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INFLUENCE OF DIELECTRIC SCREENINGS ON PHONON FREQUENCIES AND ACOUSTIC PROPERTIES OF Pd-BASED BULK METALLIC GLASSES

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The phonon dispersion curves for bulk metallic glasses (BMGs) Pd₄₀Ni₁₀Cu₃₀P₂₀ and Pd₆₄Ni₁₆P₂₀ are computed for the longitudinal and transverse phonon frequencies using the simple model given by Bhatia and Singh. Different dielectric screening functions are employed for the longitudinal mode. We obtain the values of the force constants β and δ calculated from the elastic constants of the material of the respective BMGs for computing the dispersion curves. The computed phonon dispersion curves show appropriate behaviour for both the longitudinal and transverse modes. The transverse sound velocity and the longitudinal sound velocities with various dielectric screenings are calculated in the long wavelength region from the computed dispersion curves for both the BMGs. The first peak position of the static structure factor is predicted from the dispersion curves. The values of sound velocities and the first peak of the static structure factor estimated from the computed dispersion curves show excellent agreement with the experimental values reported in literature for the BMGs under consideration and the results may be used for correlating other properties of the BMGs.

KEYWORDS: Bulk metallic glass, dispersion curves, dielectric screening, elastic properties

The advent of bulk metallic glasses (BMGs) has attracted a lot of interest due to its novel properties and applications in diverse technological areas [1–3]. Pd-based BMGs due to their unique mechanical and thermal properties have shown potential applications as electrode, jewelry and medical materials [4–5]. However, the understanding of phonon dynamics and atomic structure configuration are essential for understanding their mechanical and thermal properties [6–9]. The phonon dynamics of metallic glasses have been studied experimentally [10–11] using neutron scattering. Theoretically computed phonon frequencies have been investigated by many researchers [12–17] for correlating them with mechanical and thermal properties in a variety of metallic glasses. Three main theoretical approaches, namely Hubbard and Beeby [15], Takeno and Goda [16] and that of Bhatia and Singh [8] are widely used for computing phonon frequencies of metallic glasses.

In this paper, the phonon dispersion curves of Pd₄₀Ni₁₀Cu₃₀P₂₀ and Pd₆₄Ni₁₆P₂₀ BMGs are computed using the simple model given by Bhatia and Singh [8]. This model assumes a central force which is effective between the nearest neighbours and a volume dependent force. Bhatia and Singh [8] determine the values of force constants δ and β using the value of longitudinal and transverse sound velocities along with the calculated value of force constant κ_e . However, in the approach adopted by us, we fix the values of force constants δ and β used in the computation of dispersion curves by using the value of bulk modulus (B) and shear modulus (G) of the respective BMGs along with the calculated value of κ_e . This method of determining the values of δ and β from the elastic moduli of the BMGs for computing phonon frequencies using the simple model is applied for the first time for the Pd₄₀Ni₁₀Cu₃₀P₂₀ and Pd₆₄Ni₁₆P₂₀ BMGs. The dielectric screening due to conduction electrons in the long wavelength region of the phonon frequencies is quite significant. To study its effect on the phonon frequencies, various dielectric screening functions [13] namely, Bhatia and Singh (BS), Hartree (H), Hubbard (HB), Geldart and Vosko (GV), self-consistent screening due to Shaw (SCS) and Overhauser (OH) are employed for the longitudinal mode.

The longitudinal sound velocities (V_L) are computed for different dielectric screenings and the transverse sound velocity (V_T) is computed from the longitudinal and transverse dispersion curves respectively in the long wavelength region for both the Pd₄₀Ni₁₀Cu₃₀P₂₀ and Pd₆₄Ni₁₆P₂₀ BMGs. The first peak position of the static structure factor $S(q)$ denoted by q_p provides key structural information and elastic properties of amorphous materials [7]. The value of q_p is estimated from the dispersion curves, where it occurs around the first minimum of the longitudinal vibration mode [9].

THEORY

The details of this theory of the simple model employed are given by Bhatia and Singh [8] and others [12–13]. The equations for the longitudinal phonon frequencies (ω_L) and transverse phonon frequencies (ω_T) as given by Bhatia and Singh [8] can be written as

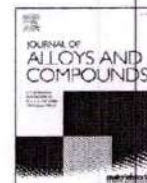
$$\omega_L^2 = \frac{2N}{\rho a^2} [\beta I_0 + \delta I_2] + \frac{\kappa_e K_F^2 q^2 [G(q; \epsilon)]^2}{\rho [q^2 + K_F^2 \epsilon(q)]}, \quad (1)$$

and



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Hydrometallurgical route for recovery and separation of samarium (III) and cobalt (II) from simulated waste solution using tri-n-octyl phosphine oxide – A novel pathway for synthesis of samarium and cobalt oxides nanoparticles

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ABSTRACT

Samarium is a precious and expensive rare earth metal due to its potential service applications as samarium cobalt magnets at elevated temperature up to 500 °C. The untrammelled demand of samarium and the supply risk of rare earth elements urge researchers to develop recycling processes. Distribution equilibrium of samarium (III) from nitrate medium with TOPO has been investigated taking into account variations in several extraction conditions. Extraction of samarium (III) was found quantitative (100%) using 0.05 M TOPO from 3 M NaNO₃ at aqueous pH 3. Based on slope analysis, the extracted species has been proposed as Sm (OH)₂ NO₃·3TOPO which was very well supported by FTIR spectral studies. The influence of cobalt (II) on the extraction of samarium (III) has also been studied and in most of the cases there were no extraction of cobalt (II). Temperature had negative impact on the extraction of samarium (III) even in the presence of cobalt (II). Stripping of samarium (III) from loaded 0.05 M TOPO was 100% using 0.02 M HCl. Pure Sm₂O₃ was successfully recovered from stripped solution of samarium (III) and Co₃O₄ was recovered from raffinate following oxalate precipitation and calcination. The formation of samarium and cobalt oxide nanoparticles was confirmed from X-ray diffraction, FESEM and EDS studies.

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1. Introduction

The meteoric growing exaction of REEs in diverse utilization for instance electronics, ceramic technology, electric vehicle batteries, magnetism, wind and solar energy conversion, catalysts in petroleum industries, phosphors, semiconductors, luminescence and laser materials is making them indispensable elements and is playing an important role in the transition toward low carbon, green economy [1,2]. These intensive demands of REEs have led the researchers to ascertain extraction and separation methods for obtaining high purity REEs. Excavation of REEs from primary resources and disposal of REEs based products to the environment have turned into environmental problems. To alleviate scarcity of REEs, the reprocessing of end-of-life products is required for

sustainable development. The end-of-life products from which REEs could be recycled are permanent magnets, NiMH batteries, lamp phosphors and FCC catalysts [3]. Permanent magnets based on rare earth and transition metals (RE-TM) e.g. Sm-Fe-N, Sm-Co and Nd-Fe-B are playing crucial role in modernization, particularly whenever there is matter of miniaturization and high efficiency. They have long range applications in electromechanical, electronic and magneto electronic devices, acoustics, motors in automobiles, storage devices, biomedical and many more [4–6]. Sm-Co magnets possess high curie temperature, high magnetic energy densities, resistant to corrosion and are thermally stable at elevated temperature [7]. Nd-Fe-B magnets show excellent magnetic properties at room temperature i.e. near about 200 °C but with increase in temperature their magnetic properties seem to drop down. On the other hand, Sm-Co magnets could show excellent magnetic property near about 500 °C due to which they are used in aero-engine applications [8]. But the manufacture of Sm-Co magnets is expensive and requires energy consuming

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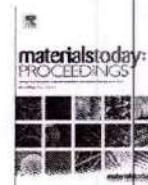
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Role of extractants and diluents in recovery of rare earths from waste materials

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ABSTRACT

It is perceived that our society is heading towards an ultra-connected world with the help of emerging technologies. The swift frequency of technological development has been possible due to enhanced advances in IT, cheapness of raw materials that lead to industrial development. Rare earth elements are playing a key role in the economic progress having diverse applications in alloys, magnets, catalyst, phosphors and are utilized in equipments such as batteries, sensors, electric vehicles. The prominence of these elements has gone up due to high demand, limited supply and non-availability of appropriate substitutes. Considering the present scenario, recovery of rare earths from end of life products through economical technology have become top priorities in metallurgy. There are diverse routes to recover rare earths from secondary resources ranging from hydrometallurgical to pyrometallurgical processes. Hydrometallurgical technique such as solvent extraction has been proved beneficial in recovering rare earths from these secondary resources. This review has been framed to discuss the role of extracting agents and diluents in the extraction circuits used for rare earth extraction and separation studies taking into consideration the end of life products. The function of different extractants such as di-(2-ethylhexyl) phosphoric acid (D2EHPA), 2-ethylhexyl phosphonic acid mono-2-ethylhexylester (PC 88A), bis(2,4,4-trimethylpentyl) phosphinic acid (Cyanex 272), trialkyl phosphine oxides (Cyanex 923) and diluents like pentane, hexane, Solvent 70, dodecane, Octanol and cyclohexanone employed for the extraction of rare earths from the waste materials, particularly magnet scraps, spent batteries and lamp phosphors have been highlighted. The recent challenges concerning the development of cost effective, eco-friendly green extractants like tricaprilmethyl ammonium chloride (Aliquat 336), DEHPA, Alamine 336 IL have also been discussed.

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1. Introduction

The on-going revolution of technology and industries emphasizes on the crusade towards low-carbon technology or green technology. In this transition, rare earth metals (REMs) play an essential role as major contributors in these emerging infrastructures and are recognized as the vitamins of modern technology [1]. These are a part of several devices starting from mobile phones to military appliances. Upgradation in technologies creates an increasing demand for REMs putting them at a stage of supply-risk. The limited supply and abruptly increasing demand of these

elements have led to the so called "balance problem" and hence, these are labeled as "critical" elements by European Union Commission [2]. Though the market share of REMs in economy of industries is unquestionable, the production of materials creates a lot of waste laying environment at risk which is of increased global concern. The anthropogenic inputs are the master sources of rare earth accumulation in soil, water, plant and air, which in turn enter into the food chain. The rare earth chain from mining to food is shown in Fig. 1 [3]. Based on this fact, it could be concluded that there is urgent need of sustainable recycling techniques with special attention to waste products containing substantial amount of rare earths.

The potential material streams of REMs are (1) pre-consumer products or scraps (2) post-consumer products or end-of-life products (EOLs) and (3) landfills rendered by pre-consumer and

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EFFECTIVENESS OF ICT INTEGRATED CONSTRUCTIVIST APPROACH ON ATTAINMENT OF CONCEPTS IN MATHEMATICS

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ABSTRACT

In the context of integration of information technology and communication in the Teaching / Learning of Mathematics, the present study examines the effectiveness of ICT integrated constructivist approach on the attainment of concepts in mathematics learning also it aims to ascertain the concept and gender independence of ICT integrated constructivist teaching model. The classroom samples in this study included 120 students of class VIII students. Students were divided into experimental group and control group, each having 60 students with the help of one to one matching based on their previous test marks. The true experimental design was used .To study the effectiveness data was collected with the help of self made exemplar materials using 5E constructivist teaching model integrated with ICT and concept based achievements.Pre-test and post-test were administered to compare the result. The results indicated that: Students of experimental group were significantly performed better than the students of control group .So ICT integrated has significant effect on the construction of concept in mathematics for class VIII student. It was concluded that there is no significant difference of concept 1 & concept 2 in experimental group . So ICT integrated has a significant effect on the construction of concepts in mathematics for class VII student.It was also concluded that there was no significant differences between the Mean gain score of Boys & Girls in experimental group . Hence it is concluded that ICT integrated constructivist approach is gender independence and concept independent.

Keywords: Information Communication Technologies, constructivist approach, 5E constructivist teaching model

Background of study

The value of mathematics in daily life cannot be questioned. Mathematics finds its application in the fields of science, technology, economics , business, commerce and computer design and functioning"Students need to construct their own understanding of each mathematical concept, so that the primary role of teaching is not to lecture, explain, or otherwise attempt to 'transfer' mathematical knowledge, but to create situations for students that will foster their making the necessary mental constructions.Information Communication

Technology, or ICT, is changing everything about the modern classroom. Chris Abbott states that "schools as institutions are changing rapidly as technology alters the schooling paradigm" (Abbott, 2000, p.48). Incorporating ICTs into the curriculum to enhance learning is also a standard of the 2008 Smart classroom Professional Development Framework.

ICT is so much more than something we have to teach. It is a way of teaching. Technology is such an integral part of



ETHNOBOTANICAL STUDY OF WILD EDIBLE FOOD PLANTS USED BY THE TRIBALS AND RURAL POPULATIONS OF ODISHA, INDIA FOR FOOD AND LIVELIHOOD SECURITY

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Abstract

The Wild Edible Food Plants (WEFPs) refer to those species which are neither cultivated nor domesticated but are important source of food in tribal areas of India. Uses of wild edible food as a coping mechanism in times of food shortage, provides an important safety net for the rural poor. In Odisha, there are 62 different tribes, of which the most numerous ones are Kondh, Gond, Santal, Saora, Kolha, Shabar, Munda, Paroja, Bathudi, Bhuiyan, Oraon, Gadabas, Mirdhas and Juang. The tribals of Odisha depend on forests for their food and other needs and regularly collect and consume fruits, leafy vegetables, tubers, flowers, mushrooms etc. from the nearby forests and have acquired vast knowledge about the wild edible food plants. The present study deals with the identification, documentation, ethnobotanical exploration and information on food value of wild edible plants (WEFPs) from different tribal dominated villages of Keonjhar, Mayurbhanj, Kalahandi, Bhitarkanika (Kendrapada), Rourkela (Sundargarh), Jeypore (Koraput), Rayagada, Ganjam, Gajapati, Nabarangapur, Phulbani district of Odisha. The ethnobotany and traditional uses of 193 wild edible plants have been dealt in this paper. Although the popularity of these wild forms of foods has declined, they are nutritionally rich and their usage need to be encouraged.

Key words : Odisha, Wild edible food Plants, Tribals, Traditional knowledge, Food security.

Introduction

Nutrition which is a fundamental biological process for self existence of living organisms. Food and nutritional security are key concerns the world over as low food intake and poor access to food in underdeveloped countries results in malnutrition and health hazards (Belcher *et al.*, 2005; Narendran *et al.*, 2001; Scherr *et al.*, 2004; Mahapatra & Panda, 2012). Food habits of human being have developed from the experience and through successive generations. Feeding in excess of 800 million undernourished people depend not only on increased productivity of domesticated crops but also the use of underutilized wild species. The wild plants and their products make significant contributions to the human and animal food web and are often a means of survival for millions of poor rural households. There is now greater recognition that products from the wild may support

household subsistence and income generation from their sale, either in raw or processed forms.

WEFPs are an important source of food in India and have a significant place in the dietary habits of small and marginal farmer's families and forest dwelling communities during the periods of food scarcity (Beluhan & Ranogajei, 2010). The food habits of tribals are generally developed according to the seasonal availability of food and their nutritional value and hence, food supply is traditionally based on their own collections.

India harbours 45,000 plant species and 550 tribal communities. The tribals belong to 227 linguistic groups and they inhabit varied geographic and climatic zones with diversified plant species, varied culture, rich traditional knowledge and wisdom. From the ethnobotanical studies of wild plants indicate that more than 7000 species have been used for human food at some stage in human history (Grivetti & Ogle,

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Research Article

Antibacterial activity assessment of petroleum ether and methanolic extracts of *Achyranthes aspera* Linn (Amaranthaceae)

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Abstract

Achyranthes aspera is a common weed and known for various medicinal properties. The aim of the present study was to evaluate the antibacterial activities of different concentrations of methanolic and petroleum-ether leaf extracts of *A. aspera* against three gram-positive bacteria (*Micrococcus luteus*, *Bacillus subtilis*, *Streptococcus mitis*) and six gram-negative bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Salmonella typhi*, *Salmonella paratyphi A* (MTCC-3220), *Shigella flexneri*). The phytochemical screening of the leaf extract of the herb indicated the presence of flavonoids, tannins, saponins, polyphenolic compounds, alkaloids and glycosides. The methanolic extract at the highest concentration of 10 mg/ml showed prominent antibacterial activity in two gram-negative bacteria, i.e. *K. pneumoniae* and *E. coli* with 22 mm zone of inhibition and one gram-positive bacterium i.e. *M. luteus* with 19 mm zone of inhibition. The methanolic extract at 0.0781 mg/ml concentration showed least antibacterial activity against all tested bacteria produced a zone of inhibition between 10 to 12 mm while petroleum ether extract of same concentration had moderate antibacterial activity against *S. flexneri* (15 mm zone of inhibition). It can be concluded that novel compounds like flavonoids, tannins, saponins, alkaloid, and polyphenolic compounds in *A. aspera* leaves have potent antimicrobial property.

Keywords: *Achyranthes aspera*, Antibacterial activity, Gram-negative, Gram-positive, Phytochemical

INTRODUCTION

The leading cause of World-wide deaths is due to infectious diseases. Though pharmaceutical industries have produced a wide range of antibiotics, resistance to these drugs by bacteria has increased as they have the genetic ability to acquire resistance. These drug-resistant bacteria are more pathogenic with high mortality rate and become a great challenge in the pharmaceutical and healthcare industry (Westh et al., 2004). To overcome these antibiotic-resistant bacteria, researchers are looking for alternative and novel

drugs. According to the World Health Organization (WHO), medicinal plants would be the best natural source to obtain a variety of compounds for the treatment of various infectious diseases (Vijayan et al., 2007). About 80% of the world's population relies on traditional medicines which has compounds derived from medicinal plants. In comparison to synthetic antibiotics, plant based drugs cause less or no side effects (Burt, 2004; Shariff et al., 2006; Dubey et al., 2011). Phytotherapy, the treatment of disease by the use of plants is a very old practice when a primitive man out of necessity and by intuition began to use plants to

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होना आवश्यक नहीं है तथा चित्रों का
प्रतीकात्मक प्रयोग किया गया है।

भारत में ई-शिक्षा : सरोकार और सीमाएँ

□ डॉ. रेखा यादव

ई-शिक्षा एक आपद
धर्म है या सहज धर्म इस पर
विचार की आवश्यकता है।
भारतीय परंपरा में शिक्षा को
संस्कार माना जाता है जो मनुष्य के
जैविक रूप का रूपांतरण करने में
सहायक होती है। शिक्षा के द्वारा
मनुष्य को सामाजिक संस्कार दिए
जाते हैं। अपने आरंभिक रूप में
भारतीय शिक्षा मौखिक
ही रही है।

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Disaster Management and Education

□ Dr. Shekhar Chandratre

India, being a developing country, is already facing the challenges of resource-crunch. In such a situation, if disaster strikes, our hard-earned gains of development are lost and economy receives a serious setback.



For example, the present pandemic has already taken a toll of more than 3.5 lakh deaths globally. The advanced countries have suffered the most.

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शैक्षिक मंथन (मासिक) 1 जून 2020

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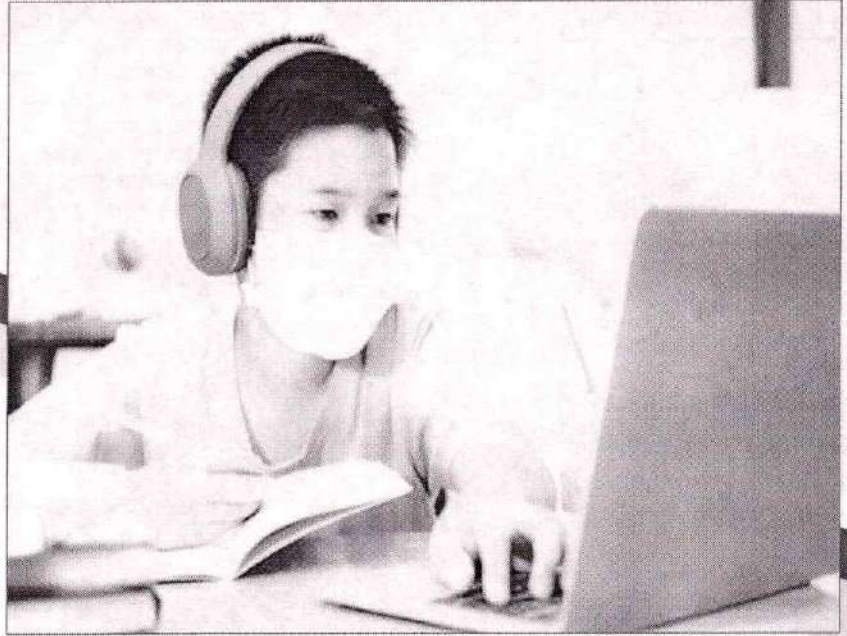
ई-शिक्षा व्यवस्था में परीक्षाओं को निरापद ढंग से आयोजित किया जा सकता है और इनका मूल्यांकन बहुत ही अल्प समय में संभव है। एक ही साथ, लाखों-करोड़ों या अरबों लोगों की परीक्षा विश्व के किसी भी कोने से बैठकर आयोजित की जा सकती है। और परिणामों की उद्घोषणा और वितरण भी आसानी से किया जा सकता है।



प्रो. पी.सी. अग्रवाल

प्राचार्य,
क्षेत्रीय शिक्षा संस्थान,
भुवनेश्वर (ओडिशा)

ई-शिक्षा और भविष्य



संगणक (कम्प्यूटर) और अन्य डिजिटल युक्तियों के बढ़ते उपयोग के दौरान ई-शिक्षा के इतर शिक्षा व्यवस्था की कल्पना असंभव ही है। ई-शिक्षा या इलेक्ट्रॉनिक-शिक्षा अर्थात् शिक्षा के आदान-प्रदान में इलेक्ट्रॉनिक माध्यम का उपयोग। प्रारम्भ में यह हिन्दी-अंग्रेजी लिपि लेखन और गणना कार्य से आरम्भ हुयी और आज प्रत्येक विषय हेतु आवश्यक सहभागी हो गयी है।

वर्तमान, भारत सरकार ने स्वयं, स्वयंप्रभा, नेशनल डिजिटल लाईब्रेरी, ई-यन्त्र, फसोस, वर्चुअल लैब, ई-ज्ञानकोश, ज्ञान दर्शन, ज्ञानवाणी, दीक्षा, ई-पाठशाला, इ.पी.जी. पाठशाला, ई-शोध सिन्धु, शोध-गंगा, शोध-शुद्धि, विद्वान, नेट, यूजीसी, मूक्स, साक्षात् आदि ई-कार्यक्रमों के माध्यमों से भारतीय छात्रों को ई-शिक्षा से जोड़ने और प्रशिक्षित करने का अभिनव सुअवसर उपलब्ध कराया है। यह कार्यक्रम भारतीय छात्रों के विभिन्न आयु वर्गों और रुचियों की आवश्यकताओं के अनुरूप बनाये गये हैं और निःशुल्क रूप से अन्तरजाल

(इन्टरनेट) के माध्यम से उपलब्ध हैं। इन सभी में, भारत के सर्वश्रेष्ठ ई-मनीषियों द्वारा ई-सामग्री की सर्वश्रेष्ठ पाठ्यवस्तु को विकसित किया गया है व किया जा रहा है।

ई-शिक्षा की चुनौतियाँ : लाभ-दोष सीमित अन्तरजाल (इन्टरनेट) संकेत-

भारत की 40 प्रतिशत जनता को आज भी, अन्तरजाल संकेतों की पूर्ण उपलब्धता प्राप्त नहीं है। उसके कारणों में भौगोलिक स्थिति, अपर्याप्त विकास, संसाधनों का सीमित होना आदि प्रमुख हैं। इसलिए ई-शिक्षा को समान रूप से समान-वितरण प्रणाली में शामिल करना अभी भी दूर की कौड़ी है। किन्तु वर्तमान सरकार ने इस चुनौती को दूर करने का निरन्तर प्रयास किया है और सुदूर स्थानों में इसको पहुँचाने का कार्य किया है। आशा है कि निकट भविष्य में इसमें आशातीत प्रगति होगी।

प्रामाणिक विश्वसनीय ज्ञान

ई-शिक्षा में अभ्यर्थियों को अन्यान्य असीमित वैश्विक पाठ्य सामग्री की उपलब्धता है, पर इस सभी पाठ्य

सामग्री में विश्वसनीयता निश्चित नहीं है और प्रामाणिक नहीं है। 'आमिर कसाब' को बहुत से ई-वेबज दुर्दान्त आतंकवादी सिद्ध करते हैं, पर ऐसे भी ई-वेबज की कमी नहीं है, जो उसको स्वतंत्रता संग्राम सेनानी की तरह प्रस्तुत करते हैं और यही शिक्षक का वास्तविक कार्य है कि वह अपने छात्रों को प्रामाणिक और विश्वसनीय ई-पाठ्य स्रोतों को पहचानने और चयनित करने में सहायता प्रदान करे। सभी तक समान और सहज उपलब्धता

ई-शिक्षा व्यवस्था का यह प्रमुख लाभ है कि इस तक, सभी की समान पहुँच है। चाहे व्यक्ति किसी भी प्रकार की व्यक्तिगत विभिन्नता, आर्थिक विभिन्नता, बुद्धि विभिन्नता धारित करता हो और ई-शिक्षा की प्राप्ति का तरीका बहुत ही सरल भी है। किन्तु यह इसकी एक बुराई भी हो सकती है क्योंकि इस ई-शिक्षा व्यवस्था को बहुत ही सरलता से बुरे व्यक्तियों द्वारा अपने नियंत्रण (हैक) में भी लिया जा सकता है और अन्यान्य तरीके से हानि पहुँचायी जा सकती है। किन्तु इस दोष को एक बेहतर सुरक्षा प्रणाली विकसित करके

शैक्षिक मंथन

(द्विभाषी मासिक)

शैक्षिक क्षेत्र की प्रतिनिधि पत्रिका

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सामाजिक-राजनीतिक आंदोलनों और परिवर्तन की प्रक्रिया युवाओं को जल्दी आकर्षित करती है। वे नये के प्रति अधिक आसक्त व सचेष्ट रहते हैं इसलिए युवा स्वाभिमानी, ओजस्वी, बलिदानी होने के साथ भावुक और अतिसंवेदनशील भी होते हैं।



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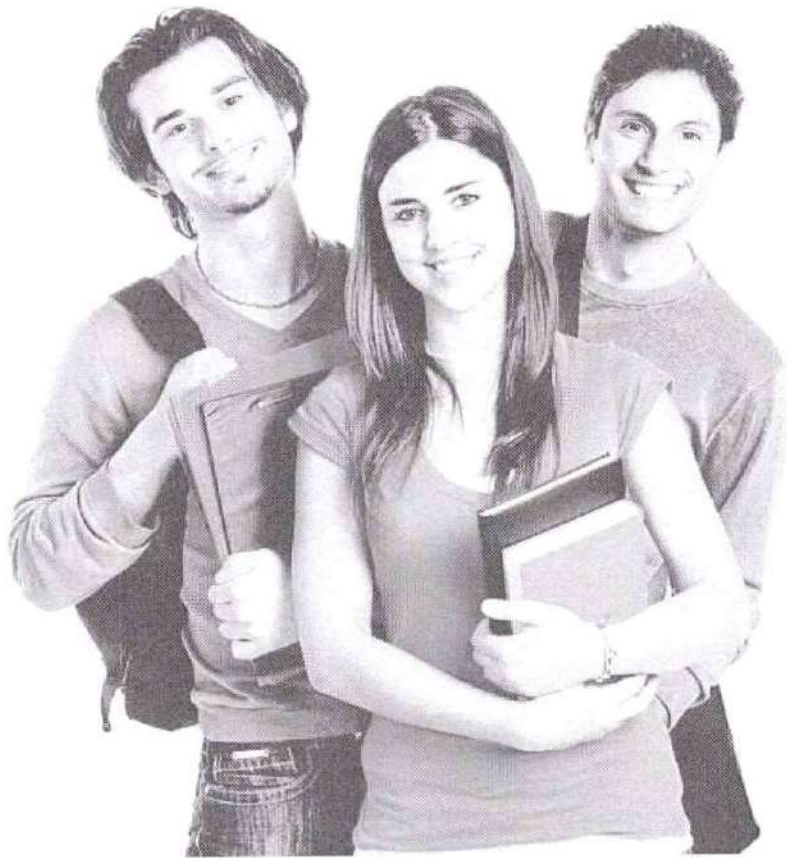
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भुवनेश्वर



युवा शब्द जीवंतता, आनन्द, उत्साह और कुछ नया करने के जुनून के साथ जुड़ा हुआ है। भारत को भी युवा नाम से अलंकृत किया जा रहा है। क्योंकि भारत राष्ट्र की अभी सबसे ज्यादा जनसंख्या युवा वर्ग की है। प्रत्येक देश का भविष्य निश्चित रूप से यहाँ की युवा पीढ़ी पर आधारित होता है। महादेवी वर्मा ने कहा है 'बलवान राष्ट्र वही होता है, जिसकी तरुणाई सबल होती है, जिसमें भविष्य के सपने होते हैं और कुछ कर गुजरने का जज्बा होता है, वही तरुणाई है। अर्थात् यह सत्य है कि किसी भी राष्ट्र और समाज की सारी ऊर्जा उसकी युवा शक्ति में निहित होती है। जो राष्ट्र अपनी युवा शक्ति का बेहतर और नैतिक इस्तेमाल करता है, वह आगे बढ़ता है और जो ऐसा नहीं कर पाता, वह अपने तमाम साधनों/संसाधनों के बावजूद उस दौड़ में पीछे रह जाता है जिसे हम निर्माण और विकास की दौड़ कह सकते हैं।

वर्तमान संसार एक परिदृश्य में प्रतिस्पर्धा से लबालब भरा हुआ है, जिससे शिक्षा का मतलब युवाओं के लिए बदल गया है। आज के इस दौर में युवाओं के लिए शिक्षा का संबंध एक अच्छे सरकारी पद पर आसीन होकर अधिक से अधिक धन उपार्जन करने से है। नैतिक मूल्यों का पतन हुआ है जिससे समाज में अराजकता का प्रसार हुआ है। आधुनिक युग में

अभिभावक अपने बच्चों से सदैव प्रथम आने को कहते हैं, हमेशा शीर्ष स्थान प्राप्त करना ही सफलता का बोधक बन गया है। परन्तु क्या ऐसा संभव है कि दौड़ में भाग लेने वाला हर व्यक्ति प्रथम स्थान प्राप्त कर सके। ऐसे में आवश्यकता है उचित मार्गदर्शन की जो कि समुचित शिक्षा से ही संभव है।

युवाओं के लिए बहुराष्ट्रीय कंपनियों में नौकरी प्राप्त करना ही सर्वाधिक महत्वपूर्ण कार्य है। इस प्रक्रिया में युवा किताबी ज्ञान अर्जित कर अकादमिक क्षेत्र में बेहतर प्रदर्शन करता है एवं सफलता भी प्राप्त करता है, परन्तु इस प्रक्रिया में वह कहीं न कहीं नैतिक मूल्यों को उचित रूप से धारण नहीं कर पाता। प्रतिस्पर्धा पूर्ण वातावरण में युवा इतना विलीन हो जाता है

युवा और शिक्षा

कि प्रेम और सौहार्द बनाने के बजाय वह केवल अग्रसर होने का सोचता है, ऐसे में नैतिक मूल्यों का हनन भी स्वीकार्य होता है। युवा देश के प्रतिष्ठित संस्थान संघ लोक सेवा आयोग द्वारा आयोजित सिविल सेवा की परीक्षा उत्तीर्ण कर भारतीय प्रशासनिक सेवा में अपना योगदान देकर देश सेवा को सर्वोपरि रखने की उद्घोषणा करने के बावजूद अनेक अधिकारी कुछ समय पश्चात् ही समाज में व्याप्त भ्रष्टाचार व अनैतिक कार्यों में लिप्त पाए जाते हैं। ऐसे में राष्ट्र निर्माण करने के लिए तथा देश में अराजकता के माहौल को समाप्त करने के लिए सही शिक्षा ही एक मात्र मार्गदर्शक बनती है।

इसमें कोई संदेह नहीं कि भारत के युवा प्रतिभाशाली हैं, और जो देश को

शैक्षिक मंथन

(द्विभाषी मासिक)

शैक्षिक क्षेत्र की प्रतिनिधि पत्रिका

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(आषाढ़-श्रावण, विक्रम संवत् 2077)

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के.नरहरि

डॉ. विमल प्रसाद अग्रवाल
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सम्पादक
डॉ. राजेन्द्र शर्मा

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प्रतीकात्मक प्रयोग किया गया है।

भारतीय भाषाएँ और संस्कृत, विशिष्ट एकसूत्रता

□ महामहोपाध्याय देवर्षि कलानाथ शास्त्री

संस्कृत की शब्दावली भारत की समस्त भाषाओं में बहुत बड़े रूप में व्याप्त है यह हम सब कहते रहते हैं। इसे यों भी कहा जा सकता है कि जब संस्कृत का उद्भव हुआ था उसने समस्त देश की भाषाओं की शब्दावली को आत्मसात् कर अपना शब्द भण्डार विपुल और विराट बना लिया था। वैदिक काल में जो छान्दस भाषा थी उसके शब्द भी संस्कृत में हैं, उस समय जो लोक भाषाएँ प्रचलित थीं, और जिन्हें पाणिनि ने भाषा शब्द से या विभाषा शब्द से व्यवहृत किया है उन सबसे शब्दों को लेकर पाणिनि ने उनका संस्कार किया, संस्कृत व्याकरण लिखा और साधुत्व अनुशासित किया। आज हमें चाहे उन शब्दों का मूल ज्ञात न हो किन्तु वे विश्व की सारी भाषाओं से आकर संस्कृत में उसी समय मिल गये थे।



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अनुक्रम

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- हनुमान सिंह राठौड़
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Samskruthi And Education

□ R. Seethalakshmi

Mahatma Gandhi. "Man is neither mere intellect, nor the gross animal body, nor the heart or soul alone. A proper and harmonious combination of all the three is required for making of the whole man and constitutes the true Education".



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कोराना काल में लगे लॉकडाउन के समय शैक्षिक मंथन के माह अप्रैल 2020 अंक -9, मई 2020 अंक-10 एवं जून 2020 अंक-11 को शैक्षिक मंथन की वेबसाइट shaikshikmanthan.com पर ऑनलाइन प्रकाशित किये जा चुके हैं। - प्रबन्ध सम्पादक

शैक्षिक मंथन (मासिक) 1 जुलाई 2020

3

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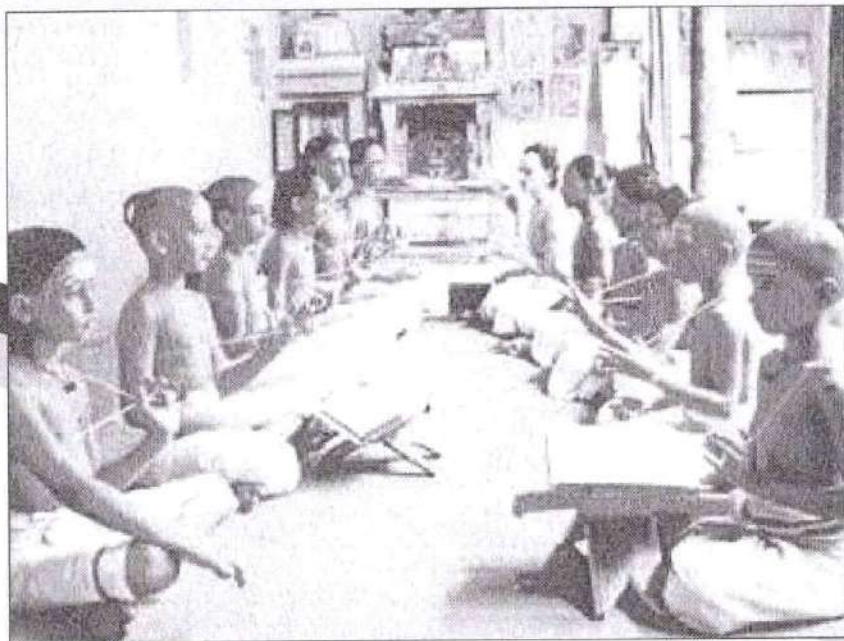
वास्तव में प्राकृतिक शक्तियों को छोड़ जितनी मानव परिस्थितियाँ हमको प्रभावित करती हैं उन सभी की संपूर्णता को संस्कृति कहते हैं। यह घेरा सांस्कृतिक पर्यावरण कहलाता है जिसमें जीवन के प्रतिमानों, व्यवहारों, विचारों, सामाजिक मूल्यों, मानवीय क्रियाओं और घटनाओं को इसमें समाहित करते हैं।



प्रो. पी.सी. अग्रवाल

प्राचार्य,
क्षेत्रीय शिक्षा संस्थान,
भुवनेश्वर (ओडिशा)

संस्कृति, संस्कृत और शिक्षा



संस्कृति किसी समाज में पाई जाने वाली उच्चतम मानवीय मूल्यों की सहज चेतना है। सामाजिक प्रथाओं, व्यक्तियों की चित्तवृत्तियों, मनोभावों, मनोवृत्तियों तथा आचरण के साथ-साथ भौतिक पदार्थों के विशिष्ट स्वरूप दिए जाने में इनकी अभिव्यक्ति होती है। यों तो संस्कृति शब्द की व्युत्पत्ति सम (उपसर्ग) सुटा कृ (धातु) क्तिन (प्रत्यय) से बताई गई है जिसका अर्थ है-सँवारना, निखारना, परिष्कार। इस प्रकार स्वर्ण को तपा कर उसके मल का क्षारण करना, उसमें सुहागा आदि मिलाकर उसकी चमक को बढ़ाना भी संस्कार है। अतः किसी वस्तु में निहित गुणों का विकास करना या किसी नवीन विशेषता का आधान करना ही संस्कार या संस्कृति है। अंग्रेजी भाषा में इसके लिए मल्ल शब्द का प्रयोग किया जाता है। इसकी व्युत्पत्ति लैटिन भाषा के कल्दुरा से मानी गई है और क्रिया रूप में वह फ्रेंच क्रिया कल्दुतेर से निष्पन्न माना गया है। जिसका कोषगत अर्थ है - जोतना, किसी वस्तु को विकसित करना या परिष्कृत करना है। संस्कृति शब्द का अर्थ अत्यंत

व्यापक है। मानव की आंतरिक और बाह्य स्थितियों के सुसंस्कृत एवं परिष्कृत समूह को संस्कृति कहा जाता है। संस्कृति हमारे जीवन में उसी प्रकार व्याप्त है जिस प्रकार फूल के अंदर सुगंध या दूध के अंदर मक्खन। संस्कृति का स्वरूप भी उसी तरह का है। इसे परिभाषित करना कठिन है। फिर भी कुछ महापुरुषों की संस्कृति विषयक परिभाषाएँ निम्नवत हैं -

प्रो. हुमायुं कबीर ने लिखा है, 'संस्कृति एक विचार है जिसकी साधारण या असाधारण रूप में परिभाषा नहीं हो सकती। संस्कृति का कोई निश्चित स्वभाव या चिह्न नहीं है जिसे संस्कृति का तत्त्व या विशेष्य माना जाए। यह सदैव बहुत महत्वपूर्ण धाराओं और शक्तियों का सम्मिश्रण है।'

बोगार्डस के अनुसार- 'किसी समूह के कार्य करने और विचार करने के सभी तरीकों का नाम संस्कृति है।' एक विद्वान महापुरुष के अनुसार- 'संस्कृति का अर्थ मनुष्य का भीतरी विकास तथा उसकी नैतिक उन्नति है। एक-दूसरे के सद्व्यवहार है और दूसरे को समझने की

शक्ति है।' राजगोपालाचारी- 'किसी भी जाति अथवा राष्ट्र के शिष्ट पुरुषों में विचार, वाणी एवं क्रिया का जो रूप व्याप्त रहता है उसी का नाम संस्कृति है।'

मैलिनोस्की - संस्कृति मनुष्य की कृति है तथा एक साधन है, जिसके द्वारा वह अपने लक्ष्यों की प्राप्ति करता है।

इस प्रकार से संस्कृति एक आवरण है जो हमें चारों ओर से घेरे रहता है। वास्तव में प्राकृतिक शक्तियों को छोड़ जितनी मानव परिस्थितियाँ हमको प्रभावित करती हैं उन सभी की संपूर्णता को संस्कृति कहते हैं। यह घेरा सांस्कृतिक पर्यावरण कहलाता है जिसमें जीवन के प्रतिमानों, व्यवहारों, विचारों, सामाजिक मूल्यों, मानवीय क्रियाओं और घटनाओं को इसमें समाहित करते हैं। इस प्रकार मानव के धार्मिक, दार्शनिक, कलात्मक, नीतिगत जैसे अमूर्त तथा सुविधा जनक बाह्य कार्यकलाप जैसे आहार, विज्ञान, रहन-सहन, जैसे स्थूल या मूर्त विषय आदि शामिल हैं। इस प्रकार जीवन के समस्त कार्यकलापों के समन्वयन को संस्कृति कहते हैं। जर्मनी के विद्वान स्पेगलर ने

शैक्षिक मंथन

(द्विमासी मासिक)

शैक्षिक क्षेत्र की प्रतिनिधि पत्रिका

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मार्गशीर्ष, विक्रम संवत् 2077

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शैक्षिक मंथन मासिक में प्रकाशित
सामग्री से संपादक मण्डल का सहमत
होना आवश्यक नहीं है तथा चित्रों का
प्रतीकात्मक प्रयोग किया गया है।

स्वदेशी से बनाएँ समृद्ध व समर्थ भारत

□ प्रो. भगवती प्रकाश शर्मा

स्वदेशी, अर्थात् भारतीय उत्पाद या मेड बाई भारत उत्पाद, सेवाएँ व ब्राण्ड ही खरीदना। विदेशी आयातित व विदेशी कम्पनियों के मेड इन इण्डिया उत्पादों को छोड़ देना। चीन में आयातित व चीन के मेड



इन इण्डिया ब्राण्ड उत्पाद कतई नहीं खरीदना। चीन मेक इन इण्डिया करने हेतु जो विदेशी निवेश ला रहा है उसे पैर जमाने का अवसर नहीं देना।

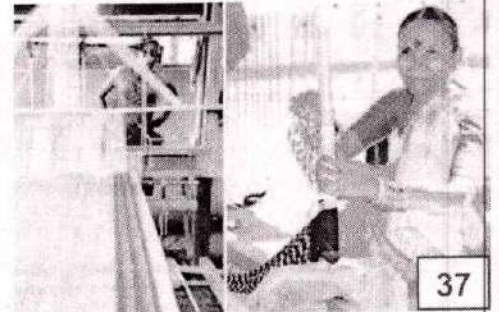
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Swadeshi and Swabhimana

□ Dr. T.S. Girishkumar

Swabhimana is not spurious pride. There is a difference between ego – spurious pride – and pride per say itself. Ego is blatant lie to oneself in most cases. One thinks that one is something, and so is somehow great. Spurious pride arises from the belief that one is being rightful, albeit without really knowing anything. The belief of some Islamists that one can go to heaven if and only if one accepts their given God in the given pattern is an example here. Swabhimana on the other hand is self-respect built upon acquired qualities and values.



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स्वदेशी से ही आत्मनिर्भरता



प्रो. प्रकाश चंद्र अग्रवाल

प्राचार्य,
क्षेत्रीय शिक्षा संस्थान,
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स्वदेशी दो शब्दों से मिलकर बना है स्व जिसका अर्थ है स्वयं का/निज का। तथा देशी का अर्थ है देशज अर्थात् देश में बनने या निर्मित होने या जन्म लेने वाला/वाली। इस प्रकार से स्वदेशी का अर्थ हुआ कि किसी निश्चित भूभाग में निर्मित, कल्पित, कोई नीति, विचार, सिद्धांत या किसी वस्तु को स्वदेशी की संज्ञा दी जा सकती है। इस प्रकार से जिन वस्तुओं का निर्माण निज या स्वयं के देश में होता है उनको हम स्वदेशी कहते हैं।

हमें स्वदेश तथा स्वदेशी चीजों से प्यार होना चाहिए। जहाँ हम जन्म लेते हैं, प्रकृति की संपदा के बीच पलते बढ़ते हैं, वह हमारी जन्मभूमि, कर्मभूमि है और उसे ही हम अपना देश अर्थात् स्वदेश मानकर उससे प्रेम का गहरा संबंध जोड़ लेते हैं। यह प्रेम स्वतः उपजता है, उसके लिए किसी शिक्षण-अभ्यास की जरूरत नहीं होती है। देश आज की धारणा में राष्ट्र की एक इकाई के रूप में सामने आता है। राष्ट्र में देश

अर्थात् भूमि-प्रदेश के साथ वहाँ का जन-समुदाय और उनकी संस्कृति का योग भी रहता है। स्वदेश-प्रेम इसी राष्ट्र-प्रेम का रूप है जिससे उसके प्रति गहरा अनुराग और गौरव का भाव सदा विद्यमान रहता है। देश-प्रेम का तकाजा है कि हम सदा उसके गौरव की रक्षा करें और उसके विकास में यथाशक्ति योगदान दें। जो मनुष्य-जन्म लेकर भी अपने देश से प्यार नहीं करता, उसका तो जीना भी व्यर्थ है, यथा-

**जिसको न निज गौरव तथा
देश का अभिमान है।
वह नर नहीं, पशु है निरा,
और मृतक समान है।**

किसी देश का आत्मनिर्भर होना उसके स्वदेशीपन को दिखाता है। जो देश जितना अधिक आत्मनिर्भर है वह उतना अधिक विकसित होगा, इसलिए आज के दौर में आत्मनिर्भर होना देश की परिपक्वता तथा मजबूती का पर्याय है। आज के वैश्विक परिवेश में जहाँ उदारीकरण, निजीकरण, वैश्वीकरण की वजह से दुनिया की अधिकाधिक कंपनियाँ अपने उत्पादों को बेचने के लिए भारतवर्ष को अधिक जनसंख्या की वजह से दुनिया का सबसे बड़ा बाजार मानती हैं। इस कारण से प्रतिस्पर्धा के दौर में हमारे कल-कारखाने,

कुटीर उद्योग, कृषि उत्पाद तथा लघु-उद्योग आदि को वैश्विक चुनौतियों का सामना करना पड़ रहा है। यदि हम मिलकर अपने स्वदेश प्रेम तथा स्वदेशी उत्पादों के प्रति अपनी धारणा नहीं बदलेंगे और आत्मनिर्भर नहीं बनेंगे तो आज के दौर में हम तथा हमारा देश न सिर्फ इस प्रतिस्पर्धा में बहुत पीछे रह जाएगा बल्कि बहुत सारा हमारा धन भी विदेशों में जाएगा परिणामतः हमको एक बार फिर से बेरोजगारी, भुखमरी, पिछड़ेपन की त्रासदी के दौर से गुजरना पड़ेगा। अतः स्वदेशी जागरण अभियान आज के समय की मूलभूत आवश्यकता है।

स्वतंत्रता संग्राम के दौरान बंग-भंग विभाजन के समय से जनजागरण के द्वारा स्वदेशी आंदोलन को बहुत बल मिला। परंतु स्वदेशी का इतिहास इससे भी पुराना है। यद्यपि भारत में स्वदेशी का पहले-पहल नारा बंकिमचंद्र चटोपाध्याय 'बंगदर्शन' में विज्ञानसभा का प्रस्ताव रखते हुए दिया था। उन्होंने कहा था- 'जो विज्ञान स्वदेशी होने पर हमारा दास होता है, वह विदेशी होने के कारण हमारा प्रभु बन जाता है।' जुलाई सन् 1903 में 'सरस्वती' पत्रिका में 'स्वदेशी वस्त्र का स्वीकार' नामक शीर्षक से एक कविता छपी। जिसकी वजह से स्वदेशी जागरण को और बल मिला इस



INDUCED-ANTIFUNGAL ACTIVITY IN *ORYZA SATIVA* L. CAUSED BY *PYRICULARIA ORYZAE* CAV. WITH A LOW DOSE OF NICKEL PRIMING

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Abstract

Hydroponically grown rice seedlings were treated with a micronutrient Ni (II) and blast inducing fungus *Pyricularia oryzae* Cav. (MTCC 1477) under controlled condition to investigate the effect of Ni (II) on *Pyricularia oryzae* Cav. (MTCC 1477) in *Oryza sativa* L. (var. Naveen). Ten days old seedlings were treated with different Ni (II) (as NiCl₂) concentrations (40 µM) and after 3 days, spores of *P. oryzae* were sprayed on these treated seedlings each of 2 mL (contains 10⁵ CFU/mL). The morphological, biochemical and chlorophyll fluorescence parameters were studied in 10, 20 and 30d treated seedlings to evaluate the effect of Ni (II) on fungus in different gradations and effect of co-stress on *Oryza sativa* L. There was a significant decrease in growth and physio-chemical parameters in both the fungus (F) and Ni (II) treated rice seedlings when grown separately, whereas in co-stress of fungus with Ni (II) (40 µM) treated seedlings these parameters were restored. It indicates that Ni (II) inhibits the activity of fungal toxins in the rice seedlings. The JIP-test parameters and the anti-oxidative enzyme activity showed a growth-enhancing effect for 40 µM Ni (II) diseased rice plants. Under present experimental conditions, the study suggests that 40 µM Ni (II) concentration act as a nutritive supplement as well as induces antifungal activity against *P. oryzae* Cav. causing rice blast disease in *O. Sativa* L.

Key words : Antioxidative enzymes, Chlorophyll fluorescence parameters, Nickel (II), *Oryza sativa*, *Pyricularia oryzae*.

Introduction

Plants have developed different mechanisms for their survival sensing the external stress environment, get stimulated, and then create cellular responses accordingly to cope and combat abiotic or biotic stress. The signalling pathways have a vital role in sensing the environment stress and accordingly produce a distinct physiological and biochemical response (Zhu 2002). Plants under heavy metal stress are more prone to diseases by herbivores and/or microbial infections. Sometimes negative, positive or neutral effect between metal and pathogenic infection may experience by many plants (Hanson *et al.*, 2003; Jhee *et al.*, 2005). Heavy metal stress might save energy-demanding organic fortifications (Boyd and Martens 1998). But some heavy metals may induce resistance against biotic stress in plants. Metal ions may initiate biochemical reactions and rarely fight against pathogenic disease in non-hyper-accumulator plants (Walters *et al.*,

2005). But, metal-induced ROS that can set off protection signals and as a result fabricates secondary metabolites (Jiang *et al.*, 2005).

Blast is one of the dominant airborne or seed-borne infections in rice across the globe. The pathogen *Pyricularia oryzae* Cav. usually causes leaf blast or neck blast (Bonman 1992). It was a reported fact that the productivity of rice significantly drops due to blast disease in 75% of the cases. Higher tolerance to excess metal of the plant than of the pathogen can lead to hermetic response where growth stimulation can be observed due to the efficient repression of the pathogen (Calabrese *et al.*, 2007).

Nickel being a micronutrient required by many plant in traces whereas in excess it induces heavy metal stress response. The present study aims to induce an optimal dose of Ni-stress which may trigger many genes encoding certain metabolites responsible to detoxify the fungal toxins by *P. oryzae* in rice seedlings. In metal

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Implementation of Government Public Policy for Inclusive and Equitable Quality Education Towards Sustainable Development

Mr. Amlesh Kumar & Prof. Laxmidhar Behera

ABSTRACT

Education is the single greatest tool for achieving social justice and equity. Equity in education is a measure of achievement, fairness and opportunity in education. Equity means giving each student access to the resources they need to learn and thrive. Government public policy is implemented through the activities of public bureaucracies and the expenditure of public funds. In policy formulation various agencies are involved directly or indirectly. Public policy is a government action or proposed action directed at achieving certain desired goals or objectives. Implementation actually refers to the process and activities involved in the application, effectuation and administration of a policy. It is the process of turning policy into practice. However, it is common to observe a gap between what was planned and what actually occurred as a result of policy. No policy can succeed if the implementation does not bear any relationship to the intentions of policy. Equity in education is critical for promoting sustainable development and improving the capacity of the people to address developmental issues. The government has primary responsibility to follow-up and review regularly the public policy for inclusive and equitable quality education towards sustainable development. This study examines the emerging problems of implementing government public policy for inclusive and equitable quality education: Towards sustainable development.

Keywords: *Inclusive and equitable quality education, Sustainable Development, Government Public Policy.*

Introduction

The Universal Declaration of Human Rights in Article 26 (1) and (2) adopted on 10th December 1948 by the General Assembly of the United Nations (UN) mandates that everyone has the right to education and that education shall be directed at the full development of the human personality leading to the strengthening of respect for human rights and fundamental freedoms. Education is an essential tool for achieving sustainability. Over six decades

Research Scholar, RIE (NCERT), Bhubaneswar, Prof. Laxmidhar Behera RIE (NCERT), Bhubaneswar



Kinematic Analysis of Support Phase Characteristics in Women Race Walking

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Abstract: Race walking requires a great deal of effort to compete successfully which includes a unique combination of technique, extreme physical exertion and mental focus. Unlike running, race walking is composed by support phase (heel strike, mid-stance and toe off) and swing phase. The aim of this study was to analyze the association between different kinematic characteristics of support phase during race walking and walking velocity. The rules of race walking demand that no visible flight time should occur and the stance leg must be straightened from initial contact to midstance. Previous research has not examined whether these rules also have an effect on walking performance and what consequences might arise. Top ten (U-20 Girls) finishers of 10000m race walk discipline, 33rd National Junior Athletic Championships, 2017 held at Acharya Nagarjuna University, Vijaywada, A. P. India were recorded by using two Nikon digital 4K camcorders (60 Hz) mounted on rigid tripods were placed alongside of the course at approximately 90° to the plane of motion. The junior athletes were analyzed by using motion analysis software (KINOVEA 0.8.27). Descriptive statistics and Pearson Product Moment Correlation coefficient ($p < 0.05$) were employed for statistical calculation. The tabulation of data was done by using the IBM SPSS 25 software. The result of the study revealed that, women athlete's performance were affected by the long contact phase duration (Mean = 0.33 s (\pm) 0.05). This factor relatively creates hindrances in propulsive phase. A negative association ($r = -0.49$) found between contact time and average speed. As expected, due to the technical rules of this discipline knee angle at heel contact is significantly correlated with velocity as the calculated r value was 0.709* (Critical value at 8 df $r = 0.632$). Whereas, at mid stance phase a negative correlation found between knee angle and walking performance that sketch a hyper extended knee. However, a positive linear relationship found in variables like, hip angle, elbow angle at heel contact and mid stance phase with walking velocity. But, a less economical technique observed in toe off phase for almost every variable as those were negatively associated with mean speed, and so a balance between those fundamental techniques of support phase variables is advisable. The race walkers had shorter swing times, longer contact times, and smaller maximum knee flexion angles ($152^\circ \pm 7.32$) than the distance runners. The smaller knee flexion angles in race walkers meant they experienced greater swing leg moment of inertia than the distance runners.

Keywords: Gait Cycle, Pedestrian, Vertical Upright Position, Propulsion Etc.

1. Introduction

Race walking requires a great deal of effort to compete successfully which includes a unique combination of technique, extreme physical exertion and mental focus. Unlike running, race walking is composed by support phase (heel strike, mid-stance and toe off) and swing phase. It is the part of the athletics programme at the Olympic Games and all major athletics championships. Championship competitions are held over 20km for men and women, and

50km for men only. Races for junior men and women (under 20 years of age) are held over 10km. Race walking is governed by strict biomechanical rules, as athletes are not allowed to have any visible loss of contact with the ground and must maintain a straightened knee from the initial contact with the ground until the vertical upright position Rule 230.54.2 [16]. The standard Race Walking Distances are: indoor: 3000m; 5000m; outdoor: 5000m, 10km, 10,000m, 20km, 20,000m, 50km, 50,000m (Rule 230.54.1).

History



Analysis of Aerobic Power and Swing Characteristics in Young Male Race Walkers

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Abstract: Economical walking is defined by the steady state of oxygen consumption with top speed and technique in competition is one of the most important factors to achieve higher performance for Pedestrians. The technique of race walking which is defined by World Athletics race walking competitions rules 230.54.2 not a naturally obtained human skill as normal walking and running of childhood. The purpose of the study was to analyze the association and relation of race velocity with aerobic capacity and kinematic properties. Top 10 race walkers of 10000m race walk discipline (Men- U 20), from 33rd National Junior Athletic Championships, Nov, 2017 held at Acharya Nagarjuna University, Vijaywada, A. P. India were digitized as the subject. For kinematic analysis, athletes were recorded as they passed through halfway 4.55 KM at back straight on the 400 m track by using two standard digital HD camcorders (Nikon B700, 60Hz) mounted on rigid tripods 90° angle 4 m away from the track inside & outside where reference volume was 5 m long and 1.5 m high. Whereas to measure VO_2 Max athletes' performance were taken as they passed through 1.5 miles or 2414.02 m on the track. The video data were analyzed by using motion analysis software (KINOVEA). Descriptive statistics and Pearson Product Moment Correlation coefficient ($p < 0.05$) were employed for statistical calculation. The tabulation of data was done by using the IBM SPSS software. The result of the study showed that the correlation between race performance and VO_2 max was quite high, $r(8df) = 0.726$. A Strong relationship was found between step length and RW performance, i.e. $r(8df) = 0.689$. Whereas variables like, flight time, linearity, maximum knee and foot height of swing leg were positively correlated with the walking performance. A high degree positive association was located in the torso and pelvic displacement $r = 0.768$ & 0.804 respectively. In toe off phase "r" value of knee angle with performance was 0.742 that showed a high degree coefficient of correlation. Whereas at heel contact and mid stance phase a low degree negative correlation found ($r = -0.489$ & -0.406). Most of the calculated "r" values were significant as the critical value of 8 df at 0.05 level is 0.631. Due to the direct association of race walking velocity (Mean = 3.427 m/s & SD = 0.235) with VO_2 max, step length, knee angle, torso & pelvic displacement may be this type of result found indifferent phases. Race walking performance was positively associated with the race walking economy (kinematic and physiologic variables), which implies that the fastest race walkers were more economical than the lesser performers. In relation to RW technique and forward propulsion, displacement of torso and pelvic region observed a significant role.

Keywords: Heel Contact, Mid Stance, Pedestrian, Toe off, Kinematic, VO_2 Max, etc.

1. Introduction

Economical walking is defined by the steady state of oxygen consumption with top speed and technique in competition is one of the most important factors to achieve higher performance for Pedestrians. The technique of race walking which is defined by Word Athletics Competitions

Rules [17] of race walking 230.54.2 is not a naturally obtained human skill as normal walking and running are obtained in childhood [13]. Race walking event requires utmost beauties in the skill part i.e. heel contact, mid stance and toe off of the advancing leg. Elite race walkers moved with a fluidity and grace that are the envy of anyone who has tried the low impact yet high intensity sport of race walking.

(Signature)

(Signature)

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Challenges of Burnout and Perceived Stress in Meeting the Professional Commitment of Female Prospective Teachers

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Introduction

Females in particular face a unique set of challenges at the work due to issues like family responsibilities and interpersonal relationships, explains Johns Hopkins psychologist Jennifer Haythornwaite, Ph.D., director of the Johns Hopkins Centre for Mind-Body research. Women aged 35-54 years - who are likely to be juggling many roles including mother, helper for elderly parents, homemaker and sometimes breadwinner - experience significantly higher stress than men. Stress happens whenever there is an imbalance between the demands of a situation and a person's resources for managing it.

Female teachers are left out with less time for personal obligations. Sometimes the inflexibility of the working environment is a huge stressor for women. Even women have to struggle with the pervasive issues, like sexism or discrimination. Women suffer considerably higher levels of work-related stress, anxiety and depression than men, with workplace sexism and familial responsibilities providing additional career pressures.

Stress is the adverse reaction people have to excessive pressure or other types of demands placed on them. There is a clear distinction between pressure, which can create a 'buzz' and can be a motivating factor, and stress which occurs when this pressure becomes excessive. The male teachers generally indicate their levels of exhaustion and stress at work are 5% lower when compared to that of the female workers.

Review:

According to Pascoe, Hetrick & Parker (2019), academic-related stress is a major concern for secondary and tertiary students. The ongoing stress relating to education has demonstrated negative impact on students' learning capacity, academic performance, education and employment attainment, sleep quality and quantity, physical health, mental health and substance use outcomes. Increasing students' stress-management skills and abilities is an important target for change.

A systematic review of prospective studies found that people who were stressed, such as during examination periods, were less likely to be physically active, the impact of which is associated with a plethora of potentially inter-related poor physical health outcomes (Stults-Kolehmainen & Sinha, 2014). Stress may also lead to the development of non-communicable diseases, including metabolic syndrome, obesity and reduced insulin sensitivity, resulting from unhealthy lifestyle habits and stress system dysregulation (Pervanidou & Chrousos, 2012). Similarly, stress has been shown to be associated with increased appetite (Dallman et al., 1993) and higher body weight (Stephens et al., 1995). Therefore, academic-related stress

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Principal

Characteristics of spatiotemporal dynamics of a quadruple Gaussian laser beam in a relativistic ponderomotive magnetized plasma

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An investigation of the spatiotemporal dynamics of a quadruple Gaussian laser beam via plasma in the presence of an external magnetic field characterized by ponderomotive and relativistic nonlinearities is presented. The moment theory approach is used to study the second-order nonlinear differential equation analytically and numerically. The evolution of the beam width parameter determines the pulse dynamics, in both time and space. The spatial evolution at different pulse times of a quadruple Gaussian laser beam in a relativistic ponderomotive magnetized plasma is reported. The effects of initial laser parameters, such as lateral beam separation, laser intensity, external magnetic field, plasma density, and time factor on self-focusing, are studied. Strong periodic self-focusing is observed for a gradual increase in the magnetic field, plasma density, and time factor, whereas an increase in beam intensity shows reversal effects. The phenomenon of self-trapping is also observed for different values of lateral beam separation and magnetic field. A three-dimensional portrait of the normalized intensity as a function of the normalized radial co-ordinate and lateral beam separation is well illustrated. It is useful in studying inertial confinement fusion. © 2020 Optical Society of America

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1. INTRODUCTION

The advent of highly intense laser pulses has ushered in research in multivariate fields including inertial confinement fusion [1], harmonic generation [2], and laser-based plasma accelerators [3]. Self-focusing [4,5] is one of the nonlinear phenomena that has useful relevance in the plasma physics domain. Relativistic, ponderomotive, and ohmic nonlinearities put a great impact on the self-focusing phenomenon. When a high-power laser beam interacts with the plasma, it increases the refractive index on the axis, characterized by the transverse intensity gradient and least in the marginal regions. As a result, the axial portion of the beam travels with lower phase velocity than the outer portions, giving rise to curvature in the wavefront leading to self-focusing of the beam. Therefore, one requires the laser pulse to propagate over several Rayleigh lengths without any divergence/loss of energy. At low intensities, the sources of nonlinearity are ohmic heating and ponderomotive force. Ponderomotive effects dominate when electrons are expelled away from the focal spot. This decreases the plasma density on the axis of the beam and also increases the local dielectric function. At high laser intensities, the relativistic effects [6] become important because electrons start oscillating with the velocity of light. The combined effect

of both relativistic and ponderomotive nonlinearities [7] contributes to the focusing of a quadruple Gaussian laser beam on a femtosecond time scale.

Most of the theoretical research work on self-focusing pivots around the Gaussian [8] and cylindrically symmetric Gaussian intensity distribution [9], whereas non-Gaussian, including quadruple Gaussian beams [10], Hermite Gaussian beams [11], super Gaussian beams [12], and dark hollow Gaussian beams [13], are less explored and investigated. Super Gaussian laser beams are suitable for radiation pressure acceleration of protons and ions, as they suppress the Rayleigh Taylor instabilities.

Low-power laser beams recurrently suffer from low quality, less stability, and heat dissipation defects as compared to high-power laser beams. To make low-power laser beams advantageous, it is suggested to combine them coherently. The combined power, quality, and stability of coherently combined beams is extremely high as compared to single low-power beams. When adding two or more beams coherently (to attain constructive interference), researchers encounter two major issues of relative phase locking and controlling the phase between different laser beams. In order to surpass this limitation, several intracavity techniques based on planar interferometric couplers

Simulation of Terahertz Propagation by TE Mode in Metal Dielectric Metal Waveguide

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Abstract- We examine the propagation of terahertz multimode in a metal dielectric metal (MDM) waveguide. In this structure, terahertz radiation propagates through the vacuum region sandwiched by two thin metal plates. At terahertz frequencies metallic plates acts as a perfect electric conductor. Different modes like transverse electric (TE) and transverse magnetic (TM) and multiple modes propagate which depends upon the plate separation and polarisation of incident wave. The TE mode propagation is studied analytically and numerically. Another structure where metallic plates are replaced by semiconductor plates, Surface Plasmon Polariton (SPP) modes are observed propagating through the waveguide. The proposed study is important in developing terahertz devices, such as sensors and modulator

I. INTRODUCTION

With invention of terahertz sources and receivers which receives sub-picosecond pulses, the propagation characteristics of these waves have attracted much interest [1]. THz propagation in guided and confined manner is required in its various applications. Waveguide technologies for both microwave and infrared spectral regions have been explored for THz guiding system. Various guiding systems such as coplanar waveguide, non-planer waveguides including metallic and dielectric waveguides have been studied for THz wave propagation. Various applications of THz radiations including spectroscopy [2], sensing [3] and signal processing [4] are based on these wave guiding techniques. Although the above mentioned waveguides are widely used but a complete solution to THz guided wave propagation is still lacking which can offer low loss, good confinement and low dispersion.

Parallel plate waveguide (PPWG) which is considered best of its kind have been employed for various applications of THz radiations [5]. Both TE and TM mode propagation is supported by these waveguides. Lowest order TM mode is usually preferred for PPWG because of its zero frequency cut off which leads to low group velocity dispersion and low loss but the confinement of this mode is an issue of concern. Another possible solution is the TE mode propagation. Various studies done for mid-infrared region in 1970's have signalled the possibility of realising TE₁ mode propagation with low loss and good confinement [6, 7]. The TE mode in PPWG has been found to play an important role in THz technologies. It can be used as a dielectric medium whose refractive index can be varied between 0 and 1 [8]. TE₁ mode is the perfectly coupled mode from a linearly polarised free space Gaussian beam, whereas Astley et. al.[9] has studied PPWG resonant cavity by using mode matching technique and they have found that TE₁ mode is

required for better coupling to a cavity of this type. Karl et al [10] demonstrated PPWG as leaky wave antenna. In their work, they found that the lowest order TE mode is employed to realise the leak behaviour of PPWG. Kaur et. al. have studied TM mode propagation through parallel plate waveguide using FDTD simulations [11]

These mentioned applications of TE mode have motivated us for this study. THz propagation by TE mode has not been explored far. In this paper we have done analytic calculation followed by numerical calculation to study the propagation of TE mode in MDM waveguide which is similar to PPWG. Also we have studied this structure by using semiconductor plates and have examined the excitation of SPP which propagates by TM mode. The paper is organized as follow: Theoretical model of the proposed structure is given in section II. In the next section III, we studied the spectra of transverse electric modes, obtained after Fourier transformation of time domain data collected at the end of waveguide. We have also shown electric field profile of different modes and in section IV semiconductor dielectric semiconductor (SDS) waveguide is studied and then followed by result and conclusion.

II. ELECTRIC FIELD EQUATIONS IN DOUBLE LAYER METAL STRUCTURE

Our proposed structure consisted of two metallic plates separated by air as dielectric with separation distance b

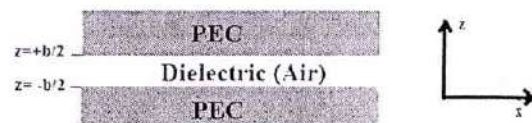


Fig 1: Geometry of MDM waveguide

Assuming the propagation direction along x-axis, electric field and magnetic field equations are written in the air filled region of structure as

$$E(x, y, z, t) = E(y, z)e^{i(\omega t - \beta x)} \quad (1)$$

$$H(x, y, z, t) = H(y, z)e^{-i(\omega t - \beta x)} \quad (2)$$

Following Maxwell's equations,

$$\nabla \times E = -i\omega\mu H \quad (3)$$

$$\nabla \times H = i\omega\epsilon E \quad (4)$$

Self-Focusing of Quadruple Gaussian Laser Beam in Relativistic Plasma using Moment Theory Approach

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Abstract— In the present paper, propagation characteristics of quadruple Gaussian laser beam in a relativistic plasma has been investigated using moment theory approach. Second order non-linear differential equation has been formulated analytically in the presence of relativistic non-linearity. The propagation of beam width parameter for a particular set of parameters has been studied with the distance of propagation. Effect of plasma density, laser beam intensity and lateral beam separation has been discussed graphically. We have found that the incremental of normalized plasma density and lateral beam separation enhance the focusing effect. The conclusions obtained are applicable in high harmonic generation, X-ray generation and inertial confinement fusion (ICF).

Keywords—relativistic non-linearity; self-focusing; quadruple Gaussian beam.

I. INTRODUCTION

High power laser plasma interaction is of immense interest due to its wide ranging applications in high harmonic generation [1], inertial confinement fusion [2] and plasma based accelerators [3]. Other important non-linear phenomena in laser plasma interaction are parametric instabilities, self-focusing [4, 5] and filamentation [6]. These instabilities lead to non-linear polarization of medium, which further guides the beam to propagate through medium. For the feasibility of the applications, laser beam should be constrained to move certain Rayleigh lengths through plasma. The basic physical mechanism responsible for self-focusing is the non-linearity of the medium and its interaction with laser. Mainly three types of non-linearities viz thermal, ponderomotive and relativistic are responsible for self-focusing of the laser beam. When the oscillatory velocity of electron approaches the velocity of light, relativistic increases in mass and dielectric constant of the plasma occurs, which further leads to relativistic self-focusing [7].

Phase locking and multiple beam propagation in plasma leads to cross-focusing phenomena, which further affects the self-focusing of beams. Researchers have studied the phenomena from last few decades. Sodha *et al.* [8] have investigated the focusing/defocusing of co-axial Gaussian laser beams in collisional plasma. Gibbon [9] has studied the multiple laser beams interaction with plasma to derive self-focusing thresholds by using moment theory method. Sati *et al.* [10] have investigated focusing of quadruple Gaussian in collision-less plasma using PRA technique. Vij *et al.* [11] have investigated the transverse magnetic field effects on

spatiotemporal dynamics of quadruple Gaussian laser beam in plasma.

Most of the study of quadruple Gaussian laser beam has been done by PRA technique. Quadruple beams are coherently coupled four beams. To increase the quality of low power laser beams, it is suggested to combine them coherently [12]. Coherently combined beams are more stable and powerful as compared to single low power beams. Quadruple beams have zero intensity on the axis. Therefore, PRA [13] being a highly approximated axis oriented technique fails to explain the propagation characteristics. To explore the hidden features of quadruple Gaussian beam, moment theory [14] and variational approach [15] are best suited techniques. Moment theory approach considers the effective dielectric constant as a whole whereas variational approach derives the quasi optical equation by using Gaussian trial function.

In this paper, we have studied the propagation characteristics of quadruple Gaussian beam in relativistic plasma by using global and comprehensive moment theory approach. Analytical and graphical discussion has been carried out by deriving second order differential envelope equation.

II. BASIC FORMULATION

The intensity profile of quadruple Gaussian laser pulse can be written as,

$$E_0 E_0^* I_z = 256 E_{00}^2 \exp(-r^2/r_0^2) \exp(-x_0^2/r_0^2) \left(1 + \frac{r^2 x_0^2}{4 r_0^4} + \frac{(x^4 + y^4) x_0^4}{48 r_0^8} \right)^2 \quad (1)$$

where $16 E_{00} \exp(-x_0^2/2 r_0^2)$ is the amplitude,

$r^2 = x^2 + y^2$, f is the beam width parameter, r_0 is the half width of each beam segment, where each beam segment is shifted to distance x_0 from z-axis and r is the radial coordinate of cylindrical coordinate system. The expression for dielectric constant of the plasma is written as,

$$\epsilon = \epsilon_0 + \phi(E_0 E_0^*) \quad (2)$$

where linear electrical permittivity is,

Teaching-Learning Strategies for the improvement of Science Education in Government Schools in India

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ABSTRACT: For sustainable development of education and more particularly the science education our 1st step will be to start with our own resources. Then we have to take stock of our resources, our deficiencies and challenges ahead, and plan how we can overcome them gradually. Constructivism in learning and ICT has brought about revolutionary changes in education and our country should fall in line with it. But more important question is how we should tune ourselves with vast change of techniques and approaches in education in the 21st century. The present author has discussed the sustainability in science education in Indian schools in seven steps: Our aims of science education, our classrooms, the curriculum we want, the facilities we have, the challenges we face, how can we overcome them & some unavoidable consequences.

KEY WORDS: Constructivism, ICT, Hands on Science, Appreciation, Specialists' curriculum, Global Classroom

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I. INTRODUCTION

The subject matter of science takes a central place in school education. The most widely acclaimed views of teaching science in schools is that it can inculcate in children certain values and attitudes – scientific temper, rationality, reasoning, problem solving, methods of science and so on. – that are essential for an enlightened citizenship; also teaching science in schools can fasten progress and development of a nation by creating scientific and technological manpower essential for continued economic growth^{1,2}. A wide range of influences went into the shaping and formulation of science education of Indian school classrooms – the historical and colonial influence, the Nehruvian project of creating a modern independent India, the neo-liberal economic mandate of creation of scientific and technological manpower and production of skilled labours, the way in which larger society and parents wish to shape the lives of younger children and so on. The objectives that figured most prominently and persistently in several of Indian science curriculum and policy documents is the role of science education in eradicating poverty, and emancipating masses from social ills of superstitions and illiteracy, and training and creating a cadre of scientists who will contribute to the nation building³.

1. Aims of Teaching Science in India

- Teaching the general mass the functional knowledge of Science and to dispel superstitions
- Creating specialists in Science
- Applying science to meet the needs of the people
- Competing with other countries for the economic advancement with science
- Science and technology to fight against problems of 3Ps, depletion of natural resources, illiteracy etc.

2. Some Concepts of Modern Classrooms

- Constructivist approach in teaching & learning science
- Problem Solving Approach
- Global classroom
- Teaching learning with ICT
- Teacher as a facilitator of learning
- Team teaching and peer tutoring

3.0 What type of Science Teaching Learning Conditions do we want?

3.1 Participation

More participation of students including boys and girls in science learning



Impact of pedagogical practices on academic achievement and thinking style of learners in physical science

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Abstract

Modern theories of learning claim that the construction of knowledge occurs as students build understanding in light of experiences occurring in the world. Different thinking skills like critical thinking, creative thinking, integral thinking, analytical thinking, and synthetic thinking are greatly influenced by the pedagogical practices. The acquisition of thinking skill is reflected in the achievement of learners in scholastic as well as co scholastic area. The present study makes an attempt to investigate the influence of pedagogical practices on achievement and thinking style of learner particularly in Physical Science. The study has taken constructivism as pedagogical practice and creative thinking as the thinking skills to be investigated. The findings reveals that constructivism based pedagogical practices influence the learning achievement and thinking style of learner significantly but the method has less effect on the students of lower level of intelligence.

Keywords: science education, thinking styles, creative thinking, constructivism

1. Introduction

Constructivism always lays importance on teaching through activities and experiments, by connecting students with the experience of their daily life. The experiment and activity methods preferred as the method of teaching by the Schools of philosophy such as Naturalism Pragmatism and Existentialism. Teaching the child through activity and experience is also advocated by philosophers and psychologists like Dewey, Rousseau, Gandhi, Tagore, Piaget Vygotsky, Bruner, Montessori etc. John Dewey advocate constructivism as the development of a reflective individual, with attributes of open - mindedness, whole heartedness and responsibility. He argued for learning by doing. Piaget emphasized that learning occurs by an active construction of meaning, rather than passive perception. Bruner laid emphasis on discovery learning and Vygotsky on the social and cultural perspectives of learning. These thinkers laid emphasis on learning environments supports multiple perspectives or interrelations of reality, knowledge construction, context rich, and experience based activities (Mishra, 2012). Performance and knowledge encoded by learners taught through constructivist approach are much ahead in overall teaching and learning activities than student taught by behaviorist approach. Constructivism in teaching significantly affects the elaboration skill, flexibility skill and creative thinking skill of students of students, but does not affect the originality of students significantly (Verma, 2012). Students in the constructivist learning environment showed better retention of almost all of the concepts related to Cantor set theory than the students in the traditional class (Narli, 2011) [7]. Questioning, problem solving, discussion, collaboration etc. skills are developed by constructivist method (Dhoot, 2010) [10]. Constructivist method brought in a great change in the outlook, attitude and vision of children and participation (Jameela, 2010) [9]. Constructivist learning approach has significant effect on student's achievement in mathematics as compared to a traditional method. The

students are satisfied and show positive perception towards constructivist approach (Nayak & Senapathy, 2010). Constructivist learning is an active construction of the meanings by the learner in a wide variety of ways (Pachauri, 2008). There is a need of an equitable science curriculum, in which both the content and the pedagogy are inclusive of all students enabling them to participate in ways that are appropriate for them (Sood, 2008). Constructivism based teaching-learning situations like student autonomy, classroom interaction, cognitive exploration lead to higher order thinking skills among students (Sridevi, 2007). It has been also observed that constructivist teaching strategies may be beneficial to the creation of student-centered learning environments and assist in broadening student inquiry and investment with lessons (Heard, 2007) [1]. Pedagogy is the method and practice of teaching, especially as an academic subject or theoretical concept. It is also the science and art of education, specifically instructional theory. An instructor develops conceptual knowledge and manages the content of learning activities in pedagogical settings. Pedagogical Practices are the learning activities that support the unit of content; the instructional approach such as active learning, constructivist model, student-to-student engagement; teaching to multiple learning styles, variety of assessments. These may include the methods, strategies, and/or styles of instruction that teachers use to teach students. Pedagogical Practices are selected according to the beliefs of the teacher, the needs of the learner and the demands of the task. The area of Pedagogical Practices is very broad which includes curriculum, methods of instruction and evaluation, organizational structure and interaction of the institution, learning environment of learners in and out of the school etc. in simple words it is the system of education itself. The success of pedagogical practices of any institution is reflected from the learning achievement of the learners which are being demonstrated in their cognitive, conative, emotional and social aspect.

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Physico-chemical properties of binary systems involving modifier (methanol or propionic acid) and an acidic extractant di (2-ethylhexyl) phosphoric acid (DEHPA): volumetric, acoustic and viscometric routes

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ABSTRACT

In solvent extraction, a suitable modifier, basically polar liquid is used with extractant like DEHPA, TBP, TOPO and MIBK to enhance the efficiency in extraction processes. This paper is related to the study of physico-chemical properties of polar – polar binary mixtures at 303.15K and 0.1 MPa. Molar volume, free volume, isentropic compressibility, intermolecular free length, specific acoustic impedance, relaxation time, Rao's constant, Wada's constant, absorption coefficient have been calculated from the experimentally measured data of density, ultrasonic velocity and viscosity of pure components and binary mixtures of methanol/ propionic acid + DEHPA. In addition, excess molar volume, excess Gibb's energy of activation of viscous flow, deviations in viscosity, isentropic compressibility, free volume, intermolecular free length and acoustic impedance were also computed from the experimental data. The observed variations of excess/deviation functions with the composition of DEHPA have been discussed in terms of molecular interaction between unlike molecules in two binary mixtures due to chemical, physical and structural effects. It is found that the molecular interaction of methanol with extractant DEHPA is better than that of propionic acid and so methanol may be used as a suitable modifier with DEHPA in the solvent extraction process.

Keywords: DEHPA; methanol; propionic acid; excess properties; molecular interaction

1. INTRODUCTION

The study on physico-chemical properties of liquid mixtures is of considerable importance in several industrial, engineering and technological processes [1-3]. The knowledge of fundamental data, viz. density, viscosity and acoustic properties of liquid mixtures is of considerable importance in the illumination of the structural properties of molecules and helpful in industrial applications [4-6]. Several researchers have investigated the nature and strength of molecular interactions in liquid mixtures by employing various macroscopic and microscopic techniques, such as ultrasonic absorption, studying fluctuation in refractive indices, dielectric relaxation by using microwave techniques, Raman spectroscopy, Fourier Transform Infrared, ultraviolet visible and nuclear magnetic resonance [7-9]. This work presents a comparative study on physico-chemical properties of binary mixtures involving modifier (methanol and propionic acid) and acidic extractant, di (2-ethylhexyl) phosphoric acid (DEHPA) at temperature 303.15K and pressure of 0.1 MPa. Di-(2-ethylhexyl) phosphoric acid (DEHPA) is an acidic extractant, used in the chemical, hydrometallurgical and nuclear processing industries and is a highly effective extractant and used in the solvent extraction of uranium and rare-earth elements, zinc, copper, lead, vanadium, yttrium, cobalt, beryllium and other valuable metals [10-12]. The extraction efficiency of the extractant improves with addition of suitable diluents and modifiers and furthermore, studies on fundamental data such as density and viscosity of liquid mixtures

are crucial in the extraction process on the molecular environment as well as molecular interaction [13-15].

In continuing effect to explore better polar modifier between two sets of modifiers [16, 17], i.e. 1-alkanols and monocarboxylic acids, various interaction parameters are reported in this paper. The discussions of these parameters are elucidated in terms of intermolecular interactions between components of binary liquid mixture. The degree and nature of the variation depend on the polarity and molecular size of the individual component. The results of our measurements of density (ρ), viscosity (η) and ultrasonic velocity (U) of DEHPA + 1-alkanols [16] and DEHPA + monocarboxylic acids [17] are used to calculate various interaction functions. From the measured values of U , ρ and η of binary mixtures of methanol/ propionic acid + DEHPA, various interaction parameters such as molar volume (V), free volume (V_f), isentropic compressibility (β_s), intermolecular free length (L_f), specific acoustic impedance (Z), relaxation time (τ), Rao's constant (R), Wada's constant (W), absorption coefficient (α/f^2), excess molar volume (V^E), excess Gibb's energy of activation of viscous flow (ΔG^*E), deviations in viscosity ($\Delta\eta$), isentropic compressibility ($\Delta\beta_s$), free volume (ΔV_f), intermolecular free length (ΔL_f) and acoustic impedance (ΔZ) have been computed. The variations in deviation/excess functions over the entire composition range of DEHPA have been discussed in terms of molecular interaction.

Acoustic assessment in binary mixtures of a polar nuclear extractant, DEHPA with eight non polar diluents at 303.15K - a comparative study

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ABSTRACT

Ultrasonic velocities (U), viscosities (η) and densities (ρ) of binary liquid mixtures of di-(2-ethylhexyl) phosphoric acid (DEHPA) with eight non polar diluents viz. n-pentane, n-hexane, n-heptane, benzene, carbon tetrachloride, cyclohexane, carbon disulphide and dioxane are measured at temperature 303.16 K and 0.01MPa for entire range of concentration. The measured data are used to compute acoustic impedance (Z), isentropic compressibility (β), intermolecular free length (L_f), free volume (V_f), internal pressure (π_i) and viscous relaxation time (τ). The excess properties are also evaluated from the measured data to study inter- and intra-molecular interaction between components of liquid mixtures. The research findings may be utilized in solvent extraction process to enhance extraction efficacy.

Keywords: Ultrasonic velocity; DEHPA; Binary mixtures; Thermo acoustic parameters; Dipole-induced dipole interaction.

1. INTRODUCTION

Novel liquid-liquid extraction processes have been developed to separate and then concentrate actinides and lanthanides from nuclear waste solutions in atomic energy industry. Solvent extraction technology is extensively used in pharmaceutical and petrochemical industries, bimolecular processes, organic synthesis etc. However, for quantitative recovery of nuclear materials, continuous as well as multistage extraction systems are used. The principles, applications and scope of liquid-liquid extraction techniques have been reviewed by several workers [1, 2]. DEHPA is one of the most widely used and characterized extractant in the atomic energy industry. It is a highly effective extractant used commercially to recover uranium, vanadium, yttrium, cobalt and zinc. It is also used alone or in combination with other synergistic extractant including tri-octyl phosphine oxide (TOPO), tri-butyl phosphate (TBP), acetyl acetone (HAA) and di-butyl phosphate (DBP). DEHPA is described as an acidic extractant, which can deprotonate to form anions in aqueous solution. This hydrophobic anion can chelate a cation from an aqueous phase in solvent extraction and the chelate being soluble in the organic phase is extracted. Several studies [3, 4] have suggested that chelation by the DEHPA anion is assisted by co-ordination with the non-deprotonated species. The

extraction of Zn^{++} is a typical example of DEHPA chelation and co-ordination. DEHPA being a highly viscous liquid is dissolved in an organic diluent. Its molecules exist as dimers in pure form. Emulsions having one of the biggest hurdles in solvent extraction due to which phase modifiers are often used to minimize or eliminate emulsions. Furthermore, the extraction efficacy of the DEHPA improves with the addition of suitable organic diluents and modifiers [5] for greater dispersal and more rapid phase disengagement. As such it is necessary to study the behaviour of DEHPA with several organic liquid mixtures at molecular level that might be helpful with respect to the enhancement of the extraction efficiency.

The ultrasonic study is one of the well-recognized approaches for the study of molecular interactions in fluids. Ultrasonic speed plays an important role in the investigation of intermolecular interactions. The structural arrangements are influenced by the shape of the molecules as well as by their mutual interactions [6, 7]. Therefore, an attempt has been made to carry out a systematic comparison on acoustic response in binary mixtures of DEHPA with eight non polar diluents viz., n-pentane, n-hexane, n-heptane, benzene, carbon tetrachloride, cyclohexane, carbon disulphide and dioxane for assessment of molecular interaction.

2. MATERIALS AND METHODS

2.1. Materials.

The chemicals used were of analytical reagent (AR) grade. The specification of chemicals used in the present study is reported in Table 1.

2.2. Properties measurements.

The binary liquid mixtures over different mole fraction range of DEHPA were prepared in air-tight bottles by mass

measurement. Adequate precautions were taken to avoid evaporation and environmental damages. The mass measurements were performed by using single pan digital balance (Mettler Toledo, AB54-S, and Switzerland) with an accuracy of ± 0.0001 g. The probable error in mole fraction was estimated to be less than $\pm 2.10^{-4}$. The detailed procedure for measurements of ultrasonic velocity, density and viscosity of liquid mixtures are the same as

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Voices of Teachers and Teacher Educators



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Pedagogical Practices in D.El.Ed. Programme of DIETs of Odisha: An Exploration

Abstract

The paper tries to explore the pedagogical practices of Diploma in Elementary Education (D.El.Ed.) programme of Odisha with specific reference to foundation courses, pedagogy courses and practicum. A mixed method was used wherein convergent parallel design has been employed. By using stratified random sampling technique, six District Institutes of Education and Trainings (DIETs) were selected-two each from the three revenue divisions of Odisha. From each DIET, all student teachers who were pursuing 2nd year D.El.Ed. programme and all teacher educators available during the time of data collection were taken for the study. In total 384 student teachers and 41 teacher educators participated in the study. The pedagogical practices were classified under 3 categories-inside class room, outside classroom and institutional practices. Rating scale was administered to student teachers of DIET to understand student teachers' perceptions on pedagogical practices. Classroom observation, Interview and Focus Group Discussion (FGD) are the other tools/ techniques used in the study for data collection. Data was analysed both quantitatively and qualitatively. Frequencies and percentages were calculated and in addition, content analysis was used to analyse interview and FGD data. It was found that a majority of student teachers expressed favourable response to pedagogical practices of D.El.Ed. programme. Teachers claim that a variety of methods are used to transact the curriculum. Analysis of data revealed that though some of the postulates of National Curriculum Framework for Teacher Education (NCFTE)-2009 are reflected in the overall pedagogical practices, more efforts are required in this direction to make process based elementary teacher education available at DIETs.

Introduction

India has witnessed enormous changes in the field of elementary education in the last few decades. There were lots of efforts suggested by policies, commissions and schemes to provide quality education to all children up to elementary level. The enactment of the Right of Child to Free and Compulsory Education Act in 2009 had changed the policy landscape and opened up possibilities to have a series of opportunities to strengthen the quality dimensions of elementary education in India. Considering the exponential growth envisaged in elementary education, quality has become a central point in any discussion concerning elementary education. To

achieve quality, there are several inputs that are prerequisites. Undoubtedly, one of the mandatory parameters in ensuring quality elementary education is quality pedagogic process in schools. It is also widely accepted that 'teacher quality' becomes a primary factor that determines efficient curricular transaction and ensures pedagogic processes at schools that elevate quality of elementary education. Evidently the quality of elementary education is a direct consequence and outcome of the quality of elementary school teachers. In the absence of an effective teacher all efforts will prove fructuous so far as pupils' learning is concerned. The role of the teacher has rightly been emphasized in the Programme of Action

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Green Consumer Behaviour and Environmental Awareness Among Potential Teachers

Prof. Ritanjali Dash* and Anisha Chauhan**

Environmental degradation is a much discussed and widely debated topic now. It is recognized that environmental degradation is an outcome of unplanned economic development, urbanization and bad consumption habits of humans. Over the last decade, consumption of goods and services has increased tremendously across the world, leading to depletion of natural resources and severe damage to the environment.¹ Some of the serious repercussions of environmental damage are global warming, increased environmental pollution, and decline in flora and fauna.² This is going to accentuate further in the coming decades as more number of people are going to join the middle class in the coming two decades. This is good for individual prosperity but it will increase demand for already constrained natural resources. If the global population reaches 9.6 billion by 2050, the equivalent of almost three planets will be required to sustain current lifestyles.³ It is reported that consumer household purchases were responsible for 40% of the environmental damage. However, consumers possess the capability to prevent or decrease environmental damage by purchasing green products or by shifting to green consumerism. Unilever estimates that almost 70% of its greenhouse gas footprint depends on which products customers choose and whether they use and dispose these off in a sustainable manner. In this research paper, the researcher makes a study of the consumption behavior of students studying in a teacher training institute of Bhubaneswar. As teachers are the messengers for environmental conservation and protection, an effort is made in this study to find out the extent of awareness of the potential teachers on environmental conservation and green consumer behaviour. This paper tries to examine the factors which are responsible for the 'green attitude behavior gap', factors that motivate and demotivate people to move towards green consumerism.

CONCEPTUALIZATION

Green consumerism refers to recycling, purchasing and using eco- friendly products/green products, that minimize damage to the environment. This involves decisions such as using energy star appliances that consumes less power, buying hybrid cars that emit less Co2, using solar and wind power to generate electricity and buying locally grown vegetables and fruits. It refers to a state in which consumers demand products and services that have undergone an eco- friendly production process or one that involves recycling and safeguarding the planet's resources. In other words, green consumerism entails the production, promotion, and advancement of the utilization or use of goods and services based on their pro- environment benefits.⁴

The number of individuals willing to purchase green products has increased in the last few years, there is little evidence to suggest that purchase of green products has increased; despite environmental concern and positive attitude of customers towards sustainability and green products, market share of green products remains confined to just 1-3% of the entire market.⁵ This suggests that environmental considerations play a minor role in consumer purchasing decisions and people generally overlook environmental impacts of their purchase.

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**BA B Ed.

Employability in India and New Education Policy - 2020

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Abstract

Looking at the employment scenario in the country, it is felt by all that all supply side constraints and demand side constraints should be taken care of. Supply side constraints include raising the employability of students whose solution lies in bringing about a change in the educational landscape of the country by imparting right kind of knowledge, skill and attitude for employability. The Skill India Report 2020 corroborates the fact that students even at the higher education level do lack such knowledge and skill that are required for employability. The New Education policy 2020 has envisaged to impart such necessary knowledge, skill and attitude for enhancing the employability of students.

KEYWORDS: Employability, Skill India Report, New Education Policy 2020

Introduction:

The importance of information and knowledge in augmenting the process of development had already been highlighted in National Education policy 1986. It also had given emphasis on development of skills of students along with knowledge and value. Vocational education was also promised to be promoted in order to create a skilled manpower to cater to the needs of the production sector.¹ However, the Skill India Report 2020 gives a gloomy picture of the employment sector in India where it is found that even the highly educated is found to be not employable, or they are not found suitable for employment by the employers. This means they are lacking in skill, understanding and personal attributes – that makes them more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy. If this is the fate of the highly educated, we can very well imagine as to what happens to those who become drop outs after the secondary stage or those who never get the opportunity to get enrolled to the next stage of education. This paper tries to analyze the Skill India Report 2020 to study the employability scenario in India and discusses as to how the New Education Policy 2020 has tried to address the issue of employability.

Objectives:

The objectives of this paper are the following:

1. To make an analysis of the Skill Report to assess the employability scenario in the country.
2. To find out as to how the New Education policy 2020 addresses the issue of employability.

Methodology:

This is a purely exploratory study. The paper basically makes an effort to analyse two reports prepared by the Government of India, one is the Skill India report 2020 and the other one is the New Education policy 2020 which promises to address many issues relating to our education system, one of which is employability of our children.

The Skill India Report 2020 has made an in-depth study of employability amongst the fresh candidates joining the workforce. This is a joint initiative by People Strong, a Global Talent Assessment Company, in collaboration with Confederation of Indian Industry (CII) along with partners like UNDP, AICTE, and AIU. It analyses the readiness of the fresh candidates for various job types available in the new job market and the skills that employers seek in prospective candidates for employment. Taking seven important domains such as undergraduate or equivalent, ITI, Polytechnic, PG or equivalent (MCAC/ M.A/ M.Com/C.A/ M.Tech, Management or equivalent (MBA,PGDM), Graduates (B.Sc./B.BA/B.Com/B.Tech), the report highlights the two sides and compares them to understand the prevalent gaps, discusses and puts forth possible solutions that could help in improving the employability scenario in India.

Analysis of Skill India 2020 report:

A detail analysis of the key findings shows that around 46% of India's youth are only job ready or employable and this figure has remained static since 2017-18. MBA-holders are the highest employable group among the various course graduates with an employability score of 54%. Engineers who were at the top in 2019 came down to the second position. Employability for pass-outs of B.Pharm, B.com, BA and Polytechnics has improved a lot and it has remained at about 15%. Further, a decline in employability was seen in B.Tech, Engineering. MCA graduates, Technical & Computer-related courses as per the skill report. On the basis of the educational qualifications in demand, engineers have been expected to be hired the most (30%), closely followed by general graduates (BA/B.com/B.Sc.) (26%). The state of employability in the group mentioned in the Skill report has not improved over the last few years, despite a rise of enrollment.

The employability figure for the male and female candidates has undergone a change as compared to the previous year. It was 48% and 46% respectively for male and female in the year 2018. It became 46% and 47% respectively for male and female in the year 2019. It shows that employability among women is on the rise and they are no less than male in terms of employability. But despite this, the intent for 2020 reflects a likely hiring ratio of 71:29 for Male to Female candidates. This will be more prominent in the Auto sector. These findings heightened the concern over gender parity in the forthcoming years. Creating equal employment opportunities for men and women, and supporting women workforce is a major focus of the skill report.

Talking about the regional disparity in employability of candidates, the skill report points out that states like Maharashtra, Tamil Nadu and Uttar Pradesh were more employable than any other states. Similarly, cities like Mumbai, Hyderabad and Pune were the most

Labour Issues and Labour Laws in India**Ritanjali Dash^a, Anisha Kar^b**^aProf of Economics, Regional Institute of Education (NCERT), Bhubaneswar-751022; India^b4thYear BA LLB, KIIT School of Law, Bhubaneswar-751024, India**Abstract**

Labour is a very significant factor input in production and it forms the backbone of any Economy. But the condition of labour is grim in India. Labourers in India, in spite of their contribution to the economy are confronted with various problems. There are many labour laws in India to address these problems, protect the labourers from exploitation, and strengthen the values of industrial relations. These laws are basically socio economic legislations relating to the various industrial disputes and problems of labourers. This paper delves into the existing labour laws in India, discusses the effectiveness of such laws. It discusses the recent call for reform in the outbreak of the corona pandemic which has a possibility of further aggravating the condition of labour in India, at the same time jeopardising the fundamental rights of labourers.

KEYWORDS: Labour Issues, Labour Laws, Fundamental Rights, Directive Principle of State Policy.

I. Introduction

Labour issues are many in India due to the large size of the labour force, and the lack of the absorptive capacity of the Economy to absorb the surplus labour force. The condition of workers/labourers in India was never good during the colonial rule. Deprived of all fundamental rights they were forced to surrender to various forms of atrocities and at times were getting united to fight for their rights. However, in the absence of elaborate legislations their voice was mostly remaining unheard. But even after Independence despite enactment of various labour laws the condition of labour has not improved much. In 2012, about 487 million workers were there in India. Out of this over 94 percent workers were engaged in unincorporated, unorganised enterprises. The unorganised sector, inspite of its large size accounted for just 57 percent of India's national domestic product in 2006. Productivity of this sector is very low and it offers lower wages. Poverty rates are reported to be significantly higher in the unorganized sector. Most of the workers in Agriculture, dairy, horticulture and related occupations belong to the unorganized sector and these sectors alone employ 52 percent of labour in India. According to the 67th report of NSSO, the unorganised manufacturing, unorganised trading/retail and unorganised services employed about 10 percent of all workers, as of 2010.

Two categories of migrant labourers are present in India. One of these being the one that migrates to temporarily work overseas, and the other migrates domestically on work available basis. Domestic migrant workers are further classified as workers employed either full-time or part-time and temporary or permanent workers. They get remuneration

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in cash or in kind, in any household through any agency or directly, to do the household work, but do not include any member of the family of an employer. While some work for a single employer, others work for more than one employer. The compensation, condition and duration of work are typically at the will of the employer and the worker.

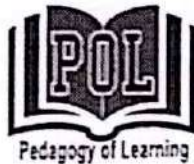
The number of internal migrants in India was 450 million as per the 2011 Census. This is more than double the population of Bangladesh, under half the population of Europe and more than that of the U.S population. It shows a growth of 45% over the 309 million recorded in 2001. This growth is much more than the population growth of 18% from 2001 to 2011. A large chunk of migrant workers are going to Middle East due to the attraction of better salaries, possibility of earning overtime pay, and opportunity to remit funds to support their families in India. However, after completion of the projects, they come back to India without any employment or social security benefits. Often complaints of abuses such as unpaid salaries, unsafe work conditions and poor living conditions etc. are noticed.

II. Labour Laws in India

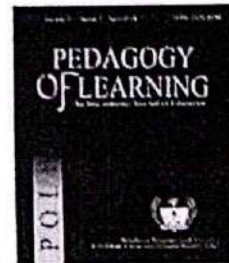
There are various labour laws in India to deal with such problems of workers. For instance, these laws have provisions regulating the conditions of work, safety and welfare of workers, settlement of disputes, formation of associations and trade unions, collective bargaining etc. These laws also protect the interest of the migrant workers. The Constitution of India guarantees a series of fundamental labour rights, particularly the right to join and take action in a trade union, the principle of equality at work, and the certainty of earning a minimum wage with decent working conditions.

Articles 14-16, 19(1)(c), 23-24, 38, and 41-43A of the Constitution of India deal with labour rights. These articles which are meant for all citizens also guarantees the workers with various rights like the right of equality, right to form associations or unions, protection from trafficking and forced labour (under article 23), etc. Article 24 of the Constitution, prohibits child labour under 14 years of age in a factory, mine or any other "hazardous employment".

Articles 38-39, and 41-43A, listed in Part IV of the Constitution are not enforceable by courts, and are in the form of Directive Principles of State Policy. Article 38(1) enjoins upon the state the duty to "strive to promote the welfare of the people" with a "social order in which justice, social, economic and political, shall inform all the institutions of national life. Similarly article 38(2) enjoins the duty on the state to "minimise the inequalities of income". Article 39(d) provides that men and women should receive equal pay for equal work. Article 41 guarantees a right to work. The National Rural Employment Guarantee Act 2005 has been enacted with a view to guarantee such right of workers. Article 42 requires the state to make provision for securing just and human conditions of work and for maternity relief. Article 43 deals with the workers' right to a living wage and conditions of work ensuring decent standard of life. Article 43A, included in the 42nd amendment of the Constitution of India in 1976, says that workers have the right to codetermination.



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Environmental Ethics of Teacher Trainees: An Enquiry

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ABSTRACT

Recognizing the importance of imbibing environmental ethics for sustainable lifestyle in the present scenario NCTE (2004) emphasized environmental education for pre-service teachers and in-service teachers and its inclusion in the teacher training program. The study involved 120 trainees purposively selected from the 4-year Integrated B.A./B.Sc.-B.Ed. Course in the Regional Institute of Education, Bhubaneswar. Results of the study revealed that overall the pre-service teachers have a high level of environmental ethics ($M=125.4$). It further revealed that there is significant difference in the ethical level between the male and female pupil-teachers. Further, it revealed that there was no significant difference in the environmental ethics in terms of pupil-teachers' streams and locality.

Keywords: Teacher trainee, Environmental education and Environmental ethics.

BACKGROUND OF THE STUDY

Human is a product of organic evolution and environment. Although, his very existence on earth depend on the quality of the environment; almost all environmental problems and issues are consequences of human's indiscriminate exploitative behavior and attitude towards nature. Environmental awareness and knowledge about environment is a prerequisite in environmental literacy, bringing desirable changes or alteration of attitude and behavior of individuals towards environment; thus directing to solving environmental problems (Murphy, 2002; Ramsey et al., 1992). Adequate environmental knowledge prompts appropriate behaviours. In essence, Environmental Education was recommended and introduced as compulsory subject at all levels of education including the Teacher training programs (Supreme Court 1991&2009; NCTE, 2004).

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STUDENT'S AWARENESS AND USAGE OF WEB2.0 TECHNOLOGIES FOR BIOLOGY LEARNING

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Abstract

The study examined students' usage web2.0 tools in education, level of awareness and adoption in their classroom learning. The results indicated that wikis, social networking sites, email and presentation tools are frequently and most used web2.0 tools. Moreover, the awareness is high in case of different types of email and social networking sites compare to other web2.0 tools. There exists significant difference in student's awareness and usage of web2.0 application in learning biology at senior secondary school level. The students indicated the positive polarity towards the adoption of web2.0 tools in classroom learning and beyond it. It can be concluded that student awareness and adoption of web2.0 tools can support the instructor to integrate technology with pedagogy and content effectively.

Keywords: Awareness, Usage, students, web2.0, learning.



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Introduction

Learners in the 21st century are blessed with online technologies which has increased the frequency of communication, content creation and collaboration. The information gateway broadens the path and welcomed every learner in the learning community. Today, learning community has become a global network with huge collective information. The advent of web 2.0 has provided the platform where everyone can create, share, remix, collaborate and contribute. Shifting from static to participatory web platform, the users become more active contributor to collective intelligence and same time frequent retriever of collective information. An interactive and generic feature of web2.0 tools extrinsically motivated and invited the individual to extract the user generated collective intelligence. Realising the potentiality of web2.0 application, the learner and the teacher can enhance their classroom interaction in order to gain shared experiences and continuously construct their own knowledge. For learner, this web2.0 applications expand their learning horizon and offer unique way to construct their knowledge. The architecture of web2.0 services offers

Digital Mind Mapping Software: A New Horizon in the Modern Teaching-Learning Strategy

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Abstract

Digital mind mapping is a unique method which improves productivity by helping to build and analyze ideas, and facilitates information structuring and retrieval. Educators and learners can use different types of software to create digital mind map for teaching learning. The objectives of the paper are: to describe about different types of software used in creating digital mind maps; to highlight the process of digital mind map development through software and to provide an overview of benefits and usefulness of digital mind mapping software. It's a review-based study. Articles published in various leading journals, conference proceedings, online materials have been referred in the present article. The first part of the paper describes concept of digital mind mapping software. Second part of the paper provides a brief description about different software used in creating digital mind maps. The third part of the article explains about the process of digital mind map creation through software. The last part of the paper elaborates benefits and usefulness of digital mind mapping software. It reveals that digital mind mapping software can be used by institutions/teachers/students for teaching and learning as it simplifies the information easily for better understanding. The article points out that digital mind mapping software gives learners the ability to engage directly in the learning process by developing digital mind maps. The paper also indicates that digital mind mapping software can be used as brainstorming tool to construct visual diagrams of ideas. The paper would be great use for educators as well as students for teaching, learning and assessment at different levels of education.

Keywords: Digital Mind Mapping Software, Teaching-Learning Strategy, Process, Benefits, Usefulness.

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INTRODUCTION

Digital Mind mapping is a method of teaching and learning, used to organize knowledge and concepts in a simple way to grasp and contextualize the ideas. Digital mind maps display the links between ideas, words and information through the combination of text and graphics. It can be utilized at all levels of education and has proved to be appropriate learning resources for talented and disadvantaged students. Adult learners can able to make a connection between learned facts and newly obtained information through digital mind mapping [1]. Basically mind maps are developed through paper and pen. Recently computerized versions of mind maps became popular which also increased learners' level of interest in creating mind maps [2, 3]. So, it can be said that there are two types of mind maps. First one is traditional mind map which is developed on paper or board by hand. Another one is digital mind map which is developed on computer, mobile or other electronic devices through appropriate software. In

digital mind maps branches of ideas automatically originate from centre part of the screen [4]. Digital mind mapping software is used to construct diagrams of connections between thoughts, ideas or other knowledge. In contrast to traditional note-making, the software of mind maps can enhance learning and study performance. As a learning tool, digital mind mapping software helps learners to express their ideas visually. It can also transform boring concepts and ideas into colourful, exciting and impressive flowcharts [5].

This paper describes different types of software used in digital mind mapping strategy, highlight the process of digital mind map development through software and provide an overview of benefits and usefulness of digital mind mapping software.

Digital Literacy and Its Use by Teacher Trainees at Secondary Level in Odisha

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ABSTRACT

Digital devices and applications have been used in schools and teacher education institutes across the globe for teaching learning. All the prospective teachers must be digitally savvy to utilize it in school for teaching, assessment, management and professional development. This study intended to find out the level of digital literacy and its uses among teacher trainees at secondary level. Descriptive research method was followed for undertaking this study. Survey was conducted on sample of 170 trainees selected randomly from teacher education institutes under Utkal University, Odisha, India. Self developed questionnaire based on different aspects of digital devices and applications such as skills of trainees in digital technology, use of digital technology and applications by trainees for learning and teaching etc. was used as tool. Collected data were subjected to frequency and percentage analysis and accordingly conclusions were drawn. The study found that (i) majority of trainees can change screen brightness and contrast, minimize, maximize and move window screen, use search command to locate a file and download and install applications, (ii) more than 50% of trainees do not know learning management system, virtual worlds, podcasts and web design applications, (iii) around 70% of trainees are aware about storage of video in camera, manage junk mail and update username and password and less than 50% of trainees knew about voice typing and cyber security, (iv) majority of trainees use group email and whatsapp for academic work and only 20% of trainees use digital devices for using PPT in class, create digital learning materials, provide feedback to students. It is suggested that teacher education institutes must be equipped with digital devices and applications useful for teaching learning and professional development. Further, teacher educator must encourage and motivate trainees by integrated ICT in regular course work and across the subjects so that trainees can develop skills of using it for teaching, learning and assessment in schools.

KEYWORDS

Digital Literacy; Digital Devices; Applications; Teacher Trainees; ICT

INTRODUCTION

Conceptualization of the Problem

Digital literacy is the engine of the modern civilization and the driving force of the information age. Today the meaning of literacy is not just limited to the ability to read and write. It extends to an effective application of all those activities in which literacy is normally assumed. The modern meaning has been expanded to include the ability to use language, numbers, images, computers, and other basic means to understand, communicate, gain useful

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Pedagogical Beliefs of Pre-service Teachers towards Teaching Physical Science at the Secondary Level

AMLESH KUMAR* AND B. N. PANDA**

Abstract

The purpose of the study was to examine the pedagogical beliefs of pre-service science teachers about the nature of teaching and learning physical science, understanding how the physical science subject should be taught and characteristics of a good physical science teacher at the secondary level. Descriptive survey with mixed method approach was followed for data collection and analysis. 97 pre-service science teachers of RIE, Bhubaneswar were the participants of the study. The findings showed that pre-service science teachers had strong pedagogical beliefs towards the nature of teaching and learning physical science, were sensitive towards the effective use of pedagogy in teaching physical science and had knowledge about the characteristics of a good physical science teacher at the secondary level.

CONCEPTUALISATION OF THE PROBLEM

Pedagogical beliefs are beliefs about teaching and learning. Pre-service teachers enter teacher education programmes with prior beliefs about teaching and ideas on pedagogical approaches. Different pedagogical beliefs may have significant influences

on different approaches to the planning and conduct of lessons. Pedagogical beliefs of pre-service teachers are closely related to their learning experiences. Their pedagogical beliefs, practices and attitudes are important for understanding and improving

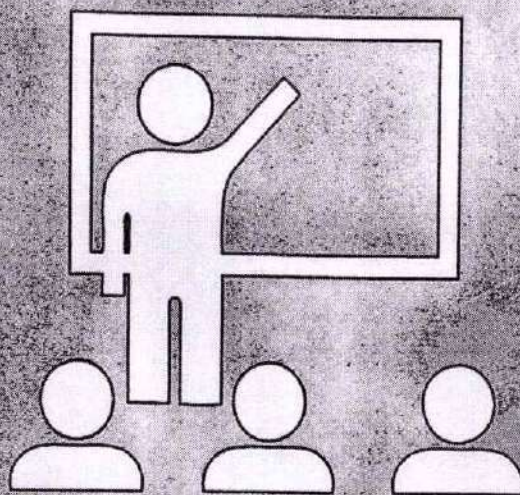
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Secondary Education in West Bengal: Status and Challenges

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Abstract:

Secondary education is that stage of education which helps children to become full members of a complex modern society. It enables the individual to enter life as knowledgeable, active minded, sociable individual. It is obvious that secondary education forms the central link in the chain of education. Secondary education is of decisive importance in the economy of a developing country. The objectives of the paper are: to ascertain recent status and challenges of secondary education in West Bengal; to provide possible suggestion to overcome the challenges of secondary education in West Bengal. Different type of articles, reports, research papers, books, official websites and online materials were used to conduct this study. The paper has been divided into four parts. The first part of the paper highlights about the historical background and importance of secondary education in West Bengal. The second part discusses about the recent status of the secondary education in West Bengal. The third part elaborates about major initiatives taken by the Government for improving the secondary education and different challenges relating to it. The last part of the paper provides suggestions for overcoming the barriers of secondary education in West Bengal. The paper concludes that total number of Gross Enrolment has shown an upward move during 2012 to 2016 in West Bengal. The Dropout rate of West Bengal is moderate (16.61%) as compare to the neighbouring states like Odisha (49.48%), Assam (30.43%), and Bihar

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Reflective Practices – A Tool For Introspection Leading To Professional Development

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Abstract

Reflection is the systematic introspection to transform experiences into learning for the enrichment of the professionalism and humane qualities of teachers. NCFTE-2009, particularly, focuses on the development of the ability for self-analysis and reflection on the part of the trainee teachers so that they can grow as professionals and humane teachers. This paper seeks to explore i) the perception of the trainee teachers towards the importance of reflective practices to bring professional development. ii) study the influence of reflective practices in helping the trainee teachers to bring professional development. Descriptive research method has been followed for the present study. As a qualitative research the participants have been selected purposively. A semi-structured interview and observation schedule have been developed to collect in-depth data. The data have been analyzed through discourse analysis method which shows that reflective practices have an effective contribution in the professional development of the trainee teachers. It also helps them to grow inwardly towards humane development so that they can lead an enlightened life and become the torch-bearers in the true sense.

Key words: Reflective Practices, Introspection, Professional Development, Humane Development.

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