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प्रमुख
एन.जी. लक्ष्मीनारायण

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डॉ. अंकिता मिश्रा

वरिष्ठ परामर्श संपादक
राधाकान्त अंथवाल

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सभी पाठकों को नववर्ष 2022 की हार्दिक शुभकामनाएं

• 'आविष्कार' नेशनल रिसर्च डिवेलपमेंट कारपोरेशन (एनआरडीसी) द्वारा प्रकाशित विज्ञान और प्रौद्योगिकी की लोकप्रिय विज्ञान मासिक पत्रिका है। • 'आविष्कार' में किसी लेख के प्रकाशन हेतु चयन के संदर्भ में संपादक का निर्णय अंतिम होगा। प्रकाशित लेखों और लेखकों द्वारा भेजे गए चित्रों की मौलिकता के संबंध में लेखक स्वयं उत्तरदायी होंगे। • 'आविष्कार' में प्रकाशित सामग्री का किसी भी रूप में उपयोग करने से पूर्व संपादक की अनुमति लेना आवश्यक है। • 'आविष्कार' में प्रकाशित किसी यांत्रिक, वैद्युत, इलेक्ट्रॉनिक आदि युक्ति के काम न करने की स्थिति में पत्रिका/एनआरडीसी उसके लिए उत्तरदायी नहीं होगी। • 'आविष्कार' में प्रकाशित विज्ञापनों में किए गए दावों के लिए पत्रिका और एनआरडीसी उत्तरदायी नहीं होगी।

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समानमस्तु वो मनो यथा वः सुसहासति॥ ऋग्वेद

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दराज के मित्रों एवं भारत के
विभिन्न राज्यों में फैले सुधी पाठकों
से निवेदन है कि समिति के
प्रकाशन की निरंतरता बनाये रखने
के लिए अपनी सहयोग राशि पूरी
उदारता के साथ भिजवाने का
अनुग्रह करें। आज किसी भी
पत्रिका का प्रकाशन बहुत मुश्किल
काम है मगर समिति अपने पूर्ण
सेवा भाव के साथ अनौपचारिका
को पिछले ४७ वर्षों से निरंतर
निकाल रही है। सभी प्रबुद्ध पाठक
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हिन्दुस्तान टाइम्स का प्रकाशन था। ऐसी स्थिति में हम कटिबद्ध हैं कि
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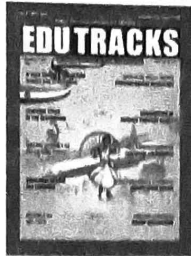
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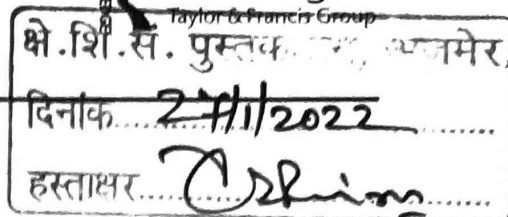
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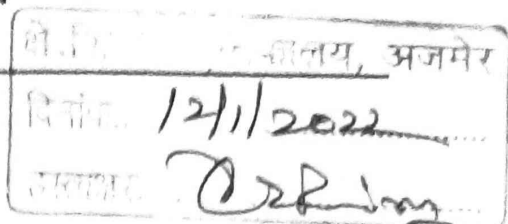
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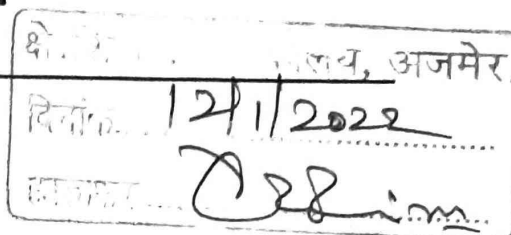
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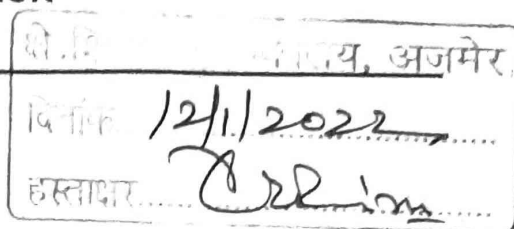
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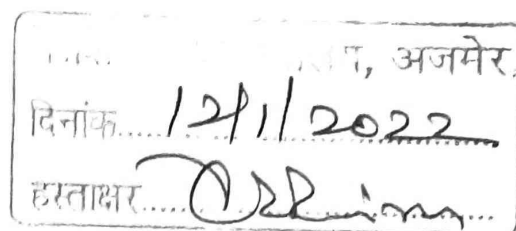
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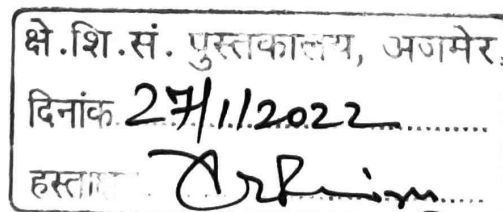
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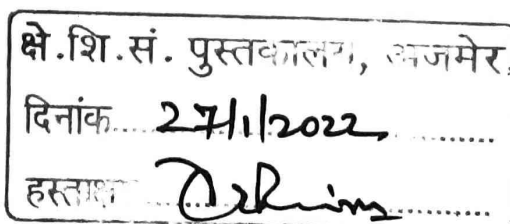
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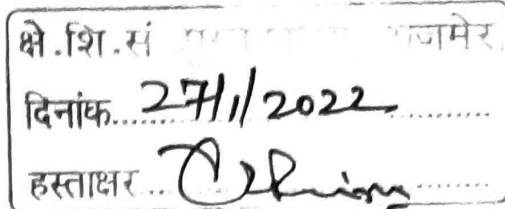
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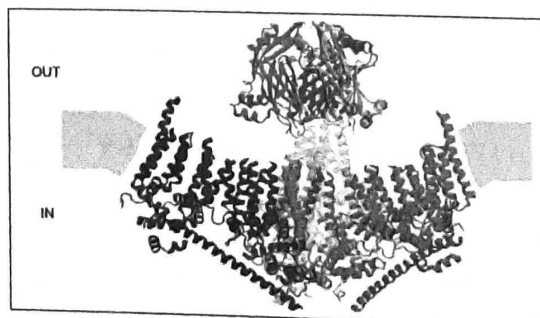
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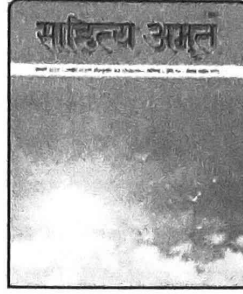
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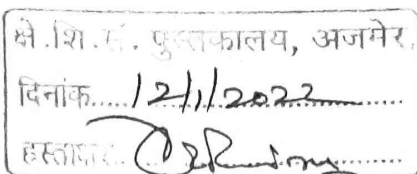
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For all practical procedures described in *SSR*, we have attempted to ensure that:

- the requirements of UK health & safety law are observed;
- all recognised hazards have been identified;
- appropriate precautions are suggested;
- where possible procedures are in accordance with commonly adopted model risk assessments;
- if a special risk assessment is likely to be necessary, this is highlighted.

However, errors and omissions can be made, and employers may have adopted different standards. Therefore, before any practical activity, teachers and technicians should always check their employer's risk assessment. Any local rules issued by their employer must be obeyed, whatever is recommended in *SSR*.

Unless the context dictates otherwise it is assumed that:

- practical work is conducted in a properly equipped laboratory;
- any mains-operated and other equipment is properly maintained;
- any fume cupboard operates at least to the standard of CLEAPSS Guide G9;
- care is taken with normal laboratory operations such as heating substances or handling heavy objects;
- good laboratory practice is observed when chemicals or living organisms are handled;
- eye protection is worn whenever there is any recognised risk to the eyes;
- fieldwork takes account of any guidelines issued by the employer;
- pupils are taught safe techniques for such activities as heating chemicals or smelling them, and for handling microorganisms.

Readers requiring further guidance are referred to:

Safeguards in the School Laboratory, 12th edn, ASE, 2020.

Be Safe! Health and Safety in School Science and Technology for Teachers of 3- to 12-year-olds, 4th edn, ASE, 2011.

Topics in Safety, ASE, latest version on the ASE website: www.ase.org.uk/resources/topics-in-safety (login required).

Hazcards, CLEAPSS, latest version, and other relevant publications, on the CLEAPSS website: www.cleapss.org.uk (almost all schools, colleges and teacher training establishments in the UK outside Scotland are members, as are many overseas).

Hazardous chemicals database, SSERC, latest version on the SSERC website: www.sserc.org.uk/health-safety/chemistry-health-safety/hazchem_database-2/ (schools, colleges and teacher training establishments in Scotland).

Preparing Risk Assessments for Chemistry Project Work in Schools & Colleges, SSERC, 2020.

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#Let'sBeatCoronaTogether

Onset of Entrepreneurial Universities in India

Varghese Panthaloorkaran*

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

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

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

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

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Promoting Quality Culture in Higher Education Institutions: Role of System and Leadership

M R Kurup*

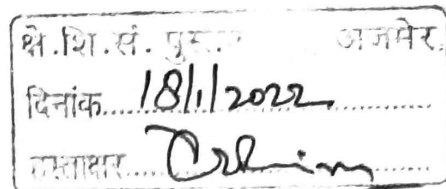
India is the third largest Higher Education System in the world today. According to list provided by UGC, there are 1019 universities in India as on 22nd November, 2021. This includes Central universities, State universities, recognized national institutions like Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs), Indian Institute of Science (IISc), etc. besides, nearly 400 private universities, some of them set up by Corporate Leaders like Shiv Nadar, Azim Premji, Ambani, among others. However, majority of students are in colleges numbering over 45,000 spread across the country. These institutions together account for over 20 million enrolments of students, almost equally divided between male and female. As many as 4 million students are enrolled in Indira Gandhi National Open University (IGNOU), New Delhi and if we take into account the 13 State Open Universities and a large number of Institutions of Distance and Open Learning (IDOL) of major universities, almost 7 to 8 million students, almost 35 to 40 per cent of gross enrolment in India, could be in the Open Learning System.

It is equally important to note that out of 1019 universities, only 381 (37%) are under Section 12(B) of UGC Act, eligible for receiving government grant in aid. It implies that 63% of universities do not receive any Central or State Government grant. The situation is almost the same in case of colleges as well. Not even 40% of colleges are listed under section 12(B). The governments have failed to allocate even 6 per cent of GDP for education in India.

Despite being the third largest in system the world, the present Gross Enrolment Ratio in higher education in India is a mere 27%, against over 90 per cent in UK and 86 per cent in USA. Students are constrained to take admission despite wide variety of subsidies offered to students, besides reservation of seats for socially and economically weaker sections of the society. Reservation of seats varies from State to State. If it is 50 per cent in some States, it goes to 70 per cent in some other States. Young people prefer to enter the labour market to support their families, rather than enroll for higher education. Another reason could be the perceived deficiency in quality and relevance of the higher education system. The educated find it difficult to link their education to career opportunities. An indicator is the very high unemployment among the educated. The focus should be more on Quality than Quantity. If the quality and relevance of education offered by the institution is good, even those who plan to go abroad for higher studies will also come forward to seek admission in India.

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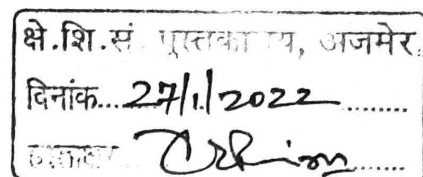
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