group reflection; panel discussion; brain storming sessions etc. Digital platforms like Eklavya, MOODLE, SWAYAM, which provide opportunity for conducting online examinations should be part of this module.
- Module on conducting online examinations after opening schools, colleges, universities and teacher education institutions after post-COVID-19 period should be prepared. The module should include MHRD, NCERT, NCTE, UGC Guidelines and different strategies for continuance of online study during post COVID-19 period is to be mentioned. The mode of blended learning should also be part of this module.
- Module on strong mechanism for monitoring, evaluation and followup of in-service training programmes through online mode should be developed. Various digital platforms should be part of this module. This will help to diagnose the strength, weaknesses and outcome of the programme with corrective measures for optimizing the effectiveness of the programme.

By way of conclusion, it is stated that there is an urgent need to take new initiatives by the Government of India, state governments and national institutions like NCTE, UGC, NCERT to popularise the online examination through teacher education programmes so that future challenges to be occurred during post COVID-19 can be faced. The government should create digital infrastructure in teacher education institutions particularly in rural areas or where such facilities are not available. More e-material for online examinations should be developed by these institutions and should be made available to all stakeholders. Well in advance necessary preparation should be made for implementation of PM eVidya Yojana and implementation of recommendations of National

Policy of Education 2020. Modality for using blended learning and assessment to be worked out before normalcy take place. In this regard, there is a need to have deep thinking and action on the part of both policy planning and implementation at micro and macro level.

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Technology: A Sublime Combination of Wisdom and Innovation

K Radhakrishnan, Chairman, Board of Governors, IIT Kanpur and Former Chairman, Indian Space Research Organisation (ISRO), Bengaluru delivered the Convocation Address at the 7th Convocation of Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, Chennai on 13th July, 2019. He said, “My dear young friends, this is your day and importantly, a day of your life to express gratitude to your parents for their sacrifices to support your pursuits and to bow in reverence to the teachers for shaping you. A new world of opportunities and challenges will unfurl in front of you now. I believe that 'Knowing' and 'Doing' are important for professional success; but 'Being' what you are, your character and conscience will elevate you as emulable ones. Each one of us could live up to leave a legacy and make a difference for the society around us, our nation and the humanity at large.” Excerpts

With great delight, I stand before this promising audience today, on the momentous occasion of the 7th Convocation, to greet the graduates of the year; to congratulate them for this coveted academic distinction and to wish them all a very bright and prosperous tomorrow.

Friends, I admire IIITDM, Kancheepuram for its yeomen contribution in the very first decade towards building national competency for design and manufacturing in a variety of technology domains. I am delighted to see the emphasis placed by your institute for education in smart manufacturing and the inter-disciplinary pursuits in research. I believe your efforts will contribute to channelize the immense inventive power of our youth to imbibe and transform scientific and technical knowledge to cost-effective and reliable processes, products and services with utility, reliability and competitiveness in the domestic and global market place. This is the need of the hour for India.

Technology Advances Exponentially

Several of us present here, belong to a generation that witnessed induction of integrated circuits and microprocessors; emerging global value chains of silicon semiconductor devices; advances in information theory, digital communications and broadcasting systems.

Technology leaders around us are familiar with Moore's Law on doubling of processing powers every two years and similar ones on capacity of storage devices; network bandwidth; information transmittable over a given amount of radio spectrum

We saw significant spread of internet and mobile telephony and the advent of digital economy.

Multitudes of applications that the World Wide Web continues to instigate our everyday life with a world full of possibilities but with aggravated challenges on privacy, security, control of standards, interoperability, etc.

Wireless mobile communication phone technologies have grown rapidly to the fourth generation (4G) technology of LTE and Wi-Fi, with capability for mobile multimedia, 'anytime/anywhere' service, global mobile support, integrated wireless solutions and customised personal service. World is engrossed in the process of transition to 5G technologies and their add-on with mobile cloud computing and mobile edge computing. A further step to the superfast 6G technology with satellite networks of telecommunication, remote sensing and navigation; and possibly space roaming with 7G are in the horizon.

Advances in material science, artificial intelligence, automation, robotics, optics and mechatronics lead to seismic shifts in manufacturing technologies.

Convergence of neuroscience and the physical sciences of engineering, information technology and robotics in a creative alliance, is one of the most exciting developments of the recent times. New domains such as computational neuroscience, cognitive neuroscience, neuro-informatics, and neural transplantation are cases in point. The scenario of living neurons communicating with silicon devices has path-breaking implications, thereby enabling future computers that could harness the non-linear information processing dynamics of neurons and thereby becoming truly intelligent. World is rapidly

moving towards brain-inspired intelligent robots with visual cognition, computing and motion control.

It is heartening that several academic institutions and R&D Agencies in India have made commendable foray into these frontline technologies, besides the fact that many Indians abroad are driving some of these innovations and technological disruptions.

Design and Manufacturing form the Bedrock of India's Space Endeavour

It is well recognised globally that the hallmark of India in Space is the focus on its helpfulness for humankind through Earth-oriented Satellites and an effective institutional tie up with all stakeholders to evolve and sustain national systems. Exploring outer space continue to excite and enrich us.

In this pursuit, self-reliance has been our obsession, not just an objective. That is evident from Indian strides in satellite technology and launcher technology. Let me elaborate:

- i) Aryabhata satellite, built in 1975 at the industrial sheds of Peenya, was a bold step by India into a frontline domain attempted by very few industrialised nations then. Creditably since then, India made a strong imprint globally with more than 100 contemporary satellites built for communication, navigation, remote sensing, meteorology, climate studies, astronomy as well as exploration of Moon and Mars.
- ii) The first Indian rocket RH-75, that took off as a projectile, from Thumba in 1967 weighed 32 kg. That is history. Fast forwarding to the present, India owns the globally acclaimed PSLV, a GSLV that is reliable now and a superior launcher GSLV Mk3. Our GSLV Mk3, weighing 640 tons, lifted off in November, 2018 and precisely orbited an advanced communication satellite GSAT-29 of nearly 3420 kg mass.
- iii) The highlight is that India has mastered the complex technologies and achieved self-reliance in access to outer space. All Indian satellites, except a few heavy communication satellites, are lofted by the Indian launchers. Also, we launched close to 300 satellites for 33 countries on commercial basis.

These accomplishments give credence to Indian capability for (i) rocket propulsion including cryogenics technology, (ii) polymers and chemicals; (iii) space materials, structures and mechanisms; (iv)

navigation, guidance, control; (v) power and thermal control systems; (vi) telemetry, tele-command, tracking systems; (vii) optical and inertial sensors; (viii) communication and navigation transponders, imaging radars, optical imaging systems; and more importantly in (a) systems design, system engineering and system management; (b) mission design, modelling and simulation; (c) integration, check-out and launch operations and (d) safe operations of satellites in space environment, all thru its long life of 10-15 years.

These accomplishments signify (i) India's capabilities to conceive, design, manufacture and deploy complex and large high technology systems on an end-to-end basis and (ii) confluence of ISRO and Indian space industry for enhancing capability and capacity. It is noteworthy that the Indian space industry, evolved from mid-1970's, is quite vibrant with nearly 150 firms now- large medium, small and micro in both public and private sectors- partnering with ISRO to build launchers and satellites. Indian Space-industry has been growing in its value chain from jobbing to delivery of systems. Our frequency of launch is growing exponentially, thanks to the capacity built in the industry. Innovative industrial processes and techniques (e.g. additive manufacturing) are being adapted into space manufacturing.

India is on the threshold of human spaceflight and complex interplanetary exploration which will open up enormous a challenge and host of opportunities to the new generation.

Information Technology Pervades All Phases of Our Space Endeavour

Software is as important as the hardware, quite decisive for the success of any space mission. The software that we use on-board a space vehicle or on ground, synthesises the integrated and comprehensive knowhow of the complete mission, supported by understanding of diverse disciplines including mathematics, physics, chemistry, engineering and computer science. The plethora of data captured by our space exploration missions and remote sensing satellites are analysed to extract knowledge products and services using signal processing techniques, AI and machine learning.

When we launch a satellite on-board a launch vehicle, the position and velocity information are processed by sophisticated algorithms running on

frugal hardware that navigate and guide the launch vehicle. The mathematical foundation for describing navigation systems and their integration include the use of coordinate transformations and several statistical techniques which are to be interpreted into the guidance software for finally issuing the control commands.

Once the satellite is injected into the specified orbit around Earth, precise determination of its orbit and attitude is essential for all further operations of tracking systems and commanding to keep the satellite in the specified orbit and attitude. This is just classical mathematics.

For Chandrayaan-1 mission, for the first time, we took a spacecraft beyond Earth's Orbit. We made it traverse to a distance of almost 400,000 km to orbit another celestial object. We placed it very precisely in a circular orbit of 100 km around Moon.

In the case of Mars Orbiter Mission (aka Mangalyaan), there was a tough target of navigating the spacecraft to be at 500 km on arrival at Mars (take or leave 50 km for inaccuracy band); that too after a traverse of 660 Million kilometres and this had to be predicted precisely 300 days ahead! It was executed with commendable precision. The handle rested in the safe hands of mathematicians and specialists in flight dynamics.

Chandrayaan-1 and Mars Orbiter Mission tested our ability for precise navigation into deep space and for the tricky capture of the orbit of these celestial bodies. Some of the technological innovations dictated by our space exploration missions have been beneficially deployed for the operation of Earth-oriented application satellites.

Chandrayaan-2, with an Indian Lander-Rover combine, is India's first step in Robotic Space Exploration and the mission is on the anvil. Obviously, this mission is more intricate. The Lunar lander orbiting Moon at a speed of around 6000 kmph, must have autonomous capability to brake its speed and steer itself for a soft and safe landing in an uncharted terrain of Moon, that too precisely at a designated site. Moreover, all these operations would happen within 16 minutes and the landing site also has to be ascertained by itself while on its descent. The entire nation is looking towards it.

What drives the Team ISRO for such quantum leaps? It is belief in ourselves; it is team excellence; it is the learning from the past missions both failures and successes; it is the sublime combination of the wisdom of elders and innovative power of younger generation; it is preparedness for all imaginable scenarios; it is transformational leadership at all levels.

Let me wrap up. My dear young friends, this is your day and importantly, a day of your life to express gratitude to your parents for their sacrifices to support your pursuits and to bow in reverence to the teachers for shaping you. A new world of opportunities and challenges will unfurl in front of you now. I believe that 'Knowing' and 'Doing' are important for professional success; but 'Being' what you are, your character and conscience will elevate you as emulable ones. Each one of us could live up to leave a legacy and make a difference for the society around us, our nation and the humanity at large.

Let me wish you all the very best in your future endeavours. □

CAMPUS NEWS

International Webinar on Futures of Education

A two-day International Webinar on 'Futures of Education: Learning to Become' was organised by the School of Education in collaboration with Centre for Disability Studies and Educational Research, Netaji Subhas Open University (NSOU), Saltlake, Kolkata through Google Meet, recently. Various luminaries from various institutions across India and overseas were the cherished academicians during the event. Around 180 participants registered for the webinar; out of which, 60 were paper presenters while others actively participated in the two-day International Webinar on the digital platform.

During Inaugural Session, Dr. Papiya Upadhyay, Joint Organizing Secretary delivered her introductory speech. At the very outset, she expressed good wishes for the Webinar as conveyed by the Vice Chancellor, NSOU. Prof. Sanat K Ghosh, Convenor of the Webinar extended a warm and hearty welcome to all dignitaries, guests, delegates, and participants along with the objectives of the present event on the web platform to set the pace of discourse in the seminar. To situate the tempo of the webinar further, Prof. Swapan Kr Sarkar, Head, School of Education presented the thematic introduction of the webinar in brief. The renowned educationist, Prof. Marmar Mukhopadhyay was the Keynote Speaker. He diligently spoke on learning to become and digital imperatives in a very crisp and eloquent way. Sri. Sachindra Ch Kar, Finance Officer, NSOU delivered a short speech on the significance of such webinar as an academic fruitful initiative in this despondency. Presidential address was delivered by Dr. A N Dey, Chairman, IW Director, School of Education, NSOU and Coordinator, Centre for Disability Studies and Educational Research (CDSER).

Further, the Plenary Session was chaired by Prof. Abhijit Kr Pal, Head, Department of Education, West Bengal State University and Prof. Bishnupada Nanda, Head, Department of Education, Jadavpur University. Dr. T S Powdyel, Former Education Minister, Royal Government of Bhutan spoke on 'Education as a Noble Sector'. Other two speakers were Prof. Madhu Parhar, Director, CEMCA, New Delhi and Devishobha R,

Founder, Kidskintha and Representative, UNESCO who spoke on 'ICT and Education' and 'Untethering Education-Initiatives and Possibilities', respectively.

The next Plenary Session was chaired by Prof. P K Biswas, Former Director, STRIDE, IGNOU New Delhi and Prof. Sumanta Chattaraj, Professor, School of Education, NSOU. Mr. Tarush Jain, Founder and Director, Brainwiz, New Delhi and Representative, UNESCO delivered his speech on 'Futures of Education-Learning to become: An Overview'. Dr. Narengam Rajib Kr Singh, Principal Institute of Rural Education (College of Teacher Education), Wangjing, Manipur spoke on 'An Outlook: Transforming Education by the Content Curriculum into Developmental Process for Future'. The speech on 'Impact of Research and Education for the Future' was delivered by Dr. Taposh K Biswas, Professor, Institute of Education and Research, Dhaka University, Bangladesh. This was followed by the interactive session. Numerous questions/ observations were raised and aptly addressed by the eminent speakers and audience participants one at a time. The resource speakers had ice breaking deliberations and threadbare discussions on emerging issues and the prerogative areas of futures of Education.

Dr. Papiya Upadhyay acted as a moderator for the entire day's activities on the digital platform. Prof. Sanat K Ghosh scrupulously summed up the day's deliberations and reminded the significant addresses. Dr. Upadhyay, Assistant Professor and Organizing Secretary of the event proposed the Vote of Thanks.

Next day commenced with the opening words by Dr. Parimal Sarkar, Joint Organizing Secretary. Special Audio address by Prof. A K Jalaluddin, Former Advisor, UNDP/UNESCO, South East Asia was played. The twenty minutes audio was a narrative on rapid changes in the various national and international socio-political sectors and their interrelatedness in the developmental aspect. Prof. Jalaluddin put thrust on the last three centuries of development and role of education thereto. He hinted on the present goals of Education, i.e., meaning making education. He also narrated on the comprehensive Goals of Education in Nation Building: Individual and Social Goals

in Particular. The session was coordinated by Prof. Sanat K Ghosh. This was followed by the Technical sessions/ Paper Presentation.

Dr. Abhedananda Panigrahi, Coordinator, B.Ed., School of Education, NSOU was the Moderator. Prof. Debasri Banerjee, Department of Education, University of Calcutta was the Panelist. In total, 29 papers were presented during the session. During next session, Dr. Parimal Sarkar, Joint Organizing Secretary, IW and Assistant Professor, School of Education, NSOU was the Moderator. Prof. Dibyendu Bhattacharya, Head, Department of Education, University of Kalyani was the Panellist. Total number of papers presented during the session were twenty seven. Dr. Papiya Upadhyay Moderated the next session of the day. Session Coordinator was Prof. Anirban Ghosh, Director, CIQA and Director, I/c SPS and SVS, NSOU. Prof. Debabrata Debnath, Head, Department of Education, University of Gourbanga and Dr. K N Chattopadhyay, Head, Department of Education, University of Burdwan were the Panelists. Thirty papers were presented in the session. The sessions were followed by interactions among the participants and the panelists on some basic questions. Prof. Sanat K Ghosh summed up the activities and outcomes of the sessions. Dr. Parimal Sarkar proposed the Vote of Thanks.

Advanced Functional Analysis and Its Applications, 2020

A nine-day Online Workshop on ‘Advanced Functional Analysis and Its Applications, 2020’ is being organized by IIT Hyderabad in a joint collaboration with Department of Mathematics, National Institute of Science Education and Research (NISER), Bhubaneswar during December 16-24, 2020. Research scholars perusing research in various fields of Functional Analysis are encouraged to register for this workshop. Aim of the event is to bring together all researchers working in this field from India and abroad. People from various parts of the world are invited to deliver talks in the event. A special attention is paid to the area ‘Analysis on Banach Spaces’. The prime objective is to cover some advanced topics in Functional Analysis at its introductory level. Apart from the application viewpoints, the subject Functional Analysis can be studied in its own interests. The central theme of this event is to offer some advanced topics in Functional Analysis with special emphasis on Analysis on Banach

spaces. From the time of Stephan Banach to till date the theory has long heritage and culture. The richness of this theory attracted many people to work in it. The Handbook of Geometry of Banach Spaces (I & II) encounter the developments of the literature in last few decades. The following online platform would be used for this Workshop.

- Google Classroom for the recorded lectures.
- Microsoft Teams for sending queries to the instructors.

For further details, contact Organising Secretary, Indian Institute of Technology Hyderabad, Kandi, Sangareddy, Telangana-502205. E-mail: afaa20.application@gmail.com. For updates, log on to: www.iith.ac.in

Virtual Workshop on Data Science for Agriculture and Natural Resource Management

A One-day Virtual Workshop on ‘Data Science for Agriculture and Natural Resource Management’ is being organized by The Indian Society of Agricultural Information Technology (INSAIT) in collaboration with Ahmedabad University as a part of the International Conference on ‘Big Data Analytics 2020’ (<https://www.bda2020.org/>) to be held at Ashoka University, Sonapat, Haryana during December 15-18, 2020. The event addresses challenges and issues related to Data Science in Agriculture and Natural Resource Management, data mining of weather or crop production data for estimation or prediction of disease, tools, and data mining for the prediction models to solve the problem and develop frameworks for data mining in a specific domain of agricultural databases. The Researchers, Scientists, Professionals, Academicians, Students (PhD, MS, MTech), Government officials, Industry personnel may participate in the event. The Topics/ Areas of the event are:

- Agricultural Data Model Including Sensing and Reliability in Agriculture.
- Big Data Analytics, and Cloud Computing for Agriculture.
- Data Science and Data Mining Techniques for Analysis of Agriculture Data.
- Data Science-Based Decision Support Systems for Natural Resource Management.
- Innovations in Agriculture and Sensing Devices

in Smart Farming.

- Knowledge Based Agriculture Data Models for Smart Computing in Agriculture.
- Precision Agriculture for Smart Farming Solutions.
- Security and Privacy for Big Data in Agriculture.
- Geo-Big Data Platforms and Solutions for Smart Agriculture.
- Data Science and Geoportals for Location-Based Services in Agriculture.
- Geospatial Standards, Interoperability and Knowledge Discovery in Agriculture.
- Data Science in High Performance Plant Breeding.

For further details, contact Organising Secretary, Indian Society of Agricultural Information Technology or Ahmedabad University, Navrangpura, Ahmedabad-380009, Gujarat, E-mail: dsanrm2020@gmail.com. For updates, log on to: <https://sites.google.com/view/dsanrm2020>

Online Faculty Development Programme on Next Generation Computing

A five-day Online Faculty Development Programme on 'Next Generation Computing: Machine and Deep Learning Applications' is being organized by the National Institute of Technology, Warangal during January 04-08, 2021. The programme is open to faculty and student participants / research scholars of all engineering, colleges, and other allied

disciplines in India. Industry personnel working in the concerned/allied discipline may also participate.

The programme is designed with the state-of-the-art concepts of Machine Learning, and Deep learning technology that comprises of theory as well as hands-on sessions. Half of the course is designed for theory, use-case demonstrations, and research oriented discussions, which will be helpful in understanding the process; and the remaining 50 per cent course for practical implementation (hands-on). In brief, the programme covers AI, Machine Learning Concepts, Types of Learning, Applications of Machine Learning, Deep Learning. The objective is to address modern trends in the field of Artificial Intelligence with real time problem solving. The Major Course Contents are:

- Data Visualization.
- Machine Learning Techniques.
- Classification: Logistic Regression.
- Decision Trees, Random Forests.
- Deep learning: CNN, RNN.
- Reinforcement Learning.
- Research Issues Challenges.

For further details, contact Coordinator, Dr. Raju Bhukya, Assistant Professor, Department of Computer Science and Engineering, NIT Warangal-506 004, Mobile :09700553922, 08332969733, E-mail: raju@nitw.ac.in. For updates, log on to: www.nitw.ac.in/ □

THESES OF THE MONTH

SCIENCE & TECHNOLOGY

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

AGRICULTURAL & VETERINARY SCIENCES

Genetics & Plant Breeding

1. Solanke, Anita Chandrabhan. **Generation mean analysis in aromatic rice (*Oryza sativa* L).** (Dr. P B Patel), Department of Genetics and Plant Breeding, Navsari Agricultural University, Navsari.

Veterinary Science

1. Balayya, Swami Santosh. **Clinical studies on common haemoprotozoal diseases with special reference to molecular epidemiology of *Theileria* and its therapeutic management in Gir cows.** (Dr. J S Patel), Department of Veterinary Medicine, Junagadh Agricultural University, Junagadh.

BIOLOGICAL SCIENCES

Bio Science

1. Karthikeyan, C. **Exploration of biological and electrochemical processes for environmental remediation.** (Dr. S Maruthamuthu), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

2. Sijil, P V. **Accumulation of omega-3 fatty acid rich lipid in indigenous freshwater microalgae and biochemical mechanisms involved.** (Dr. V S Chauhan), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Biotechnology

1. Kure, Sandip Ramesh Rao. **In vitro studies on two economically and biologically important taxa: *Vernonia anthelmintica* L and *Dipcadi saxorum* Blatt.** (Dr. B S Surwase), Department of Biotechnology, Swami Ramanand Teerth Marathwada University, Nanded.

2. Manpreet Kaur. **Adoption of aquatic weeds for sustainable biofuel production.** (Dr. Sarita Sachdeva, Dr. Manoj Kumar and Dr. S K Puri), Department of Biotechnology, Manav Rachna International University, Faridabad.

3. Radfan, Ahmed Abdulghani Abdulwahab. **A comparative study on virulence factors of *Candida albicans***

under hyphal form induced by different inducers. (Dr. G B Zore), Department of Biotechnology, Swami Ramanand Teerth Marathwada University, Nanded.

Botany

1. More, Sanjay Ashroba. **Studies on influence of Bt-crops with special reference to Bt-cotton on soil microflora in Marathwada Region.** (Dr. B D Gachande), Department of Botany, Swami Ramanand Teerth Marathwada University, Nanded.

2. Nag, Swagata. **Molecular characterization and differential expression of Phenylalanine Ammonia Lyase (PAL) gene from *Vanda coerulea* Griff.ex lindl.** (Prof. Suman Kumaria and Prof. Pramod Tandon), Department of Botany, North Eastern Hill University, Shillong.

3. Pandey, Bhoopendra Kumar. **Exploring the role of alternative splice variants of CAMTA1 in stress physiology of *Arabidopsis thaliana*.** (Dr. Samir V Sawant), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

4. Pandey, Janhvi. **Studies on phytoremediation potential of aromatic grasses with special emphasis on lemongrass (*Cymbopogon* species) in tannery sludge polluted soil.** (Dr. Saudan Singh), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

5. Seram, Devika Devi. **Cryopreservation strategies and in vitro propagation of *Aquilaria malaccensis* Lam.** (Dr. Meera C Das and Prof. Suman Khatri Kumaria), Department of Botany, North Eastern Hill University, Shillong.

Life Science

1. Megha Lal. **Molecular mechanism of dysregulation of MiR-379/656 at DLK1-D103 locus in human cancers.** (Dr. Anurag Agrawal), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

2. Srivastava, Ankita. **Effect of prenatal exposure of lindane during postnatal brain development in rat offspring and understanding their response when rechallenged at adulthood.** (Dr. Devendra Parmar), Faculty

of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Marine Science

1. Satpathy, Shreemayee. **Bioaccumulation of toxic metals in the trophic levels of marine ecosystem: A risk assessment.** (Dr. B S Jena), Faculty of Biological Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Microbiology

1. Bhatt, Hitarth Bhagirathbhai. **Molecular diversity, protease gene profiling and cloning studies on the haloalkaliphilic/haloalkalitolerant bacteria isolated from the Little Rann of Kuchch, Gujarat.** (Dr. S P Singh), Department of Microbiology, Saurashtra University, Rajkot.

Zoology

1. Koner, Debaprasad. **Effects of zinc oxide nanoparticle and its bulk counterpart on oxidative stress in the air-breathing catfish clarias batrachus (Bloch).** (Prof. Nirmalendu Saha), Department of Zoology, North Eastern Hill University, Shillong.

2. Philayung, Z A S. **Studies on the diversity of helminth parasites in edible fishes of Manipur.** (Prof. Bishnupada Roy), Department of Zoology, North Eastern Hill University, Shillong.

3. Rajesh Kumar. **Antifertility efficacy of aqueous leaf extract of aegle marmelos (Linn) on seminal quality of swiss albino mice.** (Dr. V N Singh), Department of Zoology, T M Bhagalpur University, Bhagalpur.

EARTH SYSTEM SCIENCES

Geology

1. Patil, Abhijit Jaysingrao. **Geological and geomorphological study of Kumbhi River Basin, Kolhapur District, Maharashtra, India.** (Dr. H S Patode), Department of Geology, Swami Ramanand Teerth Marathwada University, Nanded.

ENGINEERING SCIENCES

Biomedical Engineering

1. Gupta, Meena. **Analysis of cognitive studies on cerebral palsy employing repetitive transcranial magnetic stimulation, neurofeedback and cognitive exercises.** (Dr. Dinesh Bhatia), Department of Biomedical Engineering, North Eastern Hill University, Shillong.

Chemical Engineering

1. Sinha, Noopur. **Computational approaches and drug discovery in target based therapy.** (Dr. Ram Rup

Sarkar), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Civil Engineering

1. Jujjuri, Usha Kranti. **Experimental investigation on strength of concrete by the replacement of fine aggregate with copper slag.** (Dr. Kota Srinivasu), Department of Civil Engineering, Acharya Nagarjuna University, Nagarjuna Nagar.

2. Nirmala, S. **Strength and durability studies on self compacting concrete with recycled concrete aggregate and M-sand.** (Dr. R Veera Sudharsana Reddy and Dr. C Sashidhar), Department of Civil Engineering, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

Computer Science & Engineering

1. Bhatt, Bhumika Haresh. **An innovative framework for remote database experimentation.** (Dr. Jyoti Pareek), Department of Computer Science, Gujarat University, Ahmedabad.

2. Chudasama, Hetal Tulsidas. **Event based video summerization for cricket.** (Dr. Narendra M Patel), Department of Computer Science & Engineering, Charotar University of Science and Technology, Anand.

3. Hajar, Esmaeil Qasem Assuhbani. **Effective use of data mining for discovering anomalies from firewall logs.** (Dr. S D Khamitkar), Department of Computer Science, Swami Ramanand Teerth Marathwada University, Nanded.

4. Jain, Anamol Chand. **An analysis of gateway congestion control in computer networks.** (Prof. Vinodini Katiyar and Dr. Ashendra Kumar Saxena), Department of Computer Application, Teerthanker Mahaveer University, Moradabad.

5. Kamble, Vijendra Prabhakar. **Operational analysis of crime information using GIS.** (Dr. Nilesh K Deshmukh), Department of Computer Science, Swami Ramanand Teerth Marathwada University, Nanded.

6. Manish Kumar. **An analytical study on issue of security through W-Lan & its applications.** (Dr. Kalpana Sharma and Dr. SBL Tripathi), Department of Computer Science, Bhagwant University, Ajmer.

7. Nair, Preeti. **Development of an improvised technique for classification of data mining.** (Dr. Indu Kashyap), Department of Computer Science & Engineering, Manav Rachna International Institute of Research and Studies, Faridabad.

8. Sonar, Deepali Namdevrao. **Studies on identification of lung cancer cell using artificial neural networks.** (Dr. U V Kulkarni), Department of Computer Science & Engineering, Swami Ramanand Teerth Marathwada University, Nanded.

9. Srivastava, Saurabh Kumar. **A robust performance evaluation model for text classification based on input characterization and feature selection.** Department of Computer Science & Engineering, Jaypee Institute of Information Technology, Noida.

Electrical & Electronics Engineering

1. Dahiya, Vineet. **Analysis of doubly fed induction generator based wind energy conversion using direct matrix converter.** (Dr. Leena G), Department of Electrical & Electronics Engineering, Manav Rachna International Institute of Research and Studies, Faridabad.

2. Khurana, Sujata. **Enhancement of power system stability by artificial intelligent techniques.** (Dr. Leena G), Department of Electrical & Electronics Engineering, Manav Rachna International Institute of Research and Studies, Faridabad.

3. Lamba, Ram Prakash. **Studies of coaxial and radial multichannel pseudospark discharge configurations for high power switching applications.** (Dr. Ram Prakash), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

4. Mahendra Singh. **Development of a feasible model of waste to energy conversion system.** (Dr. Leena G), Department of Electrical & Electronics Engineering, Manav Rachna International Institute of Research and Studies, Faridabad.

5. Mallika, K Lakshmi. **.Development of machine learning algorithm to forecast ionospheric time delays using Global Navigation Satellite System (GNSS) signals.** (Dr. D Venkata Ratnam and Dr. Sarvana Raman), Department of Electronics & Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

6. Verma, Rajendra Kumar. **Design analysis and performance enhancement of spatial harmonic magnetrons for high frequency applications.** (Dr. Shivendra Maurya), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Electronics & Communication Engineering

1. Gorla, Venkata Ganesh. **Design, simulation and modeling of Radio Frequency Microelectromechanical (RF-MEMS) switches for tunable bandpass filters.** (Dr. K Srinivasa Rao), Department of Electronics & Communication

Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

2. Israni, Dippal Prabhudas. **Occlusion modelling and multi object tracking with identity retention in visual sequences using feature descriptors.** (Dr. Hiren Mewada), Department of Electronics and Communication Engineering, Charotar University of Science and Technology, Anand.

3. Mahant, Keyur Kamaldasji. **Substrate integrated FMCW radar system using SIW technology.** (Dr. Hiren Mewada), Department of Electronics & Communication Engineering, Charotar University of Science and Technology, Anand.

4. Nayak, Dilip Kumar. **Fault monitoring and diagnosis of mineral processing equipment using signal processing techniques.** (Dr. Debi Prasad Nayak), Department of Electronics & Communication Engineering, Siksha O Anusandhan University, Bhubaneswar.

5. Palla, Ravikumar. **Enhancement of wider impedance bandwidth with microstrip patch antennas for wireless communications in 5G applications.** (Dr. K Kumar Naik), Department of Electronics & Communication Engineering, Koneru Lakshmaiah Education Foundation, Guntur.

6. Shaveta. **Synthesis and optimization of reversible logic based circuits.** (Dr. Dipali Bansal), Department of Electronics & Communication Engineering, Manav Rachna International Institute of Research and Studies, Faridabad.

Electronics & Telecommunication Engineering

1. Sadalage, Jyoti Arun. **Sediment classification of tropical littoral water using sonar system.** (Dr. Arnab Das and Dr. Y V Joshi), Department of Electronics & Telecommunication Engineering, Swami Ramanand Teerth Marathwada University, Nanded.

Information & Communication Engineering

1. Jha, Monica. **Functional module extraction from gene expression data using data mining techniques.** (Dr Swarup Roy and Dr. A K Maji), Department of Informational Technology, North Eastern Hill University, Shillong.

Instrumentation Engineering

1. Sadala, Satyanarayan Pocham. **Investigation of some sliding mode control strategies for uncertain systems.** (Dr. B M Patre), Department of Instrumentation Engineering, Swami Ramanand Teerth Marathwada University, Nanded.

2. Sharma, Rohit. **Investigation on surface finish and subsurface damage in brittle materials for optical**

applications. (Dr. Vinod Karar), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

3. Shom, Saikat Kumar. **Design and performance evaluation of different control frameworks for piezoelectric actuator aiming precision positioning.** (Dr. Arpita Mukherjee), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Material Science & Engineering

1. Asihvarya. **Anaerobic bioleaching of oxidic manganese minerals using dissimilatory metal reducing bacteria.** (Dr. M K Ghosh), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

2. Balaji, U. **Design and development of structurally coloured titanium surfaces by anodisation.** (Dr. S.K. Pradhan), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

3. Dash, Pranita. **Study on preparation and characterization of graphene oxide and reduced graphene oxide from high purity natural graphite.** (Dr. S K Biswal), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

4. Dash, Swagatika. **Modelling and simulation studies on solvent extraction of lanthanum and neodymium.** (Dr. Swati Mohanty), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

5. David, Roshita. **Synthesis and characterization of zinc aluminium based alloys and its TiC composites on mechanical properties and wear behaviour.** (Dr. Rupa Dasgupta), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Mechanical Engineering

1. Akhtar, Mohd Afroz. **Performance of phase-locked loop (PLL) based synchronization techniques under different grid disturbances.** (Dr. Suman Saha), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

2. Chokshi, Sagar Ramchandra. **Mechanical characterization and modelling of unidirectional fiber reinforced polymeric composites.** (Dr. Piyush P Gohil), Department of Mechanical Engineering, Charotar University of Science and Technology, Anand.

3. Choudhari, Ajit Madhukarrao. **Mechatronic system design for the disabled using man machine interface.** (Dr. J V L Venkatesh), Department of Mechanical Engineering, Swami Ramanand Teerth Marathwada University, Nanded.

4. Singh, Puran Mal. **Finite element analysis of piston, engine block and exhaust muffler of an internal combustion engine using simulation technique.** (Dr. Debashis Parmanik), Department of Mechanical Engineering, Manav Rachna International Institute of Research and Studies, Faridabad.

5. Venkatesh, B. **Experimental analysis of various emission control techniques in diesel engines with and without using biodiesels as fuel.** (Dr. C Prasanthi), Department of Mechanical Engineering, Jawaharlal Nehru Technological University Anantapur, Ananthapuramu.

Physical Engineering

1. Goel, Vikas. **Physico-chemical characterization of atmospheric particles: Implications to aerosol optics.** (Dr. S K Mishra), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

Structural Engineering

1. Keerthana, M. **Experimental and numerical investigations on wind induced instabilities of bridge deck sections.** (Dr. P. Harikrishna), Faculty of Engineering Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

MATHEMATICAL SCIENCES

Mathematics

1. Girase, Pradip Bhimsing. **A study of algebraic and topological aspects of lattice modules.** (Dr. V C Borkar), Department of Mathematics, Swami Ramanand Teerth Marathwada University, Nanded.

2. Hoda, Md Najmul. **A study of aluthge transform of operator.** (Dr. Md Abid Ansari), Department of Mathematics, T M Bhagalpur University, Bhagalpur.

Statistics

1. Deka, Deepshikha. **A study on transmuted exponentiated Gumbel distribution.** (Dr. Bhanita Das), Department of Statistics, North Eastern Hill University, Shillong.

2. Kanchan Kumari. **Issues in query processing over XML data sources.** (Dr. Sachindra Kumar Azad), Department of Statistics and Computer Application, T M Bhagalpur University, Bhagalpur.

3. Singh, Vaidehi. **Classical and Bayesian inferential procedures in various life testing models.** (Prof. Surinder Kumar), Department of Applied Statistics, Babasaheb Bhim Rao Ambedkar University, Lucknow.

MEDICAL SCIENCES

Dermatology

1. Hegde, Parameshwar R. **A study on the diagnosis of skin diseases using machine learning as a complementary approach.** (Dr. Manjunath M Shenoy), Department of Dermatology, Yenepoya (Deemed to be University), Mangaluru.

Neurology

1. Kamboj, Kautuk. **ERK activation and growth factor signalling: Relevance for synaptic plasticity and memory.** (Prof. Shiv Kumar Sharma), NBRC, National Brain Research Centre, Manesar.

Optometry

1. Chowdhury, Partha Haradhan. **Effect of ocular deviation on lifestyle.** (Dr. Nitin V Trivedi), Department of Optometry, Gujarat University, Ahmedabad.

Physiotherapy

1. Dave, Dhruvkumar P. **Effect of aerobic exercise versus progressive resisted exercise on glycosylated haemoglobin (HbA1c) in person with type 2 diabetes mellitus.** (Dr. Ali Rani), Department of Physiotherapy & Sports Medicine, Charotar University of Science and Technology, Anand.

PHYSICAL SCIENCES

Chemistry

1. Anita Rani. **Synthesis, characterization and biological studies of novel schiff bases and their transition metal complexes.** Department of Chemistry, Maharishi Markandeshwar University, Ambala.

2. Bindu, Hima. **Supramolecular thermoreversible hydrogels and organogels: Synthesis, structure-property relationships and applications.** (Dr. P Aruna), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

3. Borude, Kailash Radhakishan. **Equilibrium studies in transition metal complexes of new drugs and important amino-acids.** (Dr. Khade B C), Department of Chemistry, Swami Ramanand Teerth Marathwada University, Nanded.

4. Chingbiaknem, Esther. **Computational studies on H- bonded segments of some inter-macromolecular complexes.** (Prof.R H Duncan Lyngdoh), Department of Chemistry, North Eastern Hill University, Shillong.

5. Dhalape, Vitthal Manik. **Development of novel analytical methods, validation and its stability indication study of different active pharmaceutical ingredient**

using modern analytical techniques. (Dr. R V Pinjari), Department of Chemistry, Swami Ramanand Teerth Marathwada University, Nanded.

6. Diamai, Siewdorlang. **Studies on colorimetric sensing of metal ions and organic molecules using gold and silver nanoparticles.** (Dr. D P S Negi), Department of Chemistry, North Eastern Hill University, Shillong.

7. Galani, Sunil Manjibhai. **Synthesis, characterization and catalytic activity on Zn and Ce based nanostructured materials.** (Dr. Subhash Chandra Ghosh), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

8. Gogoi, Gayatri. **Processing of lignocellulosic biomass of North East India in ionic liquid and role of membrane technology for recovery of value added products.** (Dr Swapnali Hazarika), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

9. Gopathi Ramu. **A synthetic study towards 3-ylidene oxindoles ring expansion & synthesis, biological evaluation of imadazo pyridine based heterocyclics.** (Dr. B Nagendra Babu), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

10. Gupta, Sharad. **Exploring metal oxide nanostructures for CO₂ hydrogenation.** (Dr. C P Vinod), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

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14. Mansingh, Sriram. **Investigation on oxygen vacancy mediated ceria based photocatalytic materials for energy and environmental sustainability.** (Prof. Kulamani Parida), Department of Chemistry, Siksha O Anusandhan University, Bhubaneswar.

15. Mehta, Dhruvi Rajeshkumar. **Thermodynamic studies of metal complexes of selected drugs with some essential metal ions by conductometry, spectroscopy and ultrasonic techniques.** (Dr. M M Maisuria), Department of Chemistry, Gujarat University, Ahmedabad.

16. Mohd Adil Shareef. **Synthesis and biological studies of imidazo, indolo and indenopyrazole fused heterocyclics as potential chemotherapeutic agents.** (Dr. B. Nagendra Babu), Faculty of Chemical Sciences, Academy of Scientific and Innovative Research, Ghaziabad.

17. Nagargoje, Ganpat Ram. **Synthesis, characterization and application of new pyrimidine derivatives.** (Dr. N A Kedar), Department of Chemistry, Swami Ramanand Teerth Marathwada University, Nanded.

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19. Pasupuleti, Bala Gangadhar. **Novel 1,2,4-trioxane and 1,2,3-triazole derivatives: Studies on synthesis and biological activity.** (Prof. Ghanashyam Bez), Department of Chemistry, North Eastern Hill University, Shillong.

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Physics

1. Adhikari, Smriti. **Dynamical behavior of some molecular and condensed systems.** (Dr. S S Khatri), Department of Physics, North Eastern Hill University, Shillong.

2. Anand, Madhulika. **Analysis of the thermal expansion in minerals under the effect of high temperature.** (Dr.

Jagdhar Mandal), Department of Physics, T M Bhagalpur University, Bhagalpur.

3. Chettri, Prajwal. **Graphene oxide and its composite derivatives: A multifunctional application platform.** (Dr. Archana Tiwari), Department of Physics, Sikkim Manipal University, Gangtok.

4. Gunaram. **Design and development of planar antennas for modern communication system.** (Dr. Vijay Sharma), Department of Physics, Bhagwant University, Ajmer.

5. Kalimulla. **Thermoacoustic and spectroscopic studies on certain liquid mixtures at different temperatures.** (Dr. Shaik Babu), Department of Physics, Koneru Lakshmaiah Education Foundation, Guntur.

6. Lawriniang, Bioletty Mary. **Measurements and calculations of high energy proton (3.5-30 MeV) and alpha (8-60 MeV) particle induced reaction cross-sections of structural materials (Zr, Nb, Fe, Ni) and isotopes (Y, Mo) used for medical purposes.** (Prof. B M JYrwa), Department of Physics, North Eastern Hill University, Shillong.

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8. Shaik Md, Ibrahim. **Studies on molecular interactions in some mixtures through ultrasonic and maximum Eigen value techniques.** (Prof. S Sreehari Sastry), Department of Physics, Acharya Nagarjuna University, Nagarjuna Nagar.

9. Valeo, Visuzoto. **A multiple probe study of global atmospheric electric circuit with special reference to the weather and climate in Meghalaya.** (Prof. P V Koparkar), Department of Physics, North Eastern Hill University, Shillong.



GUJARAT VIDYAPITH : AHMEDABAD – 380 014
Employment Notification No. 05/2020-2021

Gujarat Vidyapith invites applications from interested candidates for different Non-Teaching posts. Online application shall be available on Gujarat Vidyapith's website www.gujaratvidyapith.org; www.gujaratvidyapith.ac.in from 05/11/2020 - 11.00 AM to 05/12/2020 - 05.30 PM, and the print of the filled-in online application is to be routed through proper channel (wherever applicable) so as to reach the "Recruitment Cell, Gujarat Vidyapith, Ashram Road, Nr. Income Tax, Ahmedabad – 380 014", on or before 11/12/2020 by R.P.A.D./Speed Post/Courier or in-person in Central Office, Gujarat Vidyapith, Ahmedabad-380 014. Detailed advertisement is available on the aforesaid website.

Date : 17/11/2020

I/c. Registrar



Dr. Rafiq Zakaria Campus
Dr. Rafiq Zakaria Centre for Higher Learning & Advanced Research

Dr. Rafiq Zakaria Marg, Rauza Bagh, Aurangabad-431001
 (Non Grant in Aid Minority Institute)

Telephone: 0240 - 2381102

Walk in Interview

Following posts are to be filled in our institute on Fix Pay/CHB Basis to teach PG Courses, for the academic year 2020 – 21. Eligible candidates shall attend Walk in Interview on, **Tuesday, 15-12-2020** at 10:30 am at Dr. Rafiq Zakaria Centre for Higher Learning and Advanced Research, Dr. Rafiq Zakaria Campus, Aurangabad with two Xerox copies of their testimonial along with originals.

Sr. No.	Name of the Subject	No. of Posts
1	Chemistry	Two
2	Analytical Chemistry	Two
3	Industrial Chemistry	Two
4	Botany	Two
5	Zoology	Two
6	Mathematics	Two
7	Computer Science	Two
8	Microbiology	One
9	English	Two
10	Urdu	Two
11	Sociology	Two

Eligibility criteria as per UGC, University and Government of Maharashtra norms. **Number of posts are liable to be changed.** In – service candidates should bring N.O.C. from working institute. No TA/DA will be paid to candidates for attending the interview.

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RECRUITMENT CELL

Ref: Advt. No: PU/RC/2020/33/RN/38

Dated: 06.11.2020

**RECRUITMENT OF ADMINISTRATIVE
POSITIONS (RENOTIFICATION)**

Pondicherry University is now reopening the earlier advertisement **through Online mode only** (earlier operated as Offline mode) for fresh applicants for Administrative positions as follows:

Sl. No.	Name of the Posts	No. of Posts	Level
01	Deputy Registrar	8 (3-UR, 2-OBC, 1-SC, 1-ST, 1-Tenure*)	12
02	Assistant Registrar	6 (3-UR (1-PwBD#(c)), 2-OBC, 1 –EWS)	10

(*on contract for a period of two years) (# to be filled by (C) Locomotor disability including cerebral palsy, leprosy cured, dwarfism, acid attack victims & muscular dystrophy)

For further details, regarding Minimum Qualifications, Desirable Qualifications, Eligibility criteria, Online Application Form, General Instructions, Terms and Conditions, etc., please visit the University website: recruitment.pondiuni.edu.in.

The last date for submission of online applications and updation of additional credentials by Offline mode is **27.11.2020 5.00 PM (IST)**. The last date for receipt of Hard Copy of Applications from fresh applicants is **01.12.2020**.

REGISTRAR (i/c)



SHRI VISHWAKARMA SKILL UNIVERSITY

(State University enacted under the Government of Haryana Act 25, 2016)

Advertisement No. SVSU/2020/ESTT. /T/007

Recruitment Notification

Shri Vishwakarma Skill University (SVSU), Dudhola, Palwal (Haryana) is India's first Government Skills University established by the Government of Haryana by Act 25, 2016. The University is running various skill courses such as - Certificate, Diploma, Degree, Post Graduate Degree/Diploma, Skill Ph.D. etc. based on its dual education model, where apprenticeship/ On the Job Training (OJT) has been integrated with the class room training.

Offline applications are invited from eligible applicants for appointment on following **Academic positions upto 18.12.2020 (05:00 pm):**

S. No.	Subject/ Branch	Skill Professor		Skill Associate Professor	
		No. of Posts	Category	No. of Posts	Category
1.	Civil Engineering	0	-	1	01(SC)
2.	Computer Science Engineering	2	01(UR), 01(BCA)	0	-
3.	Electronics Engineering	1	01(UR)	0	-
4.	Electrical Engineering	1	01(UR)	2	02(UR)
5.	Physics	0	-	1	01(Gen)
6.	Mathematics	0	-	1	01(EWS)
7.	English	0	-	1	01(SC)
8.	Remote Sensing/Geographic Information System (GIS)	0	-	1	01(BCA)
9.	Public Health	0	-	1	01(Gen)
10.	Psychology	0	-	1	01(SC)
11.	Management	1	01(SC)	3	02 (UR), 01(BCA),
12.	Hotel Management	0	-	1	01(Gen)
13.	Agriculture Science	1	01(SC)	0	-
14.	Agriculture Engineering	0	-	1	01(BCB)

Pay Levels and qualifications for the posts will be as per UGC norms. For detailed terms and conditions, please visit on University's website at www.svsu.ac.in. The last date for receiving applications in duly prescribed format to the office of - "The Deputy Registrar (Estt.), Shri Vishwakarma Skill University, Plot No. 147, Sector 44, Gurugram, Haryana-122003" is **18.12.2020 (05:00 pm)**. Incomplete applications and applications received after last date will be rejected.

(Registrar)



Dr. Rafiq Zakaria Campus Maulana Azad College of Arts, Science & Commerce, Dr. Rafiq Zakaria Marg, Rauza Bagh, Aurangabad 431001 Tele 0240-2381102

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Appointments

Following posts of teaching staff on Fix Pay/CHB (Non Grant Courses) are vacant in our College for the academic year 2020-21. Eligible candidates shall submit their application along with Xerox Copies of their documents to Principal, Maulana Azad College, Dr. Rafiq Zakaria Campus, Rauza Bagh, Aurangabad through Speed Post/in person or on email macprincipal@gmail.com on or before **05-12-2020**.

Sr	Name of Subject	Nature of Posts	Course	No. of Posts
1.	Chemistry	Fix pay	P.G.	02
2.	Analytical Chemistry	Fix pay	P.G.	02
3.	Industrial Chemistry	Fix pay	P.G.	02
4.	Computer Science	Fix pay	P.G.	02
5.	Mathematics	Fix pay	P.G.	02
6.	Commerce	Fix pay	P.G.	02
7.	Geology	Fix pay	P.G.	02
8.	English	CHB	P.G.	02
9.	Microbiology	Fix pay	P.G.	02
10.	Biotechnology	Fix pay	P.G.	02

Sr	Name of Subject	Nature of Posts	Course	No. of Posts
11.	MPM	Fix pay	P.G.	02
12.	BBA	Fix pay	U.G.	03
13.	B. Com E com	Fix pay	U.G.	03
14.	B.C.A.	Fix pay	U.G.	04
15.	B.C.S.	Fix pay	U.G.	04
16.	B.Sc. Biotechnology	Fix pay	U.G.	04
17.	Psychology	CHB	U.G.	02
18.	Economics	CHB	U.G.	02
19.	Physical Education	CHB	U.G.	02
20.	NCC	CHB	U.G.	02

- Numbers of posts are liable to be changed and Management's decision for filling up the posts will be final.
- Eligibility criteria as per the UGC, University and Government of Maharashtra norms.
- If qualified candidate (NET/SET/PhD) are not found then candidate with PG will be considered subject to University approval.
- All the appointments are subject to the approval of Dr Babasaheb Ambedkar Marathwada University, Aurangabad
- The post are purely for one academic year 2020-21
- Selected candidates will be paid a fix monthly salary till the end of academic year 2020-21
- Online / in person interviews will be conducted as per Govt. of Maharashtra directives.
- No TA/DA will be paid to candidates for attending interview.

Dr. Mazahar Farooqui
Principal



SHRI VISHWAKARMA SKILL UNIVERSITY
(State University enacted under the Government of Haryana Act 25, 2016)

Advt. No. SVSU/2020/Estt./T/008

Date 11/11/20

Recruitment Notification

Online applications are invited from eligible applicants for filling up the various **Teaching Posts** Through Direct Recruitment up to 18.12.2020. For details of posts along with prescribed qualifications, eligibility criteria and selection criteria, please visit the University website www.svsu.ac.in

Posts: Skill Assistant Professor (Academic Pay Level 10)					
Sr.	Subject	Posts	Sr.	Subject	Posts
1	Mechanical Engineering	06 (3-Gen,1-EWS,1-BC-A, 1-BC-B)	13	Psychology	1(SC)
2	Civil Engineering	1 (SC)	14	Physical Education	1 (UR)
3	Computer Science Engineering	05 (3-UR,1-EWS, 1-BC-A)	15.	Political Science	1 (UR)
4	Electronics Engineering	03 (UR)	16.	Music	1 (SC)
5	Electrical Engineering	03 (2-SC,1 SC-ESP)	17.	Medical Laboratory Technology	1 (UR)
6	Physics	1 (PWD-Gen)	18.	Management	06 (4-UR,1 SC, 1-SC-PWD)
7	Mathematics	02 (1-EWS,1-BC-B)	19.	Commerce	1 (BC-A)
8	English	02 (1-UR,1-BC-A)	20.	Statistics	1 (ESM-Gen)
9	Environmental Studies	01 (BC-B)	21	Economics	1 (UR)
10	Chemistry	01 (SC)	22	Hotel Management	1 (UR)
11	Remote Sensing/ Geographic Information System (GIS)	01 (EWS)	23	Agriculture Science	02 (1-BC-A,1-EWS)
12	Public Health	01 (UR)	25	Food Technology	1 (SC)

Applicants willing to apply for the advertised post are advised to apply online through the link available on the University website www.svsu.ac.in between the opening date **13.11.2020** and closing date **18.12 .2020 (12:00 midnight)**.

After successful submission of application form in online mode, the filled application form must be printed and signed on each page by the applicant. Such signed copy of application form along-with all supporting self-attested documents should be sent at the following address by 28/12/2020: **“The Deputy Registrar (Estb.), Shri Vishwakarma Skill University, Plot No. 147, Sector 44, Gurugram, Haryana-122003”**

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E-mail IDs : publicationsales@aiu.ac.in / advtn@aiu.ac.in / subsun@aiu.ac.inWebsite : <http://www.aiu.ac.in>

The payment to Association of Indian Universities may be made using any of the following modes :

- A. IN CASH :** The required amount could be remitted directly to our Saving Account in any branches of Canara Bank.
- B. DEMAND DRAFT ONLY :** Such instrument is required to be prepared be in the name of “ASSOCIATION OF INDIAN UNIVERSITIES” (payable at New Delhi), preferably from the Nationalised Banks ONLY.
- C. CHEQUES OF ANY KIND ARE NOT ACCEPTABLE.**
- D. Also, the Demand Drafts of Banks falling under the categories of “Grameen”, ‘Sahakari’, Co-operative and alike are NOT ACCEPTABLE.** Hence, Colleges/ Institutions/ Universities may send the requisite amount by NEFT/RTGS through these banks for crediting the amount directly to our Account.
- E. NEFT/RTGS/Net Banking/BHIM/G-pay/UPI, AIU Web Portal, etc.:** The requisite amount could be transferred for its direct remittance to our Saving Account by NEFT/RTGS/Net Banking/BHIM/G-Pay/UPI, etc. using the following data:

1	Bank Account No.	0158101000975 (Saving)
2	Beneficiary Name	Association of Indian Universities
3	Address	16, Comrade Indrajit Gupta Marg New Delhi – 110 002
4	Bank & Branch Name	CANARA BANK DDU MARG
5	Bank's Address	“URDU GHAR” 212, Deen Dayal Upadhayaya Marg New Delhi – 110 002
6	MICR Code	110015005
7	Branch Code	0158
8	IFSC Code	CNRB 0000158
9	PAN NO.	AAATA0407F
10	GST Regn. No.	07AAATA0407F1ZG
11	Contact No.& E-mail ID	(011) 23230059 Extn. 208/213 Mob : 9818621761 E-Mail IDs : advtn@aiu.ac.in (Advertisement), subsun@aiu.ac.in (Subscription) & publicationsales@aiu.ac.in

NOTE : In case of **Cash Deposit and Transfer via NEFT/RTGS**, the proof of payment as **Cash Deposit Slip** and the **UTR Number for NEFT/RTGS** may be communicated **IMMEDIATELY BY MAIL** for its linking and settlement at our end including the Complete Name & Address of the University/Institute/Organization, etc please.