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Editor's Message ……

Education is an essential process of social life because it has a formative effect on the mind, character or physical ability of an individual. Currently, education is depends on moral philosophy to develop individual's abilities to better serve society. Keeping this Vision and Mission in mind, our institute brings out e-journal, JBNB-2019 on the occasion of National Science day, 28th February, 2019.The theme of the journal is 'Educational Ethics and Ethics in Education'.

This issue includes professional educational ethics, role of biotechnology and biology, managing human resource, code of ethical conduct in higher education in India: issues and concerns, role of teachers and students in education, also on phototransistor,

We shall keep trying to build up substantial support for the journal to strive for a more consistent higher standard of publication.

We greatly appreciate the efforts of all the authors and students for their immense efforts and contribution.

"*The whole purpose of Education is to turn mirrors into windows*." - Sydeny J. Harries

To have a sense of education, ethics is important

Dr. (Mrs.) M.K.Pejaver

Dr. (Mrs.) A.S.Goswami-Giri

Editorial Board

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ETHICS IN PROFESSIONAL EDUCATION

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ABSTRACT

The Professional Education for Masses is a huge challenge to the developing countries like India, which is second largest populated country in the World. With large young population it is important to have robust quality education system. Indian Education System has illustrious history with teachers deserving huge respect for their role in Students lives. The Advancing Technologies, attractive offers, limited loyalty .have become true concerns. Under this pretext the paper discusses various attributes which are ingredients for Professional Education. If these expectations are not fulfilled the Institutes and Universities will produce graduates with least sensitivity to the society and may become liabilities rather than becoming the pillars of future systems.

Key Words : Quality Education, Values, Ethics, Expectations

INTRODUCTION

"A teacher to be effective should always be a learner. If the teacher ceases to be a student, he/she ceases to be a good teacher".

Dr. S. Radhakrishnan

Education is the most important need for a healthy society due to its implications on the wellbeing of next generation [1].Teaching is a skill driven task which embeds Knowledge and Art. For any teacher the Career evolution transitions through Entry, Stabilization, Experimenting, Diversifying, Reflection, Serenity, Conservatism and Disengaging. It demands professional competence, values, moral principles which we can refer as Ethics. Professional Ethics will help the teachers to mature, shape competencies, consciousness and deliver expectations [1]. All these shall be visible in day to day actions with an attitude for self-growth.

Values as principles, fundamental convictions, ideals, standards of life stances which act as general guide to behavior or as a reference point in decision making or the evaluation of beliefs or actions [2].

Ethics is centered on moral values with a focus on Application and Outcomes of adherence of such moral value systems. Ethics is concerned about right, fair and also focused on once actions. Ethics is the reasoning of morality in judging between Right and Wrong [3]. It may be noted that for the benefit of society students shall be educated with proper value systems. Graduating students shall possess good knowledge with intensive critical thinking abilities for public service. Students must be equipped with abilities to distinguish between Right and Wrong, Proper response to situations for serving the Society with honesty [4].

Teachers traditionally hold high moral standard in the Society and community at large [5]. This means a position of great responsibility and Trust. To fulfil this trust, teacher shall be of good moral character to shape Career of pupils. Education shall be the amalgamation of pursuit of truth, respect and dignity to all, with devotion to Excellence.

Primary objective shall be a scholar centric approach for the complete development of Student potential. Teachers shall commit to Academic openness, unconditional knowledge sharing for learning process and respect for difference of opinions. It is also imperative to avoid harassment, embarrassment, discrimination and play role of mentor to the students. Teachers must maintain professional barrier between self and students which is key to learning.

Teaching is a group activity. The faculty in the departments shall be fair to colleagues by being a team player. Many a times excellent teachers prove to be trouble makers in the team due to narrow minded approach and let the team performance get affected for individual traits.

According to Nordand Haynes[6]., the Moral Education has twin dimensions. The former is the Moral Socialization and latter is the Development of Intellectual resources. The Moral socialization includes Training, nurturing key norms, Character building, Understanding Values and their significance, Study the lives of Role models etc. These are important attributes for Character building .The Intellectual Resources Development includes understanding of Knowledge Resources, acquiring of Skills, Competencies, Self-Control, Owning responsibilities, Decision making abilities and Commitments [6].

Creating a stimulating learning environment is crucial for quality learning [7]. The undisputed fact is that teachers are the backbone of good quality education system. It may be realized that the new age technology has added additional dimensions to the learning process. The Techno-savvy next generation and Chip-of-the-old- block faculty can be a mismatch to the present situation. Teachers need to upgrade to prevent obsolescence and to fine tune the present student community needs. The Teacher-Student relationship is built on a strong Trust foundation with high ethical standards.

Teaching Profession

- Teaching is one of the oldest and noble professions. A teacher is a friend, philosopher and guide to students.
- To become successful, teacher should understand student's temperament and deliver knowledge such that the students love to learn.
- Every teacher should learn Educational Psychology for effective teaching.

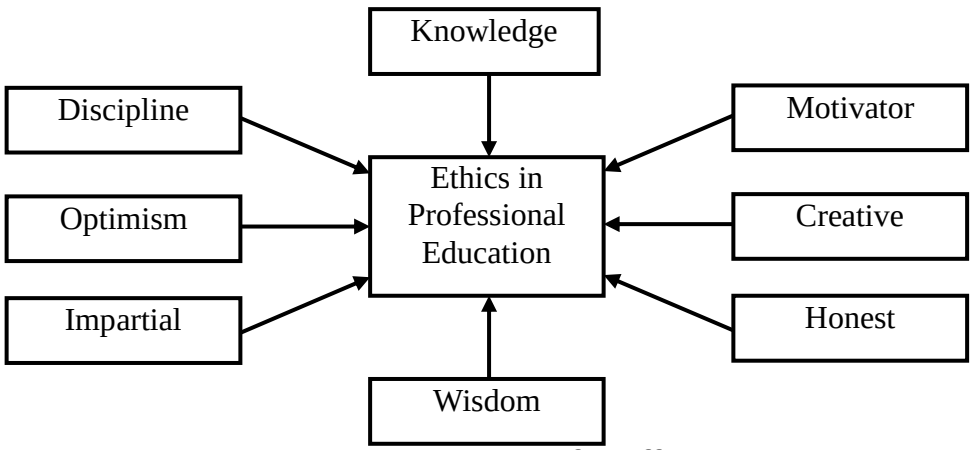

Figure 1. Essential Attributes for Effective Teaching

Qualities of a good teacher

- Unconditional knowledge sharing
- Impartial and prudent action
- Motivation and encourage participation
- Walk the talk/practice what is preached
- Wisdom

Role Model Teachers possess

- **Cheerful and pleasing personality**

  Should have a pleasing and cheerful personality as it develops a state of mind among Students for learning process. A lively teacher can really bring the best from every Student.

  Clean Habits
  To be clean is a virtue. By cleanliness individual will be free from any ill habits. Clean habits can help in maintaining mind balance.

- **Control on anger and forgiveness**
  While interacting with the Students, there may be occasions which may anger the teacher. For properly handling the situation teachers should exercise restraint and perseverance so as to avoid uncomfortable eventualities.

- **Honesty**
  Teachers must be honest in whatever they think, speak and in their actions.

- **Conquest of mind**
  This can normally be achieved by experience and meditation. Of all the things in the world, human mind is the most wavering. For imparting education, we must have noble thoughts, which can be achieved only by proper control over mind.

- **Character**
  One of the highly essential qualities to win the trust and confidence of Students that they can depend on teachers for taking care of their educational needs.

Teaching Ethics

Ethics is the art of doing the right things at right time.

- Planning: To do List of activities.
- Prioritizing: Important, Urgent.
- Scheduling: Doing difficult things when the efficiency is maximum. (peak hours)
- Ethics may be defined as the study of the general nature of morals and of the specific moral choices to be made by an individual.
- To put somewhat differently, ethics can be viewed as the moral quality of a course of action.
- Ethics is basic to any profession.
- Ethics are personally and professionally rewarding.

The changing ethics

- The ideals and objectives of yesterday were still ideals of today, but they lost some of their luster and even, they lost the shining beauty which has warmed the heart and vitalized the body.

Integrity

- Honesty, fairness, justice, impartiality, carefulness and thoroughness.
- Basis of faith and trust for dependability, honour and confidence.
- Kindness, courtesy, sincerity.

Teacher's Attitude and Consequences

- **Positive attitude** is like fruit of all seasons and always welcome.
  - Increases efficiency
  - Foster team work
  - Solves problems
  - Improves quality
  - Breeds loyalty
  - Congenial atmosphere
  - Reduces stress
  - Pleasing personality

  → **Assets**

- **Negative attitude**
  - Bitterness
  - Resentment
  - Purposeless life
  - Ill health
  - High stress levels
  - Negative environment

  → **Liabilities**

CONCLUSIONS

From the elaborations it may be noted that Moral values and Ethics are crucial for effective quality education. Our predecessors have spent life dedicating to the noble profession and we have a huge responsibility in upholding the sanctity. Established teachers shall mentor juniors during induction and their probation. Teachers must develop the attitude of appreciating in public and reprimand in private for avoiding unforeseen situations. Maintaining professional boundaries, demonstrating respect for cultural diversity, working in collaboration with colleagues, parents and students is mutually rewarding.

When we are motivated by compassion and wisdom, the results of our actions will benefit everyone.

Dalai Lama

REFERENCES

[1] Elena Seghedin, (2014), The Teachers Professional Ethics To The Personal Professional Responsibility.

[2] Halstead and Taylor, (1996), Ethics and values: The need for student awareness of workplace value systems.

[3] Buckeridge, J. S., (2002), Ethics and the Professional.

[4] Ayling, D., (2006), Fostering moral courage: What do business students learn about professional ethics in cooperative education placements. In R. K. Coll (Ed.), Annual New Zealand Association for Cooperative Education Conference (pp. 116-120). Queenstown: New Zealand Association for Cooperative Education.

[5] Adams V., (1981), The Code of Ethics & Principles of Professional Conduct.

[6] Nord, Warren A. and Charles C. Haynes, Charles C., (2015), Moral Education.

[7] Government of Malta, (2012), Ministry of Education and Employment, Teacher's Code of Ethics and Practice.

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ROLE OF BIOLOGY IN SCIENCE EDUCATION IN INDIA

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ABSTRACT

Understanding biology and its complex processes is the key to understand nature and its creativity. Ensuring that everyone, not only those that go on to pursue science as a career, understands how science produces reliable knowledge. It means science will continue to be effective in bringing improvements for humankind. Indian demographic data strongly point to the increasing number of people and an increasing demand for food, fuel, fibre, pharmaceuticals, and progressively, demand for a cleaner environment. This indeed a need of biology education in science to be study for society which would be an applied one. Biology's contributions can be achieved through well planned and executed educational programs in schools and in adult populations, and focused as bioentrepreneurship.

Keywords: Biology science, improvements for humankind, bioentrepreneurship.

INTRODUCTION

Jawaharlal Nehru (Independent India's first Prime Minister) said that "It is science alone that can solve the problems of hunger and poverty, of insanitation and illiteracy, of superstition and deadening of custom and tradition, of vast resources running to waste, or a rich country inhabited by starving poor. Who indeed could afford to ignore science today? At every turn we have to seek its aid. The future belongs to science and those who make friends with science" (Radhakrishna, 2009).

Understanding biology and its complex processes is key to understand nature and its creativity. The knowledge thus obtained helps one to gain better insights about diverse organisms at different levels. Such studies help address questions on evolution, co-existence, survival, defence, growth, resistance and pathophysiology. To achieve this objective, the discipline requires a coherent involvement of researchers and academicians from other disciplines of science and humanities to accordingly shape its endeavour. Biological sciences have advanced rapidly during the last decades. This new century has made us more conscious than ever before of the social, economic, and environmental challenges that man faces in an increasingly urbanised, but ecologically interconnected global environment. Biological knowledge, as we all know, is intrinsically related to building a sustainable relationship between nature and human society. Hence the role of biology education needs to be rethought to respond to life in this century. The theme of the conference- Rethinking Biology Education for Social and Sustainable Development- was indeed timely and relevant for biologists and biology educators to discuss responsible and

responsive roles for practitioners and researchers in biology education.

Modern biological research came into being much later in India. Until the 1960s, biological research was largely directed toward pragmatic applications in agriculture, nutrition, and public health. Appropriate education is key to ensuring that biology provides the knowledge base to support entrepreneurship. Biology has been singled out due to the primacy placed on this discipline in its potential to affect humankind in the 21st Century. Indeed, the 21st Century has been touted as the "Biology Century" (Woese, 2004). However, biology education has to be viewed in the broader context of science education, and in particular, science education for development. In this broader context, science (biology) education must be considered for creating science literacy in adult populations and not just in schools. The UNESCO's "Science for All" initiative of the 1980s was primarily aimed at science literacy at the school level and not that of the public (Fensham & Harlen, 1999). In a contemporary context, this is not sufficient as science and its concomitant technology have become such an integral part of our lives that generalized science literacy is needed to form a basis for society to make informed decisions. In Figure 2, the schematic shows the three general goals of science education along the slope. Science education in schools involves pedagogy which stimulates enquiry and yet conveys the right degree of core knowledge and has economic goals associated with it. In Singapore, one of the Government's thrusts has been in the life sciences and biotechnology applications. Biology curricula were revamped in the early 2000's to focus on these as a basis for developing human resources (scientists and technologists) required to sustain a life science industry. At the National Institute of Education, the Ministry of Education provided financial support to develop a "DNA Centre" as part of the effort to train a cadre of teachers capable of driving the Life Science thrust. At the same time, the Singapore Science Centre (www.science.edu.sg) was tasked with public education and it in turn mounted exhibits and "hands-on" workshops on various aspects of genomics, molecular biology and biotechnology in an attempt to educate the general public towards greater "modern biology" literacy.

Conceptually, science education at the school level requires pedagogy skills while science education for the general adult public requires a sound understanding of andragogy. This is particularly the case when the situation is extrapolated to poor rural communities in developing countries, where sustainable development is so much more needed than in urban, rich communities. It is argued here that the andragogy must further recognize that language and mathematics literacy is often low in rural communities, and that to derive benefits from increased science literacy, it is further necessary to link that to entrepreneurship skills so that there are tangible outcomes which improve the livelihood of the poor.

Importances of Biology

According to Nurse Paul (2006), If science is taught as just an assemblage of facts without dealing with the process which gave rise to those facts, then why should pupils trust science more than fables or pseudoscience? Everyone leaving school should know the difference between

astronomy and astrology by knowing how science is carried out. Ensuring that everyone, not only those that go on to pursue science as a career, understands how science produces reliable knowledge, means science will continue to be effective in bringing improvements for humankind. Not only through those who go on to do science, but also because the skills developed by doing science ones that the innovators, problem solvers and leaders of tomorrow will also need. Science is also influenced by the way scientists behave and interact with each other in a community. An effective scientific community should be interactive and collaborative, and encourage the constant challenge of data, ideas and hypotheses. It is the overall strength of the evidence and argument that matter in science, not the hierarchical authority of the scientists involved. The combination of these attributes and ways of working produces a methodology that underpins science and which is very effective at generating reliable knowledge of the natural world and ourselves. It is a process in which we can have great trust. Science educators have a key role in imparting this understanding of what science is and how meet the needs for more fuel, fiber and animal feed.

it should be done. They must ensure students appreciate the process of science and the rigour which is required to produce reliable knowledge as well as the wider context within which science sits. The "Journal of Biological Education" can help educators instil in the next generation of citizens an understanding, appreciation and healthy scepticism about what science can achieve. Not only to produce excellent scientists, some of whom may go on to be Fellows of the Royal Society, but also to produce engaged citizens who use their knowledge of science to advance society.

Hypothesis

The 21st Century has been called a "Biology" century because of the many advances in humankind's understanding of the basic processes and components of life (Kim and Diong, 2012). At the same time that exciting discoveries and applications based on biology have been made, the lingering problems of hunger and poverty among almost a quarter of humankind still remain. Profound challenges face the world even as we advance technologically. Biology offers great scope to meet these challenges, especially in the assurance of food security, and in the use of biology to

METHODS & PROCEDURE

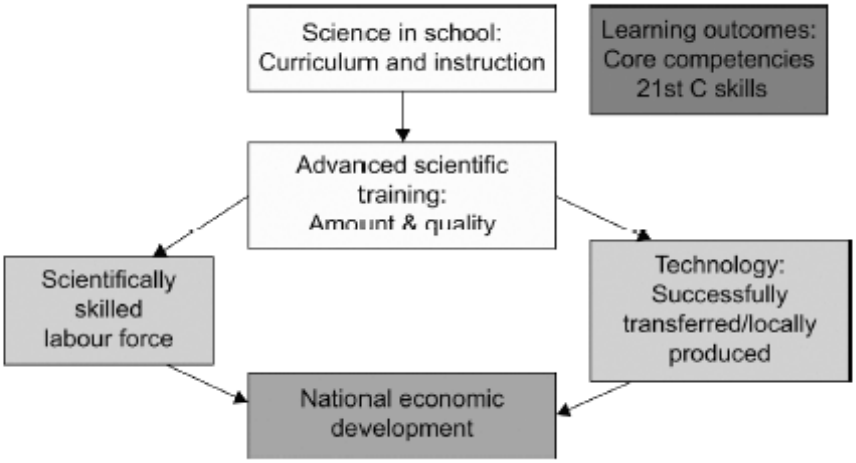

Figure 1 "Science for Development" model, schematically represented in (Drori *et al*., 2003).

DISCUSSION

Education promotes economic growth, national productivity and innovation is generally accepted by the development community. So too is education's role to promote the values of democracy and social cohesion. An educated and science skilled workforce is one of the pillars of the knowledge-based economy. Increasingly, comparative advantages among nations come less from natural resources or cheap labour and more from technical innovations and the competitive use of knowledge. Studies also link education to economic growth: education contributes to improved productivity which in theory should lead to higher income and improved economic performance. Countries with higher primary schooling and a smaller gap between rates of boys' and girls' schooling tend to enjoy greater democracy. Democratic political institutions (such as power-sharing and clean elections) are more likely to exist in countries with higher literacy rates and education levels. Education, especially adult education, can further enhance natural resource management and national capacity for disaster prevention and adoption of new, environmentally friendly technologies.

Conclusion and Implications of the Study

Indian demographic data strongly point to the increasing number of people and an increasing demand for food, fuel, fibre, pharmaceuticals, and progressively, demand for a cleaner environment. By 2025, there will likely be more than five billion people in Asia, characterized by an increasingly affluent but older population, most of whom will live in mega-cities with over ten million people each (Kim and Diong, 2012). Many of Asia's poor people, however, will still live in the countryside. The area of arable land for agriculture is expected to decline slightly compared to 2007, while sources of freshwater are also anticipated to decline. All these poses tremendous challenges in the coming years to produce more with less land, less water, less chemical and less labour. But it provides opportunities of high potential for

bioscience entrepreneurship. The biosciences, and particularly biotechnology, offer great promise to meet these challenges in this new millennium. It is hoped that the discussion in preceding sections has shown that biology is a pivotal knowledge component to meeting humankind's requirements and thereby contributing to sustainable development. Biology's contributions can only be achieved through well planned and executed educational programs in schools and in adult populations, and focused as bioentrepreneurship. The Indian region is uniquely placed to become the global leader in exploiting bioscience entrepreneurship to meet its needs. As physical and human capacity improves, more discoveries will fuel more innovative applications while the current deep R & D pipeline in many countries will translate into actual products and processes. By 2025, Asia will likely be a leading player in the "Biology Century".

REFERENCES

Fensham, Peter J. & Harlen, Wynne (1999) School science and public understanding of science. *International Journal of Science Education, 21*(7): 755–763.

Kim M. and C. H. Diong(2012). Biology Education for Social and Sustainable Development. Sense Publishers, Taipei. Pp.405.

Nurse Paul (2006). The Importance of Biology Education. *Journal of Biological Education*, 50 (1): 7-9.

Radhakrishna B. P. (2009). B. P. Nehru's 'The Discovery of India'. *Jour.Geol.Soc.India*, 73: 157-164.

Woese, Carl R. (2004). A New Biology for a New Century. Microbiology and Molecular Biology Reviews, Vol. 68(2): 173–186.

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REACH COMPLIANCE: INDIAN SCENARIO

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ABSTRACT:
Chemical Industry is an integral part of the Indian economy. Indian scenario is such that chemical companies mainly catering to local market are governed by a couple of local legislations which are not stringent enough. In India, to protect human health and the environment from the hazards posed by chemicals there is a need for a tough and inflexible chemical regulation. In European Union, REACH regulation focuses on ensuring the safe use of chemicals and phasing-out of hazardous chemicals. There is currently no REACH like regulation for chemicals in India. To remain competitive in the global economy, several governments world over have taken steps to align their national chemical regulations with REACH. The present global landscape for chemical industries is such that not only we should have a REACH-style stringent chemical legislation in India but also be REACH compliance.

KEY WORDS: chemical industries, chemical safety, REACH compliance

INTRODUCTION:

Life in a society that relies extensively on chemicals for a luxurious and comfortable lifestyle. Everyday comforts have multiplied the demands made on numerous chemicals consequently the global chemical production has also multiplied. With globalization the geographical scope of operation of chemical industries have increased manifold. The present scenario indicates that the growth in chemical production is fastest in developing countries as the chemical industry is rapidly shifting production to developing countries. With lower production cost and dismal chemical regulation acts in developing countries, the ever growing demand is partly fulfilled by developing countries and India is emerging as one of the focused destinations of chemical industries worldwide. The Indian chemical industry is ancient and it mainly comprises of small and large scale units in organized and un-organized sector. It is the third largest in Asia in terms of volume of chemical production. However, Indian scenario is such that, companies catering to local market are governed by several local legislations which are not stringent enough. There is no national chemical inventory or any chemical registration requirement either. In India there are two chemical regulations in force (i) Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 1989, 1994, 2000 (ii) Ozone Depleting Substance (R&C) Rules (2000). In July 2011, the Ministry of Environment and Forests published a draft document called Hazardous Substances (Classification, Packaging and Labelling) Rules, 2011.

There is a growing interest among investors in understanding the existing or future chemical regulatory landscape in India. Globalization has opened up the Indian chemical industries to a host of untapped opportunities. This has happened with the opening of Indian market to Foreign Institutional investors (FII) and Foreign Direct Investments (FDI). However, there is a rising global awareness that while there are several chemicals that contribute to human comforts, there are also chemicals that not only damage the environment but are possibly dangerous to human health. It is thus the responsibility of chemical industries to focus on environmental, economic and social sustainability. The Indian chemical sector trajectory shows growth since independence. For a sustainable future India has recently adopted

RoHS and WEEE regulation (June 2011). RoHS (Restriction of Hazardous Substances) enacted previously in the European Union, Japan, China, Korea and California. WEEE (Waste Electrical and Electronic Equipment) enacted in the EU, Korea, 25 US states, five Canadian provinces and India with its new legislation known as the E-waste (Management and Handling) Rules 2011 is now on the list. However it still shows reluctance to comply with stringent regulations such as REACH. Several countries have adopted or are in the process of adopting REACH regulation however in India, we feel that developing countries need to be treated differently before participating in international chemical treaties.

REACH:

REACH is the Registration, Evaluation, Authorization and Restriction of Chemicals. REACH is a regulation of the European Union and world's most extensive attempt to improve the safe use of chemicals. It requires the registration and submission of toxicity data for all chemicals sold in the EU in quantities more than one ton per year by 2018 (Gilbert, 2009). REACH Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 is commonly referred to as REACH. REACH compliance is mandatory for products manufactured in or imported into the European Union (EU).

REACH is based on the idea that industry itself is best placed to ensure that the chemicals it manufactures and puts on the market in the EU do not adversely affect human health or the environment. REACH places the burden of proof on companies. Industries should ensure that the chemicals it manufactures and which reaches the market in the EU are not hazardous to human health or the environment. There are two types of chemical – existing and new. REACH disallows the distinction between existing and new chemical. It is the strictest law regarding chemical substances.

REGISTRATION: Under REACH a manufacturer or an importer of a substance has a duty to register with the European chemical agency (ECHA), each substance manufactured or imported in quantities of one ton or more per year. Registration applies to substances on their own, substances in mixtures and certain cases of substances in articles. Registration is based on "one substance, one registration" principle. For registration the industry should submit detailed information regarding their product to ECHA through a registration dossier. Registration and data sharing is done to establish transparent, predictable and balanced framework within which the industry exercises the responsibility for the safety of their product. The hazard assessment includes identification and assessment of the physicochemical hazards, human health and environmental risks of a substance. Relevant documents are submitted to European Chemical Agency for inclusion in the classification and labelling inventory. Information on hazards and risks and how to manage substance safely is passed down and up the supply chain.

CONCERNS:

Apart from the potential costs to industry REACH compliance has attracted concern because animal tests on vertebrates are allowed only once per one substance. REACH promotes sharing of data and encourages the use of alternative methods for hazard assessment of substances. If a company pays for these tests, it sells the results for a price. Thus there are concerns that data sharing may prove to be a costly proposition. An opinion in Nature in 2009 by Thomas Hartung and Constanza Rovida estimated that 54 million vertebrate animals would be used under REACH and that the costs would amount to €9.5 billion. The quantitative studies that have analyzed the impact of green management on financial performance show that the positive impact of environment on financial performance is obtained are predominant (José F. Molina-Azorín, et al., 2009). Porter and van der Linde

(1995) argued that properly designed environmental standards can trigger new innovations which may partially or fully offset the cost of complying with them. Such "innovation offsets" can not only lower the net cost of meeting environmental regulations but also lead to an absolute advantage. ECHA contributes to the development of alternative methods and approaches and promotes their use.

CLASSIFICATION AND LABELLING:

Companies now have to classify, label and package hazardous chemicals (substances and mixtures) in accordance with the CLP legislation before placing them in market.

EVALUATION:

ECHA and the member of states evaluate the information submitted by companies. Evaluation under REACH focuses on examination of testing proposals, compliance check of the dossiers and substance evaluation. The Agency coordinates substance evaluation by the authorities to investigate chemicals with perceived risks. This assessment may be used later to prepare proposals for restrictions or authorization. Restriction is placed for the manufacture, marketing and use of certain substances, where there is unacceptable risk. Authorization is required for the use of chemicals which accumulate in our bodies or in the environment or cause cancer, mutation, problems with reproduction. The aim of authorization is progressive substitution that is the replacement of dangerous chemicals with safer alternatives.

INDIAN SCENARIO:

The strength of Indian chemical industries is the capacity to produce quality chemicals and world-class end products. It has a good R&D base and quality human resources. It also has a large domestic market and a strong presence in the export market. However the key concern is that the Indian chemical industries have high input costs for raw materials, power, fuel etc. and lacks world class infrastructure. To achieve global standards the industry needs to focus on exports and put efforts in critical areas so as to adopt aggressive growth. There is substantial export of Indian chemical products to EU countries and the industry needs to ensure that exports to EU countries are not hampered due to REACH. REACH is a regulation of the European Union. The responsibility for fulfilling the requirements of REACH lies with the importers established in the European Union, or the only representative of a non-EU manufacturer. Importers in the EU however turn to their non-EU suppliers and request information that they need to fulfil their regulatory obligations. REACH impacts on a wide range of companies across many sectors. Thus government and chemical industries should jointly take steps to ensure REACH compliance.

REACH is quite complex and sometimes incomprehensible to non-EU companies. The responsibility for fulfilling the requirements of REACH, such as registration or labelling lies with the importers established in the EU or the 'only representative' of a non-EU manufacturer established in the EU. Indian companies as non-EU manufacturer have to fulfil several obligations. Indian manufactures see REACH as a barrier, as it presents various challenges and involves substantial expenses. REACH regulates chemicals, chemical preparations and also the products containing or using chemicals. It affects manufacturers, retailers, importers, exporters, distributors and the users. The high costs involved make it less cost competitive to act on the EU market. Registration is based on "one substance, one registration" principle. Indian manufacturers have to generate data for any chemical used in the product. Registration and data sharing is done to establish the safety of the product. Thus substantial administrative requirement needs to be fulfilled.

All non-EU manufacturers importing substances into the EU above one ton a year, needs to register with ECHA. Non-EU importer can register or pre-register but it is tedious and of less advantage. Non-EU manufacturers can

register through an EU-based 'only representative'. A REACH 'only representative' is a legal entity established in the EU, nominated by natural or legal persons that manufacture substances, formulate preparations or produce articles outside the EU. The 'only representative' takes on the responsibilities and is liable for fulfilling the obligations of importers under REACH. Cost escalates as cost is involved in preparing and maintaining the technical dossier, registering the product through the only representative and cost of testing. This may have serious consequence for the small and medium sized enterprises. The requirement to share information about the substances manufactured, imported, placed on the market and used in the EU is a fundamental aspect of REACH. Companies all over have apprehensions regarding sharing trade information. There are also anxieties regarding potential discrimination of non-EU manufacturers and exporters of chemicals. On 8 June 2006, the REACH proposal was criticized by non-EU countries, including the United States, India and Brazil, which stated that the bill would hamper global trade (Beunderman, 2006).

India witnessed several chemical related accidents that took place sporadically. Therefore, a robust chemical management regulation is needed. It will be advantageous for the Indian industry to comply with one regulation rather than many. There is a growing awareness towards health, safety and environment. The global trend for stringent chemical regulation has made Indian manufacturers REACH-prepared. The chemical sector, which is knowledge and capital intensive, is the mainstay of industrial and agricultural development and are thus vital to India's developing and agrarian economy. The industry will need to recognize paradigm shifts in technology and markets that will have consequences for Indian companies (Raghavan, 2016).

India published a Draft National Chemical Policy that consolidates the multiple legislations in India into one law. The new policy aims for the safe use of chemicals, protection of human health and environment as it align our national chemical regulations with REACH.

CONCLUSION:

Indian chemical industry is one of the oldest but India does not have a national chemical inventory. The chemical industry in India is governed by multiple legislations under several ministries. Cheap labour, raw materials availability, technology compliance and huge consumer markets makes India a strong manufacturing base. With a huge foreign market, the Indian chemical industry trajectory shows tremendous export and growth potentials. There is substantial export of Indian chemical products to EU countries and the industry needs to ensure that exports to EU countries are not hampered due to REACH. REACH is a regulation of the European Union. REACH includes occupational and environmental safety, health and process safety management. India still shows reluctance to comply with stringent regulations such as REACH. To address the global competitiveness we should have a REACH-style stringent chemical legislation in India and also be REACH compliance.

REFERENCES

1. Beunderman, M. (2006). 'EU chemical bill under fire from US-led coalition". EUobserver.com.
2. Gilbert, N. (2009). Chemical-safety costs uncertain. Nature 460, 1065.
3. Hartung, T. and Rovida, C. (2009). Chemical regulators have overreached. Opinion in Nature, vol. 460, 27 August 2009.
4. Hazardous Substances (Classification, Packaging and Labelling) Rules, 2011.
5. José F. Molina-Azorín, Enrique Claver-Cortés, Maria D. López-Gamero, Juan J. Tarí, (2009) "Green management and

financial performance: a literature review", Management Decision, Vol. 47 Iss: 7, pp.1080 – 1100.
6. Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 1989, 1994, 2000
7. Ozone Depleting Substance (R&C) Rules (2000).
8. Porter, M. and C. van der Linde. (1995). "Towards a new conception of the environment competitiveness relationship." Journal of Economic Perspectives. Vol. 9, 97-118.
9. Raghavan, R., (2016). "Achieving 3X Growth in the Indian Chemical Industry: What Will It Take?" *Chemical Weekly*, pp. 135–136.
10. Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing a European Chemicals Agency.

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BIOTECHNOLOGICAL ADVANCEMENTS FROM BIOETHICAL PERSPECTIVE

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ABSTRACT:

Biotechnology is the powerful tool which proved to be a boon to mankind. In ancient time, it began with use of simple fermentation processes which were carried out for household purposes. It gifted several food products as well as medicinal compounds after industrial revolution. Later the inventions of the advanced technologies like recombinant DNA, cloning and tissue culture boosted up the scope of biotechnology in various fields such as agriculture practices, environment management, medical treatments, bioinformatics, etc. Just like any other invention, biotechnological inventions can be used in positive as well as in negative way. In recent years, biotechnology gave birth to various controversies and disputes with respect to usage of techniques. Through current article certain bioethical aspects of biotechnology had been elaborated with their impacts on human society. At the end, possible strategies to avoid unethical use of these techniques had been discussed.

Keywords: Genetic engineering, Bioethics, Genetically modified organisms, clinical trials, amniocentesis, i*n- vitro* fertilization.

INTRODUCTION

Biotechnology is the science of 21st century and appropriately defined as, *"The development and utilization of biological processes, forms, and systems for obtaining maximum benefits to the man and other forms of life."* [1] Biotechnology can also be considered as novel value added version of ancient science. It has roots in period of origin of human civilization. There are two main phases in the development of Biotechnology, viz., traditional phase and modern phase.

The traditional biotechnology refers to the use of 'fermentation' – a microbial process which was used in preparation of food, e.g. the Aryans (5000 to 7000 B.C) made use of *Ghee* which has condensed milk fats, the Babylonians (6000 B.C.) and the Egyptians (2000 B.C.) used to prepare beer and vinegar from grains and crushed dates respectively.

[2] It is evident that in ancient period traditional biotechnology was mainly restricted to the art of cooking and beverage preparation.

By the end of the 19th century, the traditional Biotechnology paved its way to the industrial production of beer, whisky, wine, rum, canned food, etc. Later modern biotechnology has made remarkable discoveries such as restriction enzymes, r-DNA technology (genetic engineering), cloning, genetic testing, bioremediation, biofuels, pharmcogenomics, bioinformatics, etc. Undoubtedly, these inventions benefited mankind in several ways but every coin has two sides and similarly, every technology has its uses and misuses depending upon its impacts.

In recent years, biotechnology inventions related with plant breeding, animal husbandry and human healthcare have raised many ethical issues. 'Ethics' are moral principles stated by every religion, which define a code of conduct for a person. They define the way one should live his/ her life. [3] The code of conduct may vary with respect to time, context and impact on society. Bioethics is ethics related to the implications of the biological research and healthcare. 'Medical ethics' is a system of moral principles that apply values and judgments to the practice of medicine. They comprise of four basic principles such as autonomy, justice, beneficence and non-malefience. They all are directing ethical code of conduct in medical treatments. [3] In recent years, manipulation in the genetic setup of different organisms has created a chaos in the environment. It has raised different ethical issues and concerns for safety of human health. In further section, some of the utmost important ethical as well as safety issues are discussed with case studies.

Genetically Modified Food - The genetically modified (GM) foods are prepared by insertion of foreign genes in plants or animals. Here the issue is that there are certain religious groups of people who do not consume particular animals like for e.g. Hindus don't eat beef (cow), the Muslims don't consume the pig meat. When they will consume the GM food containing the genes of those animals, it will hurt their religious sentiments. Consumption of the genetically modified organisms (GMOs) like goats, sheep, etc having the human transgenes (e.g. blood factor XI gene) or food animals having the presence of some human biological part, will be like eating the human flesh. The human genes transferred into the organisms that are used as the animal feed is unethical. For example yeast that has been modified to produce the human protein is used as the animal feed. Due to the random gene transfer the risk of gene pollution has also increased. [4,5,6] *Therefore it is required that each* GM food must be tested on a case-by-case basis before introduction. [7,8,9] The legal and regulatory status of GM foods varies by country, with some nations banning or restricting them, and others permitting them with widely differing degrees of regulation.[10,11,12,13] As far as India is concerned, GM cotton is the only genetically modified crop which is

cultivated on more thane 10% field area. But in India labelling of imported GM food is not mandatory.[14,15] They are usually sold in market unlabelled and thus, the consumers do not know the status of the food they are buying. These practices may evoke concern about ethical and safety issues.

Patenting of living organisms - The Patent Act was originally issued to protect "any art, machine or material that is new and useful." Until some decades ago, the thought of patenting a living organism was inconceivable. However, when a patent for a bacterium with the capacity to decompose petroleum was requested, a new era of patenting began. In 1988, Harvard University received the first patent for a transgenic animal, a mouse with a human gene for cancer. That animal was called an 'oncomouse'. It has great usefulness in development of anticarcinogenic drugs. It has been strongly argued that patenting of human genes is ethically unacceptable.

Life is created by God. We believe that all the creatures, big or small are his children, his creations. Thus the question is how can any human have a patent for some organism that is merely the creation of God? Does one become the patent holder of certain species just by manipulating its genes? This issue is a topic of debate all over the world. However very importantly patenting of the living GMOs is accepted by countries like USA, Japan, UK etc. [16, 17]

The 2014 Indian Patent Office (IPO) annual report stated that among 43,000 patent applications, 2,300 were related to biotechnology. In India plants and animals, biological processes of production of them are unpatentable. However genetically modified micro-organisms and vaccines are patentable, subject to other requirements. [18]

***In- vitro* fertilization technology** - *In vitro* fertilization (IVF) is a process by which an egg is fertilized by sperm outside the body (*in vitro*). The ova and sperms obtained from donors. The fertilized egg is transferred to the mother or the surrogate mother's uterus artificially to establish a pregnancy. The foster mother who has the embryo growing in her womb just acts as a bio-incubator. After the child birth she is not supposed to keep the child with her. Isn't separating a mother from her child, against our ethics? The qualifications of the surrogate mother are nothing but poor, illiterate, in need of money, etc. although they are married and have children, they are forced by their own husbands to go for surrogacy. They have to live in isolation from their family and children during the period of pregnancy. And all this is just for a few lakhs of rupees. [19]

In the IVF technology, the embryos that are developed are not single in number. The unutilized embryos are thrown away or killed. If not this then they are implanted in the surrogate mothers for the commercial purpose. The embryonic stem cells which are of great importance in the medical technology are obtained from the embryos. For this purpose the embryos are killed and sometimes even aborted. The children born by the help of IVF technology also have to face many social and religious problems. Like for e.g. the Catholic Church doesn't approve the IVF technology. This is because it proclaims that the conception of foetus should never take place outside the body. The Muslim countries like Malaysia believe

that sperm donation is immoral. [1, 20] Recently HIV resistant human babies had been produced in China using CRISPR/Cas9 edition and IVF technology. It had also invited a lot of controversies among the scientist community. [21] It still remains a question that, will a child born like this get an equal status as that of the normal born children? It may happen so that the child will never know its biological parent!

Amniocentesis - The technique of amniocentesis is used for the study of development of the foetus and to detect the abnormalities in it. With the help of this test it is possible to detect the sex of the child. [22] In India it was believed that only a male child can bring prosperity to the family. The sex determination was done by amniocentesis and if it was found to be a female foetus it aborted with or without the wish of the mother. The fetuses then aborted were thrashed like any other waste.

Clinical trials Every new drug before reaching the market has to undergo strict testing on animals and humans. These drug trials are known as preclinical and clinical trials. In India, there is a certain set of rules that are laid down by CPCSEA (Committee for the Purpose of Control and Supervision of Experiments on Animals) for conducting these trials. The companies found it difficult to get the volunteers for the trials as the literates know the risks and side effects of such tests. Hence they have turned towards the poor and underdeveloped countries of Asia and Africa. Even in India the exploitation of the poor and vulnerable group of people has become a common sight. In Andhra Pradesh and Gujarat, Program for Appropriate Technology and Health (PATH), an NGO performed unethical trial of HPV (Human papilloma virus) vaccine on nearly 23,500 girls in the age groups of 10-14 yrs without their consent. The trial came under scrutiny when the death of 7 girls who were vaccinated was reported. [23] In 2003, over about 400 women who were trying to conceive were given the trail of Letrozole (the drug tested for inducing ovulation) without their consent. This was done by Mumbai based Sun Pharmaceutical Industries Ltd. They got the private doctors to prescribe the drug to the women. [24, 25,27]

CONCLUSION

In running the race of development, mankind seems to have left the valuable morals and humanity far behind them. It is truly said by Alan M. Eddison that, *"Modern Technology, owes an apology to the ecology"*. We have invented the technology to upgrade our standard of living but have not yet learned to use it without creating new threats to life. The modern Biotechnology is the key that we humans have to unlock the door of the future. But the path (ethical/ unethical) used for approaching it, is yet to be determined. The technology should bind to our ethics and should bend to our morals. This must not be the other way round.

It is advisable to use powerful tools of biotechnological techniques for enhanced food and effective medicines production. The labeling of the GM food (vegetarian and non- vegetarian) should be done compulsory. This will help in maintaining the transparency in between the manufacturer and the consumer. The random gene transfer should be done only and only if necessary and keeping in mind its future effects on the environment.

For correcting complicated human diseases, animals should be use for organ production like kidney, liver, etc. But the transplantations should be done only with the consent of the patient. Even though human subjects are used in clinical trials, they should be well informed about the side effects of drug treatment. The sex determination of the foetus is actually a punishable offence. This problem requires dual approach, 1st to create awareness of gender equality in the society and 2nd strict legal action against doctors.

The human cloning is a far different issue than the animal or plant cloning. It may raise many religious, ethical and moral issues. It is an area which is good to remain unexplored.

The commercialization of scientific knowledge has itself degraded its value. The people in the so called modern world are becoming more materialistic. The greed for the obtaining money has blind-folded them. The quote of Albert Einstein, "*It has become appallingly obvious that our technology has exceeded our humanity*" is truly applicable to the contemporary world of biotechnology. In conclusion, the entire human community has to shoulder the responsibility of ethically convincing and safe use of biotechnology.

REFERENCES:

R.C Dubey (2006). A textbook of Biotechnology, 4th revised and enlarged edition, S. Chand Publication, pp 3, 9, 265.

Arnold JP (2005). Origin and History of Beer and Brewing: From Prehistoric Times to the Beginning of Brewing Science and Technology. *Cleveland, Ohio: Beer Books*. p. 34.

Internet Encyclopedia of Philosophy. / retrieved on November 22, 2018, A peer reviewed academic resource, Website https://www.iep.utm.edu/ethics. Retrieved on 28 August 2016.

Scott SE, Inbar Y, Rozin P (May 2016). "Evidence for Absolute Moral Opposition to Genetically Modified Food in the United States" (PDF).

Crawley MJ, Brown SL, Halis RS, Kohn D, Rees M (2001). Biotechnology: Transgenic crops in natural habitats. *Nature.* **409(6821)**: 682-683

"Restrictions on Genetically Modified Organisms". *Library of Congress. June 9, 2015*. Retrieved February 24, 2016. https://www.loc.gov/law/help/restrictions-on-gmos/

"Frequently asked questions on genetically modified foods". *World Health Organization*. Retrieved February 8, 2016. https://www.who.int/foodsafety/areas_work/food-technology/faq-genetically-modified-food/en/

Haslberger AG (July 2003). "Codex guidelines for GM foods include the analysis of unintended effects". *Nature Biotechnology*. **21** (7): 739–41.

"Genetically modified foods and health: a second interim statement" (PDF). British Medical Association. March 2004. Retrieved March 21, 2016 http://www.argenbio.org/adc/uploads/pdf/bma.pdf

Bashshur R *(February 2013).*"Restrictions on Genetically Modified Organisms".

Library of Congress. Retrieved February 24, 2016. http://www.loc.gov./law/help/restrictions-*on-gmo*

Sifferlin A (October 3, 2015). "FDA and Regulation of GMOs". *American Bar Association*. Retrieved February 24, 2016. http://www.americanbar.org/content/newsletter/publication

Lynch D, Vogel D (April 5, 2001). "Over Half of E.U. Countries Are Opting Out of GMOs". http://time.com/4060476/eu-gmo-crops-european-union-opt-out/

"The Regulation of GMOs in Europe and the United States: A Case-Study of Contemporary European Regulatory Politics". *Council on Foreign Relations*. Retrieved February 24, 2016. https://www.cfr.org/report/regulation-gmos-europe-and-united-states

James C (2011). "ISAAA Brief 43, Global Status of Commercialized Biotech/GM Crops: 2011". ISAAA Briefs. Ithaca, New York: International Service for the Acquisition of Agri-biotech Applications (ISAAA). Retrieved June 2, 2012. http://www.isaaa.org/resources/publications/briefs/43/executivesummary/default.asp

Gaskell G, Bauer MW, Durant J, Allum NC (1999). "World Apart? The reception of genetically modified foods in Europe and the U.S." *Science.* **285(5426)**: 384-7

Dresser R. (1998). Ethical and Legal Issues in patenting New Animal Life. *Jurimetrices.* **28**: 399-435.

Marchant GE. (2007). Genomics, Ethics and Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices. Ch.1.5: 29-38.

Patenting in biotechnology – the Indian scenario Retrieved February 24, 2016. https://www.iam-media.com/patenting-biotechnology-indian-scenario.

Pande, A. (August 29, 2016). Surrogates are workers, not wombs. Retrieved August 29, 2016 https://www.thehindu.com/opinion/op-ed/Surrogates-are-workers-not-wombs/article14594820.ece

Pope Benedict XVI Declares Embryos Developed For In Vitro Fertilization Have Right To Life", Medical news today, archived from the original on 29 December 2008 https://web.archive.org/web/20081229164506/http:/www.medicalnewstoday.com/articles/38686.php

Belluz J (January 22, 2019) Is the CRISPR baby controversy the start of a terrifying new chapter in gene editing? Retrieved on 4 December 2018 https://www.vox.com/science-and-health/2018/11/30/18119589/crispr-technology-he-jiankui

"Diagnostic Tests – Amniocentesis". Harvard Medical School. Archived from the original on 2008-05-16. Retrieved 15 July 2008 https://web.archive.org/web/20080516200040/http:/www.health.harvard.edu/diagnostic-tests/amniosentesis

A shockingly unethical trial (May 15, 2011) Retrieved on 25 August 2012. http://www.thehindu.com/opinion/editorial/article2021657.ec,

Melo AS, Ferriani RA, Navarro PA. (2015). Treatment of infertility in women with polycystic ovary syndrome: approach to clinical practice. *Clinics (Sao Paulo)*. **70(11)**:765-9.

Kar S. (2012).Clomiphene citrate or letrozole as first-line ovulation induction drug in infertile PCOS women: A prospective randomized trial. *J Hum Reprod Sci.* **5(3)**: 262–265.

Burke J. (November 12, 2014). "Indian women die after state-run mass sterilisation campaign goes wrong". http://www.theguardian.com/world/2014/12/India mass sterilization

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RECENT TRENDS IN SCIENCE EDUCATION IN INDIA: A REVIEW

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ABSTRACT

As emerging patterns of education and manpower growth are indicating a concept shift, an analysis of this trend will be appropriate for shaping the future of tomorrow and for taking the desired course of action. In the present study the emerging trend in higher education is analysed with the help of review of trends in science education. Scenario presented here may be useful in education reviews and can provide a base for S&T planning and policymaking. Remedial measures are necessary for rejuvenating the interest in science and for ensuring productivity. If evaluative conclusions are made at this level we can reasonably describe the situation needs immediate attention of the policy makers and the society, in general.

Keyword

Science, education, India

INTRODUCTION

Science Education share several commonalities in regards to the values, as well as several challenges. Scientific development in recent decades has, and will continue to have, a significant influence on topics that have great importance for humanity, quality of life, the sustainable development of the planet, and peaceful coexistence amongst peoples. From the immediate basic essentials of life such as access to water, food and shelter, to important issues that affect us all, all have a strong science component to which everybody should have access to take part in local, regional, national and transnational decisions in a meaningful way.

Current Scenario of Science Education

Schooling of a child in India usually starts at the age of 3-4. All states follow a uniform academic system i.e. the 10+2 system or higher secondary. The curricula are either developed by the respective state boards/councils or by the national boards like the Central Board of secondary education (CBSE) or by Council for the Indian School Certificate Examinations (CISCE). All curricula are not the same; however, the basic knowledge of Science, including Physics, Chemistry, Biology and Mathematics is compulsory for every student till 10th grade. After class 10th, a student may choose any of the available streams. In class 11th and 12th, those who take science, learn the basics of Applied Physics, Applied Chemistry, Plant and Animal Biology and/or Higher Math. After completion of Class 12, one can either take the conventional way i.e. do courses such as B.Sc and MSc or can opt for a professional career such as B.Tech and MBBS.

Looking at the quality and scope of Science education in India, the non uniformity in the system is quite visible. This may be due to various causes. One major cause is the socio-economic difference between rural and urban India. However, the state as well the union governments are in a constant endeavor to fill this gap up and to provide every citizen of the country quality as well as affordable education.

Higher education, particularly in science discipline is offered by universities and colleges located in various parts of the country. Majority of universities in India train a large number of graduate students. Due to issues like infrastructure, proper quality control of faculty, a majority of the students find it difficult to fine-tune themselves with the complexities of science education at this level. Weak understanding of the concepts results in Incompetence. The curriculum is robust in structure – but is very difficult in implementation. To overcome this situation, the government has been implementing various recommendations made by HRD Ministry and other organization like National Knowledge Commission. Similarly, research activities in Science discipline have not yet gained much distinction. The government has established several research centres all over the country for carrying out research activities in a particular field. Also, universities throughout the country have been assigned with various projects to perform research work.

In short, modern societies need people with scientific and technological qualifications at the highest level as well as a general public which has a broad understanding of the contents and methods of science and technology, coupled with an insight into their role as social forces that shape the future. Science and technology are major cultural products of human history, and all citizens, independently of their occupational 'needs', should be acquainted with them as elements of human culture. While science and technology are obviously important for economic well-being, they must also seen from the perspective of a broadly based *liberal education.*

Creating enthusiasm among students to learn science is the most widespread activity in India being carried out at present. The government is popularizing the discipline by means of popular science articles, organizing lectures, through various scholarship schemes and through the establishment of science centre's etc. Efforts in this direction have come from both individuals and from institutions. There are several organizations and institutions both public and private trying to change the scene of science education in India.

As the Indian society is reinventing itself, it is going through a massive change. To ensure sustainable growth, we need to move from service economy to knowledge economy. In this context, we are ushering a new education system in science and technology to bring Indian intelligentsia into knowledge production. Indian education system, like in many other spheres of our society, is at the cross-roads trying to find a way to enhance the number and quality of future academic as well as industrial researchers of the country, while still maintaining a socialist approach to educate large masses of relatively underprivileged people (Shashidhara, 2011).

According to the modern source of all knowledge, Wikipedia, education is the process by which society deliberately transmits its accumulated knowledge, skills and values from one generation to another. India is one of those rare civilizations, which had formal education since time immemorial. Indian education was founded with strong emphasis on logic and mathematics. British brought the Greco-Roman system of knowledge to India in early 19th century, which is the foundation for modern science. India quickly picked this up and many Indians significantly contributed to science and mathematics. When India became independent, in 1947, the literacy was as low as 12% and may be lower. Absolutely there was no scope of any foreign investment to a country that people like Winston Churchill thought would survive only for few weeks.

The need was to educate masses to build the nation and to build the infrastructure to stimulate further growth in the economy. The emphasis naturally was on technical education, which very quickly (50 years is very small time in the life of any nation, more so of one with a billion people) made India one of the largest economies in the world. Much of the new wealth is from providing services to the world. However, to ensure sustainable growth, we need to move from service-economy to knowledge economy.

While there is no doubt that there never had been better time than today in the recorded history to pursue science in India, the challenge is to secure the future. Planning for future is more challenging now than in 1950s. At that time, the options were limited due to scarcity of resources. Very small number of trained manpower was available to steer the country's education initiatives. Now, very large number of accomplished scientists and technocrats are available to pursue a number of options to meet the aspirations of the people. It may sound cliché. India is a country of enormous diversity. No single model of science education and research would cater to the needs and aspirations of the entire nation. Still, a consensus seems to have emerged on the need to integrate high quality research with undergraduate teaching to improve science education in India and to enhance the number and quality of future academic as well as industrial researchers in the country. By dedicating certain amount of time for teaching, faculty is also expected to improve the quality of their research.

Since the beginning of this century, several new initiatives are being explored such as,

(i)Establishment of large number of broad education centers: Central Universities, IISERs, NISER, IITs, NIPERs

(ii)Establishment of specialized centers of research and education in space technology, defense technology, translational research, biotechnology and stem cell biology

(iii) Expansion of existing institutes such as IITs, IISc and TIFR. The latter two would soon be initiating undergraduate education programs.

Only time will tell what would be the outcome of these initiatives. Most decisions in historical contexts would look either very good or bad, but at the time of making the decisions, we would be dabbling with only hypothetical situations. Any decision would be based on some logical thinking that suggests that a particular hypothetical scenario would be better than the other hypothetical one. Here, we could learn something from evolution. More the genetic diversity better the chances that a species survives and proliferates. This is because we could always find few individuals carrying genetic variants that would help them to adapt (better than their ancestral population) to a new environment. This is precisely what we need to do. Wiser the nation if it invests on a broad-based education system, which nurtures both curiosity and creativity amongst its citizens. Such education system would create amongst the people the skills and competence in diverse fields and thereby improves the overall preparedness of the country in the long run.

Irrespective of diversity in the opinion on what and how to research and teach, there is no argument that on the three conceptual foundations, on which any scientific enterprise should be built.

(i) Strong emphasis on basic science: When it comes to science, "no national scientific enterprise can be sustainable in the long term if it does not contain generous room for curiosity-driven research. While the technological outcomes and social benefits of basic science are almost always long-term and rarely predictable, such science creates and consolidates overall competence and

intellectual diversity" (from: http://insaindia.org/pdf/INSA_Vision_2010.pdf).

Objectives

To know the present status of science education in India. The general aim of science education is to help develop well-defined abilities in cognitive and affective domains, besides enhancing psychomotor skills. It helps to foster an uninhibited spirit of inquiry, characterized by creative, innovative and objective approaches. Educational programmes are designed to help unravel the mysteries of the inter-relationship between science and day-to-day life, health, agriculture, industry, and indeed, the individual and the universe. Scientific wisdom, knowledge and skills are ammunitions that instil confidence and inspire the individuals to challenge existing beliefs, prejudices and practices. They work as a liberating force and serve as a reliable tool in one's search for truth, harmony and order in different aspects of life.

RESULTS & DISCUSSION

The development of modern science in India is not an organic extension of the earlier tradition. It is an implant by the British in a language that was alien to its people. As with other implants, it needed nourishment and nurturing to be absorbed in the society. Science education was lacking and science was looked upon as an appendage thrust by the British for their own benefit. Until a few decades towards the end of the British rule, the role of science education, scientific and technological research in economic growth and social transformation was rather limited. Only such developments were introduced that did not lead to a conflict with the interests of the colonial power. The only aim of education including that of science education was to turn out men competent to serve the civilian administration. Consequently, science education and research was uneven and patchy with no facilities. Even those few individuals educated in science lacked opportunities for either gainful employment or for scientific research. They could only procure clerical or teaching jobs.

Scientific knowledge can be achieved by the cumulative experience of knowing how by doing it. In most case, it is achieved by participating in the practical research group. Research can therefore be seen as a way of learning. Universities have long abandoned the accent on research and have become mere teaching centres. Research aptitude in students is not properly developed during their course of study. Their curriculum is neither research oriented nor updated. For many reasons majority of teachers with doctoral degrees in science are unwilling to undertake research projects or collaborative research. India has a long flourishing tradition of education in pure and applied sciences. The country has nearly 49 million graduates and about a quarter of these have a background in science. India has a very vast structure of education and its higher education sector is now highly advanced, compared to its neighbouring countries. It consists of more than 338 universities like institutions and 17,625 colleges capable of producing the largest share of educated manpower in the world. Studies made at various levels (Garg and Gupta, 2000) have illustrated a paradigm shift away from science both at secondary and tertiary levels.

In the comprehensive report published by the National Council of Applied Economic Research (NCAER) reveals that less than three percent of school children want to pursue a carrier in science (Rajesh S., 2005). Students drift to other job-oriented courses after graduation in science is prevalent in India. The widespread impression among students is that unlike professional courses, a

career in basic science is not lucrative. In many campuses the teacher acts as information delivering agent who tends to promote memorization rather than conceptual understanding. The authoritarian nature of teaching-learning practice existing in universities turns students as respectable receptors of a pre-constituted knowledge package. The academic ambience persisting in many universities do not encourage the research pursuits of faculties. Research management in universities is another very serious problem faced by many Indian universities. Careful analysis is necessary for elucidating the reason for the decline and to find proper measures for strengthening science education and research. Addressing all the issues of these institutions in a country is a cumbersome task; however, there are many common problems that can be sorted out.

Conclusion and Implications of the Study

The data clearly show that the greater benefits that science brings are unequally distributed. Science teaching and research face a challenge in Indian universities. A major reason for this trend is that the career in science is not attractive like a profession in business administration or in politics. Teachers refuse to undertake research along with teaching and are resistant to major structural changes in the system unless it is beneficial to their career. Remedial measures are necessary for rejuvenating the interest in science and for ensuring productivity. If valuative conclusions are made at this level we can reasonably describe the situation needs immediate attention of the policy makers and the society, in general.

References

Shashidhara L S. (2011). Science education and research in 21st century India. Posted on Jun 16, in Teaching, Advice and Research.

Garg K. C. and Gupta B. M., 2003. Decline in Science Education in India- A case study at +2 and undergraduate level, *Current. Science*., Vol. 84, No. 9, pp. 1198–1201.

Rajesh Shukla., 2005. *India Science Report*, New Delhi, Indian National Council of Applied Economic Research.

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COMPARATIVE STUDY OF PHOTOTRANSISTOR (L14G1) FOR DIFFERENT COLOR FILTERS.

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Abstract

Phototransistors are ideal photodetectors and in the literature it has been discussed as radiation detectors for measurements in the low energy range. Phototransistors, the light-sensitive circuit elements generate electrical signals such as current, voltage, and resistance, depending on the amount of light they receive. Consequently Phototransistors are widely used in light measurement systems, light control systems, optocouplers and optoelectronic devices. The paper analyzed the electrical values produced by the application of increasing light sensitivity for different color filters likewhite, red, orange yellow green and blue on phototransistor. Values obtained, the 2456.868082 standard deviation shows that phototransistor has a better performance in terms of light sensitivity for green color filter compare to other color filters.

Key Words

Phototransistors, light sensitivity, Lux meter,color filters,LED Bulb (8V)

Introduction

The large diversity of applications in our daily lives that rely on photodetection technology requires photodetectors with distinct properties. The choice of an adequate photodetecting system depends on its application, where aspects such as spectral selectivity, speed and sensitivity play a critical role. An NPN phototransistor-type silicon radiation detector has been used for evaluating the X-ray beam dose in the diagnostic range.L. A. P. Santos (2006).

Ensuring uninterrupted supply of energy to support economic and commercial activities is essential for sustainable economic growth P.Balasubramaniam (2012).In addition to natural light, day-time light is essential for internal zones such as living areas, factories, offices and etc. Unfortunately it is a fact that,most of the times, the amount of energy consumed in these areas is more than needed. Ghassan et al. (2015) and Özçelik(2016).The world has suffered many energy shocks. India too has energy shortage. Most of these shocks have fallen under the definition of a human-made

energy crisis. The simplest solution to stretching the world's energy supply might be to turn off the light when leaving a room. Therefore controlling the light intensity and thus saving energy becomes vital.Juan et al. (2016), Toufiqetmal.(2016),Gentile et al.(2016).
Sensors such as phototransistors, photodiode, LDR (Light Dependent Resistor), optocouplers and photocells are utilized to measure and control light. Fathabadi (2016), Kamran et al. (2011), Lauet al. (2006), Özçelik (2016).Sensor sensitivity has significant role for light control and specifically for light measurement tools .Phama and Suhb (2017). The values generated by the sensors in line with the light intensity are input data of control systems like microcontrollers. Through a mathematical figuring, the data obtained generate an illumination information at the system's output or they help with the adjusting the lighting level of an illumination system. Thus, selecting and adopting these sensors to measure and control systems is crucial.

Phototransistor is in the group of photo-detectors, which are widely used in light measurement, control, and detection systems.In this study, phototransistor is covered in a closed environment or indoor area like dark room in laboratory. Characteristic curves are created from current values obtained by varying the light values on these sensors for different colour filters.
L14G1 is silicon phototransistor is, TO-18 package Hermetically sealed package with narrow reception angle. L14G1 is an NPN phototransistor**.** It acts as a photodetector in the sense that it can convert the incident light into electric response. They are commonly used as sensors usually paired with a light source like LED.It shows sensitivity to visible and close to infrared radiation. In fact, organic-based photoactive media combine effective light absorption in the region of the spectrum from ultraviolet to near-infrared with good photogeneration yield and low-temperature processability over large areas and on virtually every substrate, which might enable innovative optoelectronic systems to be targeted for instance in the field of imaging, optical communications or biomedical sensing. Baeq K.J et al (2013)

Experimental Setup

The experimental unit set up to measure the optical sensitivity of the phototransistor sensors will be investigated.

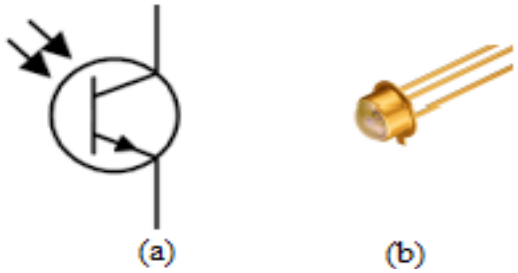
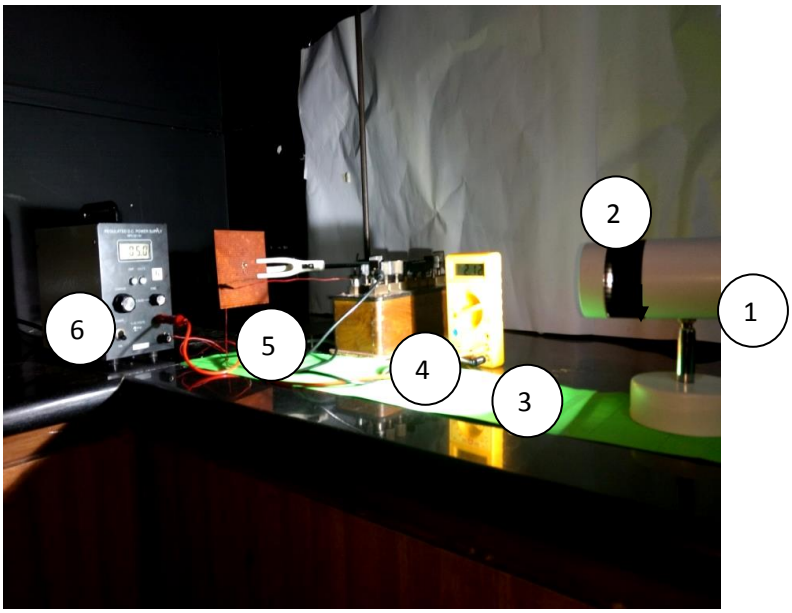


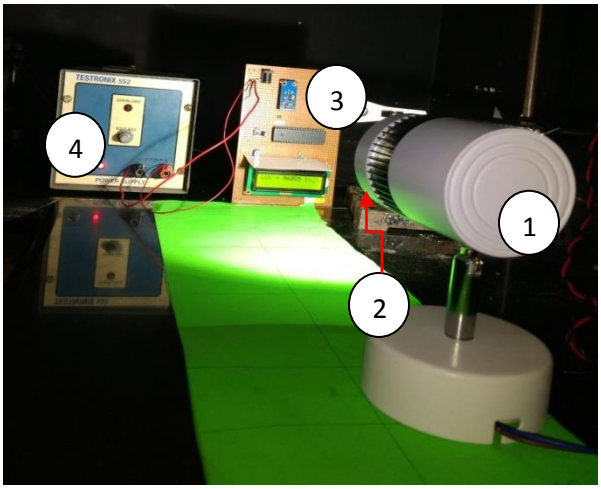
Figure 1 shows the picture and form (symbol) of the phototransistor.



1. LED Light Bulb
2. Colour Filter
3. Digital Multimeter
4. Resistance Box (500Ω)
5. Phototransistor L14G1
6. DC Power Supply (5volt)

Figure 2. The experimental setup for the Electrical parameter of Phototransistor.

The experimental setup used in this research included a 0-30 V Direct Current (D.C.) electrical supply, colour filters (52mm) white, red,orange, yellow, green, and blue, 500 Ω resistance, phototransistor sensor, multi-meter and for the indoor area lighting measurement lux meters circuit (lux metersBH1750 module, 16 bitAT89S52 microcontroller and16 pin LCD display with Max. range 65535 lux, Resolution 1 lux, Accuracy ±%20) have been used,



1. LED Bulb
2. Color Filter
3. Lux Meter Module
4. DC Power Supply (5 volt)

Figure 3. The experimental setup for measuring the Light intensity using Lux Meter

RESULTS AND DISCUSSION

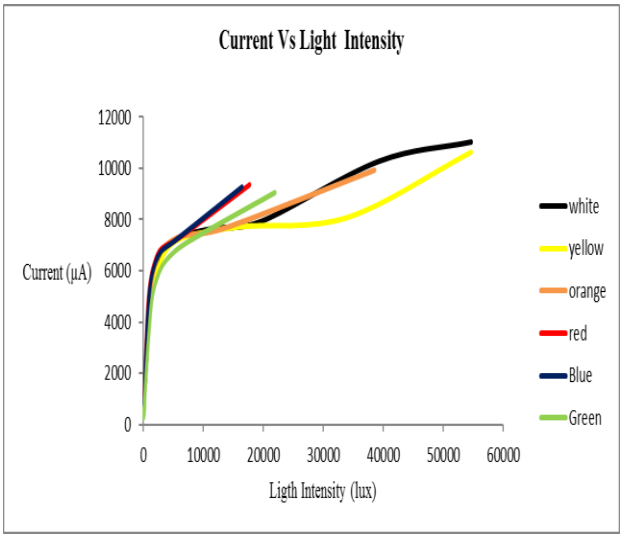


Figure 4 realization of current V/s light intensity

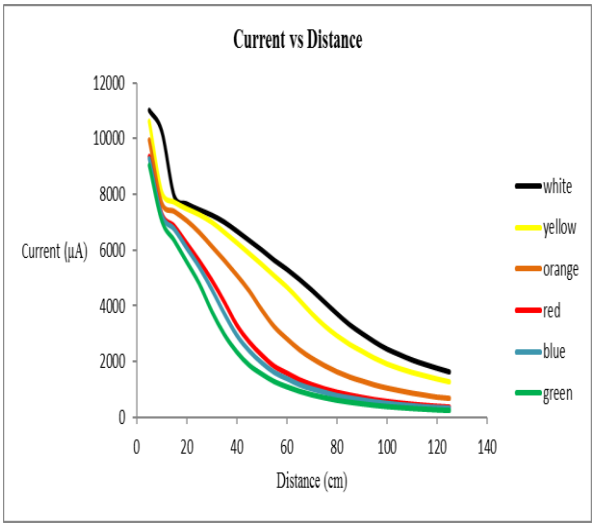


Figure 5 realization of current V/s Distance

Table-1 Average and Standard Deviation (σ)

Colour Filters						
	WHITE	YELLOW	ORANGE	RED	BLUE	GREEN
Average	5078.92	4517.72	3482.2	2627.48	2457.4	2158.16
Standard Deviation (σ)	2600.684616	2571.396811	2668.636611	2573.360699	2550.704734	2456.868082

Figure 4 and 5, is realized that when the distance increases, current decreases exponentially in a form of the given sequence WHITE > YELLOW >ORANGE > RED> BLUE > GREEN.

As the light level increases, current too increases exponentially. For all the color filters, as light intensity rises, the current change rises exponentially and for distance, the current change decays exponentially. Mehmet Ali özçelik (2018).Table -1 shows Average and Standard Deviation (σ) in current which shows green color filter has minimum standard deviation.

CONCLUSION

In the present study light intensity analysis has been conducted for color filters. Examining the variation obtained in light intensity and current with respect to distance, there is an exponential trend in sensors' response. Combining all other data from the observations, in terms of sensitivity. Phototransistor draws a better profile for green color filter with standard deviation 2456.868082.

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REFERENCES

L. A. P. Santos, F. R. Barros , J. A. Filho and E. F. da Silva Jr(2006), Precise Dose Evaluation using a Commercial Phototransistor As A Radiation Detector. Vol. 120, No. 1–4, pp. 60–63.

P.Balasubramaniam, P.Karthickkumar (2012) Indian energy crisis - A sustainable solution IEEE- International Conference on advances in Engineering Science and management (ICAESM-2012) March 30,31 2012, 411-415.

Ghassan, M.S., Hashimah, I., Debnath, N., Nadya, A. (2015). Optimal Light Power Consumption Using LDR Sensor. 2015 IEEE International Symposium on Robotics and Intelligent Sensors (IEEE IRIS2015), 144-148.

Özçelik, M.A. (2016). The Analysis of the Optical Measurement Sensitivity of the Photodiode and LDR Light Sensors. International Energy& Engineering Conference (UEMK 2016), 13-14 October, Gaziantep/Turkey, 688-695.

Juan, F.D.P, Bajo J., Rodriguez, S., Villarubia G., Corchado J.M. (2016). Intelligent system for lighting control in smart cities. Information Sciences, 372, 241–255.

Toufiq, I., Afshari, S., Sandipan, M. (2016). An Experimental Survey of Feedback Control Methodologies for Advanced Lighting Systems, Energy and Building, 130, 600–612. Vishay Semiconductors (2016). BPW34, Document Number 81521

Fathabadi, H. (2016). Comparative Study between Two Novel Sensorless and Sensor Based Dual-Axis Solar Trackers, Solar Energy, 138, 67–76, 2016.

Kamran, A., Khokhar, A.Z., Rahman, F. (2011). High responsivity silicon MOS phototransistors, Sensors and Actuators A, 172, 434-439.

Lau, K.T., Baldwin, S., O'Toole, M. (2006). A Low-Cost Optical Sensing Device Based on Paired Emitter-Detector Light Emitting Diodes, Analytica Chimica Acta 557, 111–116.

Phama, D.D., Suhb, Y.S. (2017). Remote length measurement system using a single point laser distance sensor and an inertial measurement unit, Computer Standards & Interfaces, 50, 153–159.

Baeq K. J, Binda M,Natali D,Caironi M,Noh Y.Y(2013) Organic light detectors: photodiodes and phototransistors.Aug 21; 25(31):4267-95. doi: 10.1002/adma.201204979. Epub 2013 Mar 11.

Mehmet Ali ÖZÇELİK (2018) A Comparison Study of the Optical Measurement Sensitivity of the Phototransistor and Photodiode. *International Journal of Research and Development* Vol.10, No.1, 79-84.

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ETHICS IN MANAGING HUMAN RESOURCES IN RELATION TO CHANGING SCENARIO

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ABSTRACT:

Ethics is a philosophy which deals with morally good or bad behavior which deals matters of value aesthetic way. Culture of any organization is cultivated by ethics and mission influenced by individual or groups within the organization. Human resource management is managing human issues, development and growth of organization by aesthetic and artistic way. Managing human resource in transparent, healthy and unbiased motivational atmosphere brings any organization at high performance level. Innovative managing techniques can make miracle in the progress of organization.

Key words: Ethics, Morally, Aesthetic, Mission, Unbias.

INTRODUCTION:

Ethics, morals, values and standards have become increasingly complicated in a society and in the working area where absolutes have given direction to ambiguity and tolerance. Human resource management is the key factor of changing scenario of society and any organisation. Human Resource Management is concerned with managing relations between different groups of people This process may raise vital questions about rights and the responsibilities of human resources. Ethics, morals, values and standards have become increasingly complicated in a society and in working area where absolutes have given direction to ambiguity and tolerance.

Today's organization are characterized by 'Work force diversity' that is workers are more heterogeneous in terms of gender, race, culture but different emotions & intelligence, physically disabled, reserved category person, sons of the soil, quotient diversity, gays, lesbians and who are significantly overweight. Sustainable ethical values can help to shift their

Philosophy from treating everyone equal. (Management, page 58 Stephen Robbins, Robin Stuart-Kotze, Canadian fourth edition, 1994). It is observed that ccontinuous innovations in technologies combined with the globalization have created unpredictable and challenging situations in the society. In order to sustain ethical values proper modification in the working system which will be flexible and able to implement quickly. The successful organization should be flexible, able to respond quickly and led by superiors who will effectively make revolutionary changes.

Observations–

Moral philosophy/ Ethics is a branch of philosophy that involves recommending concepts of right and wrong which concern matters of value in aesthetics and intellectual ways. Ethics is meaning relating to one's character or the science of moral duties Such as- Respect for others,

Courtesy, Loyalty, Humanity, Fairness, Honesty, Integrity, and Punctuality, Not to use abusive language and Respect ethical values of the environment.

Implementation and impact:

In Indian society and in the different workplaces, management of these diverse groups has resulted in the cropping up of human resource issues, related to manpower planning, selection and appraised. In a developing country, if opportunities get reduced due to the Quota System, those left out have to compete in a very narrow segment creating Emotional Stress and Strain.

In managing human resource, organization and superiors/leaders of the organisation should appreciate the strong ethical points of diversity and harness its positive effects which perhaps are the direction that professional management would seek to understand and integrate in organization of the future. Human resource management& ethics are no longer restricted to only sector but is applicable to all sectors. (P.N.Subramani, et al. 2001) Though the process of management criteria is different for developed, developing & under developed countries but some parameters has to be fixed in order to manage huge resource of human. It is observed that violation in the ethical values in the organization creates bitterness among team which gives adverse impact on the growth of organization. With elaboration by taking example of educational field;-

Educational field is the backbone of the society. In certain educational institutions due to lack of good managing techniques, employees suffer heavily from the financial crisis. Due to lack of management human resource not able to cope up the newer techniques, ultimately result in vast failure in the working system, which eventually experiences huge loss by the society. Another examples is- The overall result of this reflected in teaching, nonteaching staff and ultimately on students. Delay in the assessment and result declaration procedure. Furthermore delay in the admission procedure, improper implementation of newer techniques strategies, poor coordination, careless and unethical management system, severe financial crisis experienced by staff. This ultimately result in great failure in the educational system, which adversely reflected to the progress of society.

In order to overcome unethical system management of all institutions and organisation should practice and implement ethical standards.

MATERIALS AND METHODS

An India is being the populous country in the world with high levels of unemployment & under employment where there are certain categories of skilled manpower and need to manage human resource effectively, by inculcating certain codes and values of ethics. Human resource management, with varieties of culture, emotions, educational background intelligence and so on. In order to give best output; managing human resource with ethics is really big task. Private sectors, public sectors and educational field's environmental system are having respective goals, vision and mission. Ethical values are concerned, managing human resources irrespective of any sectors are needed to focus withis Changing scenario, that facing various critical issues. Certain remedies are discussed in order to cope up ehical issues in the working areas.

Focus on Employees Mental Health-

As per the survey about 89% of the population in India suffering from stress. People (1 in 20) suffer from depression,

making the issue of stress at the workplace more critical in these changing time managing. Arranging health and wellness program in every employee package employers can offer practical solution such as flexi hours or stress management motivational programs that include mental wellness. This ethical way can boost confidence level of employee. (Dr. Seema Mehrotra, The Times of India ,13th October 2018)

Grievence cell-

Constructing Grievance cell within the human resources team will resolve the various issues in the workplace.

Healthy working place—

Maintaining healthy, aesthetic, friendly atmosphere in the organization can helps team members to share new ideas.

Emotional & Intelligence Quotient – An employee with high Intelligence Quotient but Low Emotional Quotient should be handle very critically by employee. High Intelligence Quotient person is very useful to the organization. By attending wellness programmes and proper counseling he or she can overcome emotional problems and cope up the situation effectively.

Trained to Improve efficiency,

To improve the working scenario, human knowledge resource should be trained effectively by upgrading and allowing them to attend various programmes and implementing strong strategies in improving work efficienes such as exgratia, good incentives and facilities can create miracle in the productivity. In a constantly changing working environment job rotation, coaching, mentoring, attachment to head of the department or manager such factors are very useful. New knowledge, new skills, new attitudes have to be implemented to face the challenges of the future which ultimately helps this organization can survive and prosper.

Conflicts resolution:-

Genders in human resources should be treated equally. But in certain case to avoid critical situation, such as ego matter or any matters certain norms should be implemented in order to make harmony in the organization. Any conflicts issues are there those should be solved unbias and friendly way within the time limit.

Human resource satisfaction:

Hard worker Employee give good result with sincere efforts should be acknowledge with grace. Such employee is a treasure of the organization.

Improvement of performance and potential: To improve the status of mind, body and soul of employee, organizing health & diet camp, medical camps and various workshops, expert lectures should address with proper directions. Development of human resource is rather slow process, satisfied employee is become experience respocible for productive growth of organization. Treating human resource aesthetic way/treating ethical way grows the healthy environment in workplace.

Focus on Vision, Mission

Human resource management team should focus on Vision and Mission of the organisation and work accordingly.

Environmental management

Inculcation of best practices such as practicing eco-friendly products avoid plastics use less paper proper management of water and electricity, morals and safety of stakeholder etc. resolve various health and safety issues.

RESULTS AND DISCUSSION:

The beauty of achieving high caliber and well-motivated employees lies on how well the management manages and values such employees (Huselid 1995)

Ethics in managing human resource is the most important characteristic for any institution which is the resource of achieving competitive advantages. This

process is very tough as compared to managing capital or managing technology. Managing human resources required excellent back up by sound good ethical practices. In order to fulfill organizational goals; various methods can be practices effectively at managing the pool of human resources. Human resource management is no doubt a laboratory for ethical and moral values. Continuous research on these are necessary in order managing human resources effectively. But managing human resources effectively is challenging task. Proper, carefully implementation of codes of ethics in aesthetic way in working place will develop healthy team spirit which will make organization mentally and physically healthy. Such team not only accept global challenges but also overcome all problems with appropriate solution which helps to achieve the goal of vision & mission of the organization.

CONCLUSION:

Current changing scenario, globalisation, innovations in education field, developing and various in managing human resources with transparent ,healthy and unbias way brings any organization, society and eventually country at high performance level.

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REFERENCES:

Mark A Huselid, (1995) , Academy of Management Journal, Vol 35 No 3,635-672 .

P.N.Subramani,G. Rajendra.(2001) Human resource management and Industrial relations, *Paperback, 12665 Pages Himalaya Publishing House,*

ISBN-81-7866-157-8

Stephen P. Robbins,Robin Stuart Kotze, Management ,Canadisn 4th edition,ISBN-81-203-1503-0.

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Dr. Seema Mehrotra, Dept of Clinical Psychology, article The Times of India ,13th October 2018.

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ROLE OF STUDENTS IN EDUCATION

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ABSTRACT:
Role of student in education system is as learner's dialogues and interaction with peers and teachers, ultimately standard of academic escalation with their active role. Educational awareness, responsibility, accountability, collaborative, learning environment, respect, courage, punctuating, listening and refraining is all meets academic expectations. Within background, present paper focused on deeper understanding, building, relationship and principles of outstanding classroom management.

KEYWORDS: Criticality, Communication skill, Curricular planning

INTRODUCTION:

In educational system, student have two main important roles. Students need to understand the teaching-learning methodology.Teaching up to understandable level of students is the teacher's duty and make students to compete the world. The role of educational system in student's life is aware about the various aspects including societal and economical applications to upgrade the quality. This create meaning to the material given to the students. A student has to understand the objectives and outcomes of a study course. Regular reading of notice board and interaction with classmate and teachers to get idea about extracurricular and extramural activities. This keeps the student motivated and develop student's personality. Thus helping to tickles alive the thinking faculty of brain. Students should review the collected material from various reference books, journals and various learning resources for learning preparations and timely submission of assignments. To uplift and upgrade the society, quality education for students play vital role in nation building which includes quality teaching, time management learning (www.education.gov.in).Second role of students is to choose their subject of interest and purpose the career in same being friendly, courteous, and polite is effortless, finally effective, accurate communication skills. Students should appreciate their role in a formative assessment classroom environment. Student behaviors include: engaging with learning goals, emerging achievement, providing-receiving feedback from teachers and peers etc.(Mary Ryerse 2018). In order to meet such expectations, the students will have to be morally, mentally and healthily sound and applying practically experience is learning are couple of major roles a student has to undertake because education is powerful tool to change the world. (Vijay Kumar, 2012). Hence, present article focused on various role of students.

METHODS:

I] CONVENTIONAL ROLE

Training mind is the training to brain is the basic concept observed in conventional role of students which is as follows-

Honesty:

According to ancestors, honestly is the best policy because it includes trustworthy, loyal, fair, and sincere. The perks of being honest

is that students don't have to lie and don't have to remember the lie. Simple guideline for honesty is be honest to self-honest people are never let down students morale and hence its help them to shine brighter.

Compassion/Respect:

Everyone wants to be accepted and appreciated. If you want yourself to be respected you have to respect others. One of the most important things to remember about respecting others is to not judge people who are different from you.

Fairness:

Number of time students have felt that they were being treated unfairly. Voice your feel with dignity and rightfully. Students need to balance their personal needs with others. Express your views regarding educational pattern and being treated with justices.

Accountability:

Accountability is accepting significantly once actions and faults. Blaming others for our mistakes is dishonest and unkind. Never make excuses they worsen the situation so do want you say this is how people will start believing and trusting in you. It's better for everyone in the long run.

Courage:

It is nothing but ability to control fear, pain and do the right thing. Doing right is not fun or popular, one have to be brave enough to decide right and wrong. Students follows crowd without inspecting the aim of system. Responsible behavior is always believing in once decision. Confidence in decision making will positively reflects in future.

II] NOVEL ROLE OF STUDENTS:

Along with conventional role all round drawing of the best students, Developing patriotism, creativity in mind with fun , serenity, intelligence etc. are need to inculcate among the students and the same shall be followed regularly education system. For it students plays following role-

Curriculum Planning:

Student own experience from education are able to give advice on student resources and facilities because curriculum is blue point of an education programme. Teaching-learning is dependent on curriculum. All planning regarding teaching-learning process in institutions, universities and in colleges and other stakeholders is responsible for the development of society. Teachers are curriculum maker and students are learners. All stakeholders, method, organizer, statutory bodies etc. with adequate communication, moral and focused implementation are the roots of the educational system. The client student need to actively involve in the process with preparation, classification, realizing the key value in charge in curriculum (Curriculum Guide 21 October 2016).

Self-discipline:

The concept of discipline is nothing but truly understanding. The most successful people in life exert discipline on a daily basis. It is vital to every living being and without it, the world around them would be chaos. To be a great and inspiring leader, one must constantly display restraint. Not giving into something you truly want is a sign of strength. Making the right decisions in life can make or break you, and this type of person tends to make the right decisions. Regardless of where you exert this self-restraint, it will help to promote achievement in your life. (www.sunyjcc.edu)

Role in Student council:

The student council helps share students' ideas, interests, and concerns with teachers and institute/school principals. They often also help raise funds for school-wide

activities, including social events, community projects, helping people in need and school reform. Most schools participate in food drives, fundraisers and parties. Many members learn skills that were an extension of their formal education. It develop leadership quality among students. An example of the structure of an elementary student council may include a president, a vice president, secretary, and treasurer, sergeant of arms, fundraising officer, historian, boy's representative and girl's representative. These roles of each position is well defined in education system. In and every college activities students representative have right to add their knowledge which is for students benefits. All positions may be assigned or voted on, either within the student council or by the entire student body. They may also reflect descending grade-levels, with the president in the oldest grade, and so forth. Secondary school governments often have more independence and power than younger governments. Often a student government is overseen by a sponsor, which is usually a teacher at that particular school. Most junior or middle school student councils have a constitution of some sort and usually do not have a judicial branch. Compared to elementary school councils, junior high and high school councils generally have fewer people.

4) Students right and Responsibility: (Studentification: A Guide to Opportunities, hallenges and Practice) All students have the right to learn in appropriate environment and get treatment from learned community. Institute shall provide conductive environment for learning. Hence, it is necessary that students should be aware of the following responsibilities:

1) Student should be punctual in the classroom as well as in the laboratories, 2) they should take care of all infrastructural facilities in the alma matter 3)Timely completions of all the classwork, homework, tutorials, and assignments. 4) Student should have the courtesy of not learning the class without teacher's permission 5) Take part in interactive sessions, group discussions, online learning system, 6) Student should respect the staff and students, preciously, 7) Student Should watch their behavior and manner, use common sense and 8) wear clean dress within code of conduct. (W.A. Cunningham I.S. 234 2012) 9) no divergence to be made in male and female.(www.is234.com)

CONCLUSION:

Students must realize the importance of the relationship between an individual and the society. The society is the manifestation of that united existence, and the students are part of the society. Even a school-going student is bound to have links with other people who together form a society because students plays an important role in improving and strengthening the society.

REFERENCES:

1)www.education.gov.in
2) Mary Ryerse (2018) The role of formatives assessment: how I know practitioner guide
3) M. S. Vijay Kumar **(2012)The New Landscape for the Innovative Transformation of Education.** Social Research: An International Quarterly, Volume 79, Number 3, 619-630.
4)www.sunyjcc.edu
5)Studentification: A Guide to Opportunities, hallenges and Practice
6) www.is234.com

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CODE OF ETHICAL CONDUCT IN HIGHER EDUCATION IN INDIA: ISSUES AND CONCERNS

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ABSTRACT:

Our culture considers education as true wealth. Vidya gives vinayam, dhanam, dharmam and sukam says a Sanskrit shloka. Promotion of education, science and culture will anchor peace and security in this world believes the United Nations Educational, Scientific and Cultural Organization. The importance of education is universally recognized and the right to education has been exalted to the position of a human right repetitively in various international instruments.

Keyword: Bar Council, National Council for Teacher Education, Code of Ethics in Higher Education

INTRODUCTION;

Kedil vizhuchelvam kalvi, oruvarku Maadalla mattrai yavai- Tamil Saint Poet Tiruvalluvar

(Indestructible wealth is education for a person Nothing else is wealth)

The whole business of education should be tuned to ethics in order to reap the real benefits of education. Education is not mere transfer of the content but the whole mechanics by which the transfer is effected and realised. Ethical standards of conduct should govern every player so that education remains righteous, venerated and valued. Ethics means standards that determine acts as right or wrong and punish deviations. They are not some moral parameters that are recommended as desirable.

The object of this contribution to the National Symposium on Educational Ethics and Ethics in Research is to study the regulation of ethical conduct of the stakeholders in higher education and to share the issues and concerns therein.

Ethics should inform all stakeholders in higher education. Education is a subject for legislation and governance[i] and the first stakeholder is the State. There is rightly a Ministry of Human Resources Development, formerly the Ministry of Education. There are two Ministers of State under it and a Department of Higher Education. Constitution of India (COI) recognizes right to education under Article 21A as a fundamental right. Verma Committee states that right to education means education of quality and substance with a certain degree of transformative potential.[ii]

COI also imposes a duty on the citizen-parents and guardians to educate their children and wards.[iii] The Constitution mandates the State to provide education to children below the age of six years,[iv] to ensure right to education in some deserving cases[v] and to promote educational interests of scheduled castes, scheduled tribes and other weaker sections of the people.[vi]

In our federal structure the Parliament is entrusted with the subject of coordination and determination of standards in institutions for higher education or research and scientific and technical institutions[vii]. It is curious to

note that the COI does not stipulate minimum educational qualifications for the Members of the Parliament, Ministers and the Members of State Legislature. However a few state legislatures have prescribed minimum educational qualifications for the local body members and that prescription has been upheld by the Supreme Court of India.[viii]

The State has through various legislations established recommendatory, regulatory and accrediting bodies for higher education, technical education and professional education like the University Grants Commission (UGC), All India Council for Technical Education, National Council for Teacher Education (NCTE), Bar Council of India, Medical Council of India, Nursing Council of India and National Assessment and Accreditation Council. State has also established public universities under central law and state laws. Under these universities there are their affiliated colleges and conducted colleges. There are also the private universities, the deemed to be universities, autonomous institutions and autonomous colleges affiliated to universities.

State takes the support of private initiatives in the mission of education. Private trusts and societies run educational institutes affiliating their institutions to universities/ boards with or without the financial aid of state play a valuable role in the promotion of education. The student community, the faculty members and the supportive staff members of educational institutes, parents of students and NGOs working in the field of education are important stakeholders.

MHRD has declared its vision as the realization of India's human resource potential to its fullest in the higher education sector with equity and excellence. In its mission statement, among others MHRD has resolved to promote the quality of higher education by investing in infrastructure and faculty, promoting academic reforms, improving governance and institutional restructuring towards the inclusion of the hitherto deprived communities[ix]. The fundamental duty of all citizens to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement[x] recognized in the COI is non – negotiable. The COI further calls upon every citizen to develop scientific temper, humanism and the spirit of inquiry and reform.[xi] The SC has held the fundamental duties of citizens to be duties collectively on the State.[xii]

The purpose of Code of Ethics

Ethics and integrity are the responsibility of each individual. A code may not guarantee nil deviant behavior; but to go without it is not only unprofessional but also fraught with danger. A community or organization adopts its core values and states its resolve in the ethical, legal and professional behavior to the interacting world.

A code of ethics ensures alignment of the actors-members to the core values of the community or organization. The code creates an ethical framework for the functioning. It lays down the standards to which the actors-members are held. It requires a sense of responsibility, direction and unity to act honestly and with integrity. The people who deal with the organization are guaranteed standard services. The organization ensures accountability of the actors-members. The code of ethics infuses fairness as it lays down clearly the rules for behavior and thereby acts as a preemptive warning.

Codes are value based and compliance based. Code of ethics should be a living document that guides the actions and decisions. When the organization is bound to the resounding theme of ethics from top to bottom, success is inevitable. Unethical practices will demoralize employees and the resultant unrest and dissatisfaction will affect their performance. This will in turn tell upon the performance of the organization. Productivity

undoubtedly increases when morale is high. The public trust is also built upon the ethics of the organization. A formal code of ethics that is well published can shield an organization against unfortunate breaches of the code by individuals.

Code of Ethics in Higher Education

The code of conduct for the Ministers is laid down by the Government of India. It is however not called code of ethics. The requirements as to declarations of assets, severing self from business, not accepting gifts, etc are listed in the code.[xiii] This does not have the backing of law but enforced by the Prime Minister at the centre and the Chief Ministers at the states. There is no code of ethics for civil servants. Yet there is a code of conduct laid down by the Civil Services Conduct Rules, 1964 and this has the force of law.

In 2007-8 a bill was introduced in pursuance of the Second Administrative Reforms Commission[xiv] to regulate and improve public services and to lay down the ethics and values of public services but could not be passed. The Draft Public Services Bill, 2007 [xv] listed the following values of Public Services under section 6: The Public Service and the Public Servants shall be guided by the following values in the discharge of their functions: (a) patriotism and upholding national pride; (b) allegiance to the Constitution and the law of the nation; (c) objectivity, impartiality, honesty, diligence, courtesy and transparency; (d) absolute integrity.

Section 9 of the bill required the Government to promote the Public Service Values and a standard of ethics in the Public Service operations, requiring and facilitating every Public Service employee - (i) to discharge official duties with competence and accountability; care and diligence; responsibility, honesty, objectivity and impartiality; without discrimination and in accordance with the law; (ii) to ensure effective management, professional growth and leadership development; (iii) to avoid misuse of official position or information and using the public moneys with utmost care and economy; and so on. The Government was further required to prepare a Public Services Code of Ethics for guiding the Public Service employees within a year. The specialized organizations were permitted to frame additional service codes in alignment with Public Service Code.

Recently the Vice President of India has called for a code of conduct for the MPs and MLAs to ensure that the people do not lose faith in political processes and political institutions.[xvi] The Rajya Sabha and Lok Sabha have permanent standing committees on ethics. These committees have the functions of overseeing the moral and ethical conduct of members, preparing a Code of Conduct for members and to suggest revision from time to time, examining cases of breach, tendering advice to members on questions involving ethical standards either *suo motu* or on receiving specific requests.[xvii] No code is yet prepared although complaints are examined.

Code of Ethics for teachers

Whereas it is proudly claimed that teaching profession is the mother of all professions – is there a code of ethics for this profession? The lawyers have a code of ethics framed by the Bar Council of India; the medical practitioners have a code of ethics framed by the Medical Council of India. The Nursing Council of India has laid down the code of ethics for the nurses. These are a few examples.

Profession is an occupation that requires mastery in a complex set of knowledge and skills through formal education. Teaching is a remunerative occupation that involves a prolonged training and a formal qualification in a specific branch of knowledge. UGC requires clearance of a national eligibility test or state eligibility test for lecturership. These tests again evaluate the knowledge in the

subject; evaluation style is multiple choice questions. There is no test on communication skills, articulation, teaching methods etc to check whether the person can teach effectively. It is probably taken for granted that a postgraduate in that subject with a pass in NET/SET is fit to teach without any formal training in teaching. In post graduate studies in law several universities prescribe a paper in legal education, teaching and research. However masters' degree in science, arts and commerce do not have such papers on teaching. NET/SET is not required for some faculties like medicine, engineering, pharmacy, nursing and architecture. The educational qualification in the subject is seen as the sufficient requirement for teaching without any special training in the different teaching pedagogy, planning for teaching etc. It is pertinent to consider the stark difference in the requirement of qualifications for teaching in schools and for teaching in colleges and universities. School teachers need qualifications in education. It is a difficult to accept that the difference in the age of the students can be a sufficient justification to ignore the importance of training in teaching for the university and college teachers.

One other distinction that cannot be overlooked is that while in other professions, the professionals are members of the professional community and practice freely on their own terms and fees, subject to the condition that they abide by the professional code of conduct, the teachers are employees of some institution on terms and salaries fixed by the institution or law governing that institution.

Efforts of UGC

The UGC Act, 1956 established UGC for the coordination and the determination of standards in Universities. The principal functions entrusted with UGC are allocation and disbursement of funds to the universities and recommendations and advice to the universities and the central government and state governments. Prescription of code of ethics although is not directly entrusted, UGC may assume the authority in this regard by resorting to the following under section 12 that lists the functions of UGC–

1. The opening words of S 12: "It shall be the general duty of the Commission to take, in consultation with the Universities or other bodies concerned, all such steps as it may think fit for the promotion and co-ordination of University education and for the determination and maintenance of standards of teaching, examination and research in Universities, and for the purpose of performing its functions under this Act,"
2. S 12 (d)
3. S 12 (h)
4. Section 12 (j) which is a akin a residuary clause in the provision reads as follows: perform such other functions as may be prescribed or as may be deemed necessary by the commission for advancing the cause of higher education in India or as may be incidental or conducive to the discharge of the above functions.

As late as on 27 Dec 1988, UGC adopted a Code of Professional Ethics for University and College Teachers. A task force was appointed by the UGC for the purpose of preparing a code of ethics and its report was adopted. All India Federation of University and College Teachers Organization participated with the task force in the preparation of the code.

The Code of Professional Ethics is in 7 parts

I. Teachers and their responsibilities
II. Teachers and the students
III. Teachers and colleagues
IV. Teachers and authorities
V. Teachers and non-teaching staff
VI. Teachers and guardians
VII. Teachers and society

It is highly surprising that recommendations of UGC golden jubilee seminars- 2003 held at eleven universities in India titled "Higher Education in India - Issues, Concerns and New Directions" do not include anything on ethical code for institutions, teachers and students. Code of Professional Ethics For School Teachers has been adopted in 1997 by NCERT and in 2010 it was revised by NCTE. S 24 of the Right of Children to Free and Compulsory Education Act, 2009 lays down duties of teachers. These duties include being punctual and completing syllabus and paper correction in time. Hence NCTE took the initiative to adopt a code; that code has no legal force yet.

Maharashtra Public Universities Act, 2016

The responsibility of the universities in ensuring ethical behavior in the university and colleges is conspicuous. Section 4 of the Maharashtra Public Universities Act, 2016 on 'Object of the University' has a number of objects listed therein. Some of which have a direct nexus to ethics-

1. Promote discipline and the spirit of intellectual enquiry and to dedicate itself as a fearless academic community to the sustained pursuit of excellence (Sec.4 (2))
2. Provide for efficient and responsive administration, scientific and technology management and develop organization of teaching, learning, training, research and extension (Sec.4 (9))
3. Strive to promote competitive merit and excellence as the sole guiding criterion in all academic and other matters relating to students (Sec.4 (18))

Section 5 of the Act details the powers and duties of university. The following in the provision seem to authorize and fix responsibility on the university to frame and enforce a code of ethics-

1. To supervise, control and regulate the conduct and discipline of the students of the university, colleges, institutions, recognized institutions, schools and hostels (Sec.5 (33))
2. To make arrangements for promoting the healthy atmosphere, corporate life and welfare of the students of the university, colleges, schools and institutions (Sec.5 (36))
3. To make arrangements for promoting welfare of the employees of the university (Sec.5 (37))
4. to regulate and provide for attendance of the teachers on the premises of the university or colleges or institutions during the teaching hours and beyond teaching hours, as prescribed and to prohibit teachers from taking or conducting private tuitions or private coaching classes (Sec.5 (41))
5. To enforce conduct and discipline rules for teachers and non-teaching employees prescribed by the State Government (Sec.5 (43))
6. To prescribe code of conduct for managements (Sec.5 (44))
7. To prescribe and enforce Students Charter (Sec.5 (45))
8. To evolve an operational scheme for ensuring accountability of teachers, non-vacation academic and non-teaching staff of the university, institutions and colleges (Sec.5 (66))

Several Universities, including Mumbai University, have not framed their code of ethical conduct; whereas some are in the process of doing so. Indian Academy of Sciences has notified in its website - "Scientific Values: Ethical Guidelines and Procedures". Indian Institute of Science Education and Research, Pune has also adopted ethical standards under the title "Guidelines on Academic Ethics"

Code of ethics for students

Indian Institute of Science has published its Students' Handbook on Code of Ethics and Conduct along with standard procedures in its website. It is incumbent upon the students to abide by the code. The code is to administer discipline and promote growth through responsibility. The code seeks to enforce discipline within the campus and also over

grave acts beyond the campus. The code, in detail, lists the various undesirable acts which range from sexual harassment, drugs abuse, possession of arms, violence etc. to parking in no parking area, refusing to show identity card, mishandling of thrash in the campus, misuse of social media, inviting media without permission of authorities. The code also lays down the procedure for complaints, investigation, decision, appeal and enforcement. List of disciplinary actions are also provided in the code.

The Indian Institute of Science includes in its Code the guidelines on academic integrity under a special head as it is a premier institute for advanced scientific and technological research.

The Institutes of Technology Act, 1961 declares the institutes of technology as institutes of national importance.[xviii] Section 6 that lays down the powers and duties of the institutes includes student discipline but does not include code of ethics in particular. Section 26 that lists the matters for statutes making by the board although includes qualifications and schemes benefiting teaching and other staff, it is silent about any code of ethics. IIT Delhi has in its website anti sexual harassment policy and anti-ragging policy with all rules of procedure of complaints. It its statement of vision, mission and values it is pertinent to note that it has listed academic integrity and accountability as the first value.

National Institutes of Technology, Science Education and Research Act, 2007 governs the national institutes of technology as autonomous institutions under National Institutes of Technology Council. The National Assessment and Accreditation Council's (NAAC) value framework states that it seeks to promote inculcation of a value system among students and quest for excellence. It has stated as its mission, inter alia, that it shall stimulate the academic environment for promotion of quality of teaching-learning and research in higher educational institutions. NAAC has stipulated code of conduct and maintenance of ethical standards for its peer team that visits institutions for assessment.

Goa University has adopted a code of conduct and has published in its website[xix]. The focus is on ethical conduct in academics and research. It has called upon the affiliated colleges to adopt similar code. The University of Mumbai has not notified any code of ethics for students and teachers. Recently UGC notification on Plagiarism has been adopted by the University of Mumbai and an anti plagiarism committee has been constituted. University Grants Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations, 2018 allow only 10% content similarity in publications and research work. 1992 Directions governing terms and conditions of service of teachers appointed in the non-government constituent colleges and affiliated colleges of the University of Mumbai to apply to full time and part time teachers on time scale of pay prescribes a code of conduct and says that breach will amount to misconduct.

Issues and Concerns

There is no serious, uniform code for students and college teachers in India. There are a variety of teachers- full time permanent, full time adhoc, part time, visiting faculty on clock hour basis, guest faculty etc. the definition of teacher in the Maharashtra Public Universities Act, 2016[xx] is not comprehensive to include all the actual types of teachers working in the universities and colleges. There is no proper procedure laid down to handle disciplinary action. Every university should adopt codes and mandate the colleges to adopt them. The code should cover academic integrity, human rights requirements, general law of the land and discipline.

[i] Entries 63-66, List I and Entry 25, List III, Schedule VII Constitution of India. Also see Schedule XI entry 17 entrusting education including primary and secondary to Panchayats and Schedule XII entry 13 making promotion of cultural, educational and aesthetic aspects a duty of Municipalities.
[ii] The Committee that was constituted by Government of India to recommend amendments to criminal laws in respect of rape and other sexual harassment of women in 2012. www.prsindia.org viewed 30/1/18
[iii] Art 51A (k)
[iv] Art 45
[v] Art 41
[vi] Art 46
[vii] Entry 66, List I, Schedule VII
[viii] Rajbala v State of Haryana, AIR 2016 SC 33
[ix] Citizens/Clients Charter, www.mhrd.gov.in viewed date 7/11/18
[x] Art 51A(j)
[xi] Art 51A (h)
[xii] AIIMS Students Union v AIIMS, AIR 2001 SC 3262
[xiii] Code of Conduct for Ministers, Government of India, www.mha.gov.in viewed date 7/11/2018
[xiv] darpg.gov.in/**arc**-**report**s viewed date 7/11/2018
[xv] https://dopt.gov.in/sites/default/files/PublicServiceBill_2007_0.pdf viewed date 19/11/2018 approved professor, associate professor, assistant professor, reader, lecturer, librarian, principal, Director of an institution, Director of Knowledge Resource Centre, Director of Centre of Lifelong Learning and Extension, deputy or assistant
[xvi] Need code of conduct for MPs and MLAs says Vice President Venkaiah Naidu, The Indian Express, 5 Sept 2018, https://indianexpress.com viewed date 19/11/2018
[xvii] https://rajyasabha.nic.in/rsnew/committees/committ_ethics_rules.asp
[xviii] Section 2
[xix] www.unigoa.ac.in
[xx] See, Section 2 (61) "teacher" means full-time librarian in the university, college librarian, Director or instructor of physical education in any university department, conducted, affiliated or autonomous college, autonomous institution or department or recognized institution of the university ;

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ICT TECHNIQUES IN RELATION TO HIGHER EDUCATION

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Abstract:

Economic, cultural and social development of any country is depend on the development of its educational system which is also pivot on quality culture, continuous innovation, knowledge, and ability of educator-learner. Information communication technologies (ICT) is potential powerful tool leads to improve teaching-learning methods for enrich and transformation in education system. The teacher has to enhance teaching methods and serving the student's SWOT. The present generation is a multimedia generation and thrust to learn to serve family, society and country at one click. Hence, need to add various technologies and skills and values addition in education system. Web-based technologies, Pedagogical integration of ICT makes for a dynamic educational environment. Hence, the present article focused on ICT techniques in relation to higher education and its benefits.

Keywords: VARK model, Social media, Science citation index

INTRODUCTION:

Education is the tool for transformation in social and economic life of society. The education leads direct or indirect inculcation of values. In direct education, classroom teaching-learning, practical's, reading, writing, recitation, hands on training as per the designed syllabus, while indirect education is experience by ages.

Teaching method refers to the general principles, pedagogy and management strategies used for classroom instruction. The theories organised on a teacher-centered approach versus a student-centered approach, and high-tech material use versus low-tech material use.

According to Neil Fleming External link's VARK model of Student Learning. VARK is Visual, Auditory, Reading/ Writing Preference, and Kinesthetic. This model also called as VAK which eliminates Reading/Writing as a category of preferential learning (Fleming & Baume, 2006).

The teaching learning is the cycle of education which drives hand in hand by communicating among the stakeholders to solve the problems in education. Hence, need to focus on E-learning sources for example the audio-visual kits which more powerful problem solving tools in the field of education. E-learning is Learner-Centric Learning, lifelong learning, Flexible Learning and personalized learning where all required effective Communication.

Various devices/technology in ICT includes teaching learning:

ICT is generic term which transfers one form to other form thereby giving positive impact on governance, society and economy. Record, store, Retrieve, transfer and receive information are the process for the development of personal and professional skill. IT refers to hardware, software and computer network.

Distance learning, e-banking, e-commerce, work-from-home, and e-government are the key output of networking. Technologies are already accepted by the young generation however a cultural shift are not always recognized in an educational environment.

I) HARDWARE:

General ICT tools for teaching and learning

- Desktop, laptops, tablets, Ipads, Popplet, Ipods, Projector, Printer, Photocopier, Scanners
- Storage systems - Pen Drive, DVDs and CDs, hard disk, Flash discs, USBS
- Web Sites Audio-visual learning aids, video Games, Bluetooth technologies
- Digital cameras, Web boards, Microphones, interactive white board
- **ICT tools for teaching and learning** text magnifier ,head wands, keyboard for cerebral Percy ,braille, typing aids large prints, audio books etc.

II) SOFTWARE:

When teachers are digitally literate, they try to integrate it into curriculum and their teaching methodology. Teachers are replacing chalkboards with interactive digital whiteboards, smart phones and also uses "flipped classroom" model. These techniques are more interactive and effective antennae its impact on students mind. E-readers/e-books are having thousands of reading material but required longer storage of battery and portability. Flip classroom is the concept of cooperative learning activities.

For enhancement in higher education, needed internet connectivity and security measures such as filters and site blockers. ICT literate teachers by providing digital content in pedagogical setting , students is going to learn at home which gives more impact in student learning. These tools flexibly and dynamically deals with various functioning representations such as graphs, formulas and tables etc.

Administrators need to make available facilities for the teachers/stakeholder. The facilities are internet connectivity, technical support, software, aided classrooms and thereby use of policies for establishing infrastructure and allowing students to explore ICT techniques. Policies need to be framed intentionally in order to bridge the gap in this divide and bring media, internet, software and digital literacy to all students. There has been a trend in education, to improve the effectiveness of teaching which required high quality multimedia enriched content in different discipline and courses. According to Vimal Bakshi and Rarh (2012 effective teaching includes multilingual conversion, capacity building of teachers and students in ICT skills and state of the art infrastructure for the dissemination of the content to the learners.

III) COMPUTER NETWORKING:

LDCs, radio, TV and satellite distribution of electronic content are revolutionary' ICTs in education but fewer beliefs as compare to computers. Computer-aided instruction is the replacement of teachers while as multi-channel learning' connect learners with information, knowledge, stimulation, and to mediate those interactions but it is associated to blended learning approaches.

Satellite broadcasting of electronic educational resources, Hotspots, new Internet technologies, Mobile Internet centres, and Community telocentric, handheld devices provided less access to learners. The effectiveness of such tools in education is depends on use in teaching learning process.

ROLE OF SOCIAL MEDIA AND ITS NETWORKING:

Now a days, use of recent information communication technology and social media like template, Viber , IM, VoIP, WhatsApp, google+, Facebook, twitter, LinkedIn, Instagram, Skype, Flickr, blogs and wikis, RSS really simple syndications, web blogs, Podcast ,bulletin board etc tools are used for effective communications. Lerner is benefited through these social networks from industries and corporate sectors for comprehensive and specialised knowledge. Social media is focused on currents issues and perspective ultimately effect on society.

Virtual community including my space, massive multiplayer online, chat room (photo bucket, flicker) popular services like you tubes are the communication pathways up course by using security firewall.

Access of course materials through remote devices, Online digital repositories for lectures, course materials, and digital library, systems, employing the flipped classroom concept, making use of handheld and tablet computers, computers, audio players, projector devices etc. are the requirement of today's education which advances the education system with its equality at international level.

Teaching-Learning communications are made through video conferencing, chatting or virtual classroom, slide shares, chatting room etc. which is time saving for learners as well as stalwarts. Dissemination of knowledge fast and one to one is more effective. Teaching channels, teacher's tubes are the libraries that providing numerical lessons. Learning process is any time anywhere due to interaction, understanding issues which solves real time world problem in education.

Artificial intelligence is playing pivotal role in inside and outside the classroom without language barrier which provides statistic input without human touch.

Planning and executions-

To maintain and improve educational quality, planning and executions of strategies are primitive factor. G suites external link (Gmail, Docs, Drive, and Calendar) are very good for the preparation of Academic digital calendar / planner and executions may be recorded in google digital diary as well in google drive. Nowadays many education institute are using this techniques for their annual planning due to NAAC requirement. For the same process, "Trello" software is executed by various industries for planning as well as for feedback, action taking and communication.

Admission management system-

Online admission is a powerful techniques where students can enrolled from anywhere and track their status. It gives automatic alert mail, upload documents, track application status, register for assessment tests, view test scores and pay registration fees. Application test, accesses real time report, one can view application history.

Attendance management system –

The biometric tracking is accurate, fast, convenient and effective tool for the protection of student identity than the traditional roll call, paper based attendance. Traditional attendance method is time consuming, cannot prevent proxy attendance while biometric is fast, accurate and prevent errors &eliminates proxy. Biometric attendance management system is introduced by many institutions. The biometric attendance at VPM's B. N. Bandodkar College of Science, Thane is operated for teachers to track check-in and check-out while for students digital attendance is recording to get statistically data of students by using Radio frequency identification card (RFID).RFID/Smart

card system for entry at the college campus and library. RFID/Smart card special chip is embedded to track students. Biometric attendance of Staff members is mandatory to enter in the campus. ICT support socioeconomic growth. Service provide to the nearby school colleges and society through web site such as admission brochure, library information. Students reduce truancy, enhance punctuality, improve focus, retention, achievement and success.

Examination and Evaluation of papers-

Examination mechanism is become transparent and effective tool for assessing the quality of the students due to ICT which reliability and efficient. ICT friendly method of assessment/ evaluation of papers (OSM) were started by university of Mumbai 2016. VPM's B N Bandodkar College of Science, thane (BNBCS) is one of the assessment centres. For this well-equipped compute laboratory and internet facility with University matrix is required.

It avoids the errors of extra and proxy marks of same question and its sub question or extra questions solved by students and minimizes the efforts of total. It is easy and time saving methods of assessment and evaluation.

There are many online examination system are doing by institutions on the track of MSCIT which provide immediate results to students.

Administration and management:

Communication technologies is more flexible to deliver contents in higher education. It play important role to maintain the education and work. Informative tools, situating tools, constructive tools, communicating tools, avoiding duplication of work determines the cost and quality of the administration of the higher education. However, lacuna observed in communication to observe the balance between ICT and accountability, transparency, control, licence, policies for the democratisation of higher education.

Proactive environment develops the quality of stakeholder. Indian government introduced Digital India to develop the Indian economy which real time analysis to develop the government and citizens. The same tools if used by administration and by college management for the sustainable development in the field of education. Administrative head, principal, head of the departments, coordinators of various committees by adopting ICT techniques play the role model and transformational leaders with keeping records collection of data, financial matters .

ICT courses techniques:

Students should registered for Massive Open Online Courses (MOOCs)/ Swayam like the coursea, khan academy, e-PG Pathshala, sailor, open sources, Swayam, Ed tech leader online and edx enlighten the education system because there is a huge demand for off-the-classroom learning facilities.

The advantages and disadvantages of using ICT as a mediating artefact in classrooms compared to alternative tools. One way it improves the quality of education by using efficient technology in an institution which open up more opportunities for stakeholder.

Students are using movie making software along with the power point presentation, animations, Ubuntu, computer trouble shooting, D space, Smart Board are the teaching methods. It offers opportunities for creative expression, more flexibility in terms of time, location and preference of learners.

Digital literacy movement -

All institute should take efforts to educate the students and teachers for digital literacy. Bandodkar College took initiation by arranging five days' workshop on "BNB Edu Tech" from 18th Nov- 25th November 2017. Also arranged various modules for students through the research scholar program for the students.

Feedback – Several institutes are taking their feedback of various activities is collected on Google forms as well online.

Internet facility-

Internet and Wi-Fi connectivity helps learners connected with all stalwarts and globally competent. Online interactions would facilitate learning without time constrains and it will be much easier to conduct assessments and generate reports, since the necessary information doesn't have to be manually handled. Our campus B N Bandodkar College is come under LAN/WAN facility that help teachers and students by various means. College is having computer, printer and relevant infrastructural facilities for the examination. Also in our campus Jio Wi-Fi hotspots were installed so that student can access digital content in their mobile to search online study material.

All teaching staff member were given our local email ids address to communicate officially. According to UNESCO, "Measuring ICT in education is therefore important to inform policy makers in setting national priorities and developing ICT in education policy." (Jamlahadin Mostafa 2017) Enabling ICT in institutions will also be useful for NAAC, NBA, and ABET accreditations. To summarize, enabling ICT in education and internet goes hand in hand which facilitates research linkages and development in the field of education. ICT making use of technology in education creates an easy-to-manage learning environment where the delivery of information is so much smoother and the learning easier.

To sharpen the young minds software's are required such as Gamification software (such as 3D Game Lab External link and Class craft External link), Education-focused social media platforms, Technology for accessibility External link for students with disabilities.

ICT in Research -

Quantitative survey method and qualitative focus group methods are required to design proposal and number of subjects required simulation and modulation. Critical thinking, research, and evaluation skills are changing processes of teaching and learning. Research is systematic, critical and self-critical enquiry which objectives to contribute for the advancement of knowledge. Network resource centre is the best ICT base research facility. Use of e-resources and digital documents also facilitates high level research. In the fourth amendment UGC has already made it compulsory to publish research papers in INDEXED Journals notified by UGC. Web of sciences includes science citation index (SCI), Sci-finder scholar, beilstein Gmelin,Sci-pub etc. Nowadays conferences also arranging by various institute on whatapps, and online / electronic.

CONCLUSION:

Technology is the most effective way to increase the student's knowledge online and offline anytime anywhere and by anyone. ICT increases the flexibility of delivery of education. ICT play vital role in building the society. It change in the way of learning educational services accessible authentic to all rich, poor, literate, illiterate, oldage and young age and promotes transformation of education from teachers to students to society and vice a versa. ICT techniques are cost

effective fast communications, more flexible and more diversified.

REFERENCES:

David Nocar, Tomas Zdrahal (2016) ICT Tools Used In Teaching And Learning Concept of Function In School Mathematics Proceedings of ICERI2016 Conference 14th-16th November 2016, Seville, Spain 11-16. DOI: 10.21125/iceri.2016.1003.

Fleming, N., and Baume, D. (2006) Learning Styles Again: VARKing up the right tree!, Educational Developments, SEDA. Ltd, Issue 7.4, Nov. 2006, p4-7.

Gema Sáez Rodríguez and Antonio J. Monroy Antón(2011) The use of ICT tools in physical sciences education International Journal of the Physical Sciences Vol. 6(4), pp. 944-947.

Jamlahadin Mostafa, Sayyad Ahmad Hashmi, Pari Sasahabhai, Maryam Barahman (2017) The role of ICT in learning- teaching process. *World scientific NEWS* 72, 680-691.

Vimal Bakshi and Rarh (2012).Chemistry education in 21st century challenges and opportunities .Science Reporter 38-42.

Yehudit Judy Dori, Susan Rodrigues, Sascha Schanze (2013) Teaching Chemistry – A Study book pp 213-240.

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ANALYSISOF BODY MASS INDEX (BMI) OF B.N. BANDODKAR COLLEGE UNDERGRADUATE STUDENTS.

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ABSTRACT-

With the advent of technology and availability of ever growing variety of processed and convenience foods in the supermarket, the lives of all individuals across the world face a major challenge to maintain good physical and mental health. Malnutrition, unhealthy diet, infrequent fast food and alcohol consumption, smoking, drug abuse, long work hours on the laptop and computers, stress and so on, are the presentations of unhealthy life style that are dominant form in today's era. These multifaceted variables have a negative influence on health. Many studies show a link between BMI and the risk of several diseases as well as premature death in individuals. As BMI increases, so does the risk for diabetes, cardiovascular diseases,stroke,hypertension, gall bladder disease, osteoarthritis, sleep apnea and some forms of cancers also increase.Being overweight, underweight, and obesity have emerged as burning problems in the world. *BMI*, formerly called the Quetelet index, is a measure for indicating nutritional status in adults. The present research survey aimed to use BMI values as a screening tool to check the health status of randomly selected undergraduate students (age group 17 to 21 years) of B.N.Bandodkar College of Science, Thane. Efforts were also made to analyze, understand & predict from these values potential future health problems in these subjects.
Keywords: BMI (Body Mass Index), underweight, obesity, college students

INTRODUCTION-

Body mass index (BMI) is a measure of weight adjusted for height, calculated as weight in kilograms divided by the square of height in meters (kg/m^2).It is used to estimate a healthy body weight based on a person's height, assuming an average body composition, however it does not actually measure the percentage of body fat.
It is a simple, inexpensive, and noninvasive surrogate measure of body fat.It is a the recommended method for diagnosing overweight and obesity and can also be used for risk assessment.High BMI predicts future morbidity and death.Factors such as age, sex, ethnicity, and muscle mass can influence the relationship between BMI and body fat.

Obesity has become a serious body mass profile problem today (WHO 2004).

(W.G.D.S Wehigaldeniya et.al.) Scientists have become interested in measuring body fat percentage directly or by estimation using facilities and methods to evaluate body mass, especially on the sedentary individuals. One of these methods is the use of Body Mass Index (BMI).

In children and adolescents, associations have been demonstrated between BMI, or changes in BMI, and increased blood pressure, adverse lipoprotein profile, non-insulin-dependent diabetes mellitus and early atherosclerosis lesions.(http://ebook.ecog-obesity.eu)(2014). For children the interpretation of BMI is both age & gender specific.When BMI is below 18.5, weight status is considered to be underweight (UW), in between 18.5 – 24.9, it's normal/ healthy (H), when it's in the range of 25 – 29.9 Overweight (OW) & if above 30, person is Obese (OB) (www.cdc.gov; WHO, 1983). The values of BMI serve to be one of the reliable indicators of growth, health risks, diseases & body fatness.(Pathan Sabiha B Et Al.)

Table I – BMI Ranges (www.cdc.gov; WHO, 1983)

Thus, BMI it is used to assess how much an individual's body weight departs from what is normal or desirably ideal for a person of his orher height. The World Health Organization has used the BMI as the standard for recording obesitystatistics since early 1980s.(U. Franz Atare1 et al).The presentresearch about BMI is mainly focused on the relationship betweenBMI and physical health of college students.

METHODOLOGY

Enthusiastic students from Biochemistry Department collected the Primary data of height and weight of the studentsby random sampling. BMI was calculated using online BMI calculator for adolescents available on www.cdc.gov. Collected information was further analyzed scientifically. The data collected were arranged in line with WHO (2016) body mass classification chart and comparison was made for the proper interpretation.

RESULT & DISCUSSION

Chart I shows the analysis of height in feet, the average height was 5.4 feet with SD±0.45.

Chart II shows the analysis of weight in Kg, the average height was 56.73 kg with SD±13.51.

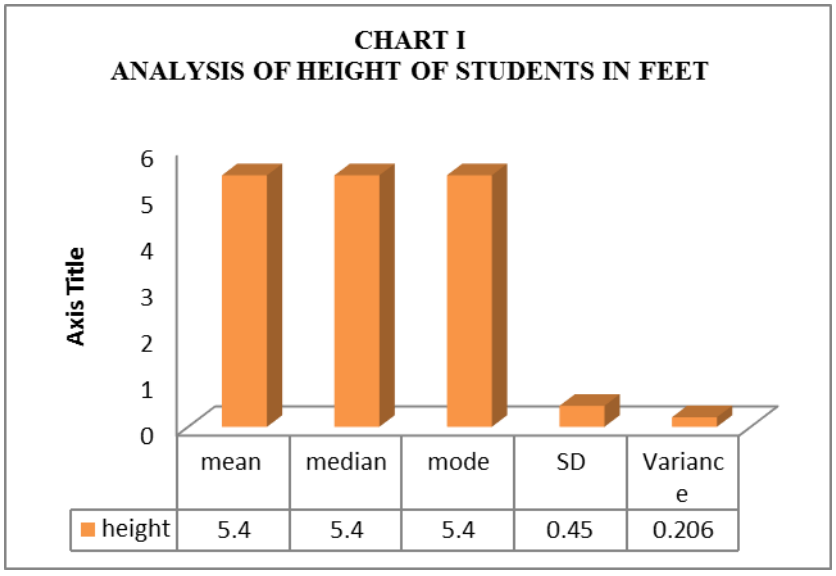
BMI is simply a numeric measure of a person's body thinness or thickness. The analysis of the data showed that 33% students were underweight, 53% has normal weight, 12% overweight and 2% obese.(chart III). From chart III , we can conclude that majority of students fall under the normal weight category.

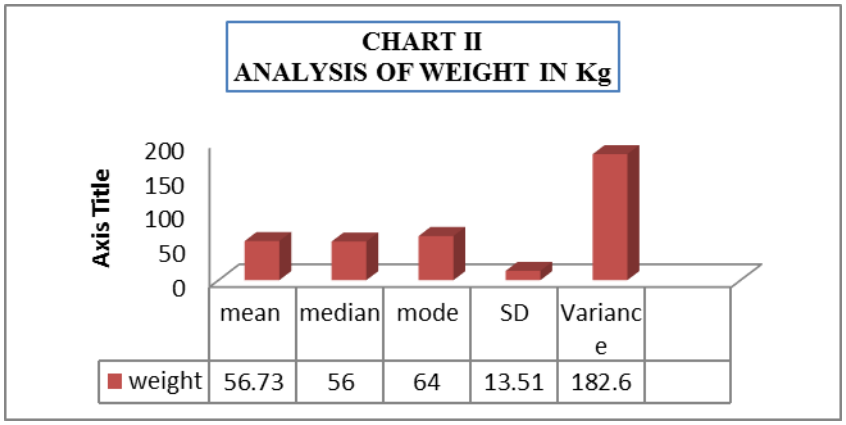
BMI	HEALTH STATUS
Below 18.5	UNDERWEIGHT (UW)
18.5 – 24.9	HEALTHY (H),
25 – 29.9	OVERWEIGHT (OW)
Above 30	OBESE (OB)

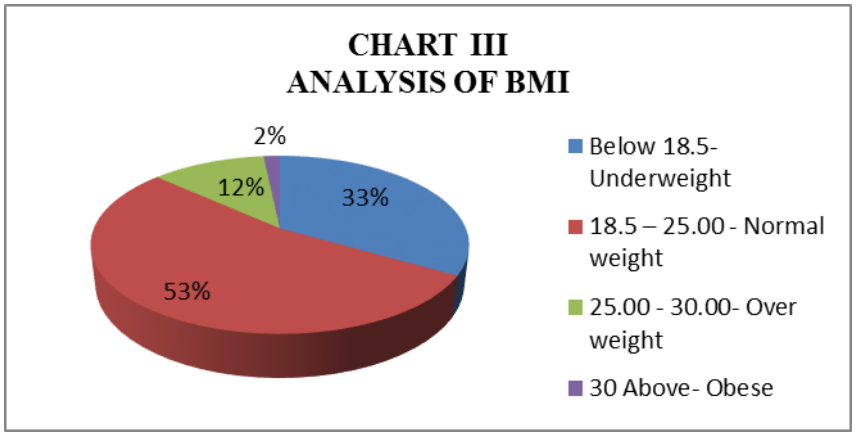
Chart IV shows the gender comparison as per the BMI ranges, 19 males and 13 females were healthy. So, we can conclude that more number of male students were healthy as compared to the female students.

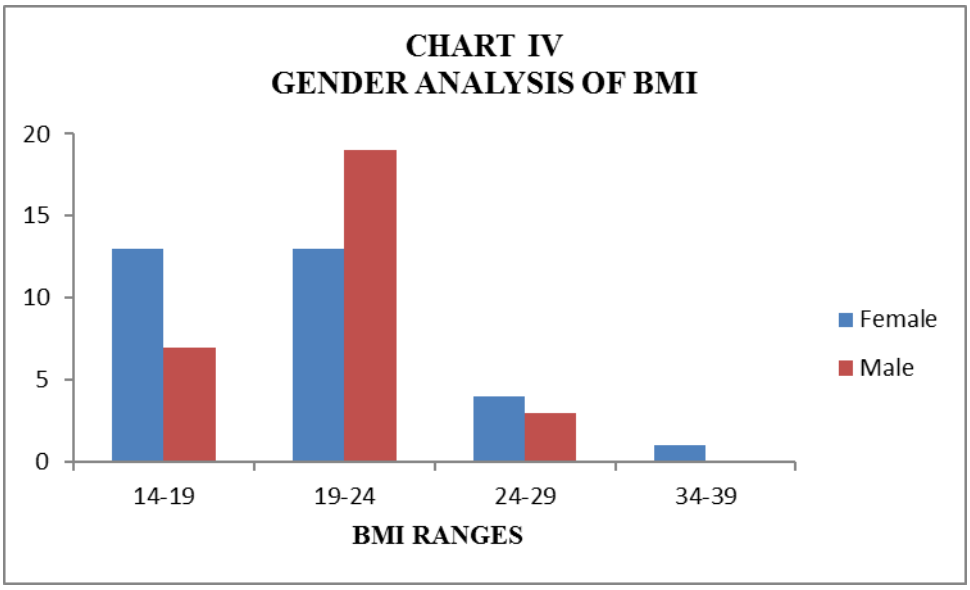
CONCLUSION

BMI screening information has helped to identify students who may be at nutritional risk as well as eating disorders, along with underweight, overweight, or obese category. Nutritional Counseling was given to the students to promote healthy eating and were encouraged to participate in physical activity and sports. It can be concluded that BMI is a simple and an effective primary measure for screening weight related issues amongst individuals and its possible health implications.









REFERENCES

Flegal, K. M., Graubard, B. I., William, D. F. & Gail, M. H (2005). Excess deaths associated with underweight, overweight and obesity. *Journal of American Medical Association (JAMA), 293*(15), 1861-1867

Gaohua Li (IWCSS 2013)The Research of Relationship Between BMI Classification and Physical Function of Male College Students International Workshop on Computer Science in Sports.Ppage 5-7. http://ebook.ecog-obesity.eu/wp-content/uploads/2014/12/ECOG-Obesity-

eBook-Article-4.1-History-and-Meaning-of-the-Body-Mass-Index.pdf

PATHAN SABIHA B., SHAH NEHAL D. & DHOLAKIA ARUN H. A study of bmi & health status of adolescent girls (age groups 13 to 18 years) of surat city. February 2012 Conference: XXVI Gujarat Science Congress 2012.

U. Franz Atare1 & Nkangude A. T(2014) Body mass index and academic performance of undergraduate university students .*Asian Journal Of Management Sciences & Education* Print Vol. 3 No. 1, 105-112.

W.G.D.S Wehigaldeniya, P.A.L Oshani, I.M.N.S Kumara (2017) Height, Weight, Body Mass Index (BMI) and Academic Performance (AP) of University Students in Sri Lanka: With Special Reference to the University of Kelaniya. International Journal of Scientific and Research Publications, Volume 7, Issue 2, 217 ISSN 2250-3153.

S Stenholm, J Head, V Aalto, M Kivimäki, I Kawachi M Zins, M Goldberg, LG Platts , P Zaninotto, LL Magnusson Hanson, H Westerlund and J Vahtera (2017) Body mass index as a predictor of healthy and disease-free life expectancy between ages 50 and 75: a multicohort study. International Journal of Obesity 41, 769–775.

http://dhss.alaska.gov/dph/wcfh/Documents/school/assets/MeasuringBMI.pdf

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AN ATTEMPT TO ISOLATE ANTIBIOTIC PRODUCERS FROM ANTIBIOTIC RICH ENVIRONMENTS

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ABSTRACT:

Emergence of antibiotic resistant bacteria is a prevalent problem for mankind. The number of bacteria acquiring antibiotic resistance is increasing at an alarming rate. Hence there is a dire need for isolating novel bacteria producing novel antibiotics.

Only a fraction of the total diversity of bacteria can be cultivated in the lab. This is because the environmental conditions required for the growth of these bacteria cannot be simulated in the laboratory. Because of the limited availability of cultivated bacteria for further studies, there has been a downfall in the isolation of novel antibiotic producers.

Current study aimed at isolating yet uncultivated bacteria from water bodies and effluent samples having high antibiotic concentrations, capable of producing novel antibiotics against MRSA. Specially designed dilute media simulating natural environment for isolation of yet uncultivated bacteria followed by Wilkin's agar overlay technique was employed for this purpose. However, no notable antibiotic production against the strain of MRSA was obtained.

Keywords: Antibiotic Resistance, yet uncultured bacteria, MRSA

INTRODUCTION:

Antibiotics are the chemical substances produced by fungi, Actinomycetes and bacteria that kill or inhibit the growth of other microorganisms, and therefore are used to treat infections in humans and animals. Antibiotics have been and are being used to treat various infections like leprosy, cholera, tuberculosis, pneumonia etc. and play a pivotal role for patients undergoing chemotherapeutic treatments and complex surgeries. In natural environments, microbes release antibiotics to kill other microorganisms and thus have an upper hand in the biological competition.

Antibiotic resistance is emerging rapidly, posing a serious problem, as effectiveness of antibiotics to kill or inhibit the growth of pathogenic bacteria is decreasing. Overuse of antibiotics, wrong choice of antibiotics and prolonged treatment using antibiotics are few reasons for rapid emergence of antibiotic resistance. Bacteria which are resistant to many drugs are called as multidrug resistant bacteria or superbugs. Methicillin resistant *Staphylococcus aureus* (MRSA) is one example of MDR strain which has acquired resistance to many drugs including tetracycline, erythromycin, clindamycin hydrochloride and sulfamethoxazole. Microorganisms which are susceptible to particular concentration of antibiotic can develop different mechanisms and tolerate that concentration of antibiotic

to which they were susceptible earlier. The most common mode through which bacteria gain antibiotic resistance is via Horizontal Gene Transfer (HGT) (Gyles and Boerlin, 2014)

The threat posed by antibiotic resistant bacterial strains is that, many curable infections like pneumonia and urinary tract infections (UTI's) would become incurable. Infections caused by resistant bacteria could be resistant to one or more antibiotics (Jawetz, 2013). Many cases of resistance to last resort drugs like Carbapenem and Colistin have been reported. In the foreseeable future all the existing bacteria would become unresponsive to the existing antibiotics. To solve the problem of antibiotic resistance there is dire need to discover new antibiotics which are effective against superbugs. Most of currently used antibiotics are derivatives of first generation antibiotics; therefore gaining resistance becomes easier for bacteria.

The microbial world is the largest unexplored reservoir of biodiversity on the Earth. Out of the three primary phylogenetic domains – Archaea (archaebacteria), Bacteria (eubacteria) and Eukarya (eukaryotes), the bacterial domain is the least understood in terms of its diversity, physiologies and ecological panorama (Woese et al., 1990). Current, evidence suggests that there may be 3,00,000 to 1 million bacterial species on the earth, yet only 3,100 are described in Bergey's Manual (Report of a workshop held at Michigan State University, sponsored by Bergey's Manual Trust). The term "The great plate count anomaly" was coined by Staley and Konopka in 1985 (Staley and Konopka , 1985) to describe the difference in orders of magnitude between the numbers of cells from natural environments that form colonies on agar media and the numbers countable by microscopic examination. One explanation for the "great plate count anomaly" is that many of the microbial species that dominate in natural settings are not adapted for growth in media containing high concentrations of complex organic carbon. Many microorganisms may need oligotrophic or other fastidious conditions to be successfully cultured. There are many examples of microbial strains that are common in nature, but can only be cultivated by specialized techniques (Stewart, 2012).

The uncultured /uncultivable microorganisms, with their genetic and biochemical diversity, may emerge as a major source of new natural chemical structures that may be useful for mankind. Fraction of this yet uncultivated bacterial diversity might also be responsible for producing novel antibiotics, which can act against MDR strains.

In January 2015, Ling et al. isolated a novel, yet uncultured antibiotic producing organism named *Eleftheria terrae* from soil which produced new antibiotic 'teixobactin'. *Eleftheria terrae* was earlier unculturable under laboratory conditions. To isolate these uncultured bacteria, a multichannel device-iChip was used, which was placed in soil to simulate natural environment. Diffusion of nutrients and growth factors through the chambers from soil enabled growth of uncultured bacteria. The novel antibiotic teixobactin was reported to inhibit cell wall synthesis by binding to highly conserved motifs. Teixobactin discovery highlighted the importance of novel antibiotics from yet

uncultivated bacteria from natural environments that are likely to avoid development of resistance.

Various water bodies are known to have high concentrations of antibiotics due to various factors, including untreated effluent discharge from antibiotic producing industries. Majority of bacteria present in such samples, having high concentrations of antibiotics, are known to be multi drug resistant, or acquire multi drug resistance rapidly. We hypothesize that some bacteria present in this population might be producing certain novel antibiotics in order to survive under high antibiotic stress conditions and sustain in the competition. Current study aimed at isolating yet uncultivated bacteria from such samples having high antibiotic concentrations, capable of producing novel antibiotics against MRSA.

MATERIALS AND METHODS:

Procurement of samples:

Samples were collected from different sites in a sterile container and stored at 4°C until further use.

Determination of pH:

pH of samples was checked using pH paper.

Preparation of media:

In order to prepare dilute media simulating the environment, 0.013 gm of nutrient broth powder (HiMedia) and 10 ml of sample were added to 90 ml of D/W and sterilized by autoclaving. Semi-solid media of similar composition were also prepared by adding 2.5% agar agar (HiMedia).

Enrichment and isolation of antibiotic producers:

The sample **(**5 ml) was added to 50 ml of enrichment medium and incubated for 2-3 days until turbidity was observed. It was then serially diluted tenfold using sterile saline. Diluted samples (0.1 ml) were plated on dilute media simulating the environment by spread plate technique to obtain well isolated colonies. All the plates were incubated at room temperature until bacterial colonies were observed.

Wilkins Agar Overlay:

Fifty micro litre of MRSA (A_{540} 0.1) was added to 10 ml of sterile molten Wilkin's agar (HiMedia), mixed and overlayed on select plates with well isolated colonies. The plates were incubated for 10-15 days at 37ºC until a zone of inhibition against MRSA was observed.

RESULTS AND DISCUSSION:

Water bodies and effluent samples expected to have high concentrations of antibiotics were used in present study to isolate novel antibiotic producers against MRSA. Table 1 enlists different samples collection sites used in current study. Samples from Diva creek, Thane creek, Ulhas river and Dombivali creek were collected, as there have been various reports that multiple industries including a few antibiotic industries release their effluents into these water bodies (Singare and Dhabarde, 2013). A sample from Sundarban was also used, as presence of antibiotic resistant bacteria in the microbial flora of the Sundarbans mangroves has been reported (Asif et al., 2017). Khandelval laboratory effluent and sample from Common Effluent Treatment Plant is expected to have effluent from antibiotic producing industries.

Hundred times diluted nutrient medium to simulate natural environment was used for enrichment and isolation of bacteria because in natural environment concentration of nutrients might be low, thus to avoid

nutrient shock dilute medium was used. Identification of antibiotic producing bacteria was done by using Wilkins agar overlay method. Wilkins agar consists of Bromothymol blue which is pH indicator dye, in acidic condition it is yellow and in basic condition it is blue. Thus, it helps to determine whether the zone of inhibition is because of an antibiotic production or due to acid formation (Casida, 1968).

Table 1 Collection sites for different samples

Sample No.	Sample Collection site
Sample 1	Thane Creek
Sample 2	Khandelval lab effluent
Sample 3	Common Effluent Treatment Plant
Sample 4	Ulhasnagar Lake
Sample 5	Soil sample from Sundarbans
Sample 6	Dombivali Creek
Sample 7	Badlapur Creek
Sample 8	Kalher

Since pH of the sample would play important role in isolating novel antibiotic producers, pH of sample was noted as depicted in Table 2.

Table 2 pH of samples after procurement:

Sample No.	pH
Sample 1	7.0
Sample 2	5.5
Sample 3	7.0
Sample 4	5.0
Sample 5	7 .0
Sample 6	6.0
Sample 7	6.5
Sample 8	8.5

High concentrations of nutrients used in conventional cultivation attempts may inhibit a large number of micro organisms, as many natural microbial communities flourish in oligotrophic conditions. Indeed, reports have indicated that the use of low concentrations of nutrients has increased microbial recovery. Simulation of natural environment has been another approach to culture the uncultured (Stewart, 2012). Inclusion of sample in the medium is expected to provide nutrients and/ or signaling molecules and help culture the uncultured micro organisms. Both these approaches have been used in present study to enrich and isolate yet uncultured bacteria in the sample.

'Enrichment' is a conventional technique in Microbiology that provides conditions selective for organisms of interest and counter selective for all others. Enrichment in dilute media simulating the environment is expected to increase the population of bacteria that dwell the environment but cannot grow on conventional media due to nutrient shock and/ or slow growth rates.

After enrichment, agar media of similar composition were used to isolate bacteria in the sample by Serial tenfold dilutions and spread plate technique. Wilkins agar seeded with MRSA was overlaid in order to check if any of the isolated colonies gave a zone of inhibition against MRSA. Overlay of Wilkin's agar with test culture on media plates having potential antibiotic producers is a widely used simple primary screening technique. Wilkin's medium contains pH indicator dye bromo-thymol blue which is green in colour at neutral pH, but turns yellow at acidic pH. Thus one can

differentiate antibiotic producer from acid producer. Those colonies that produce antibiotics give zone of inhibition against sensitive organisms (MRSA in current study) without changing colour surrounding it while in case of acid producers yellow coloration of medium is observed.

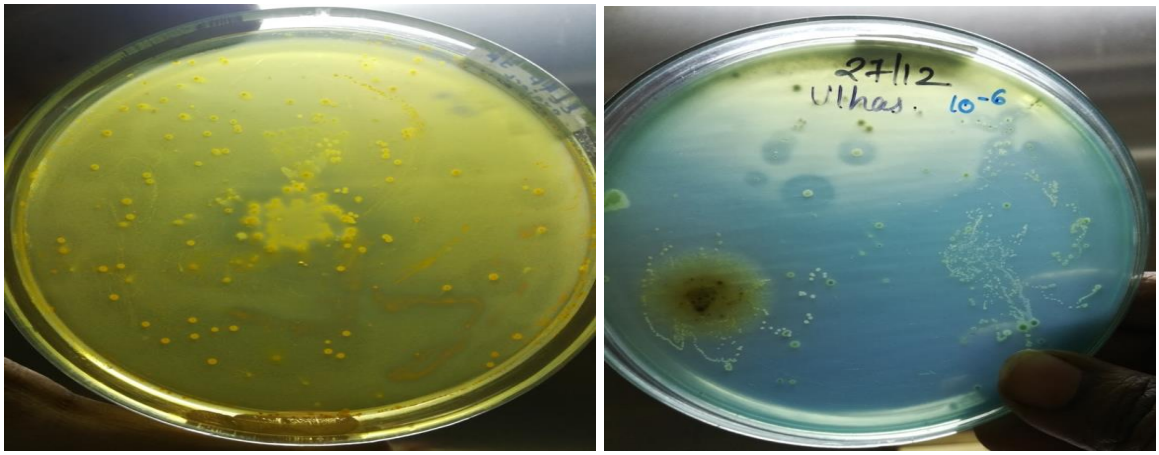
In case of sample 1, 10^{-4} dilution showed a crowded plate which was not of significance whereas, higher dilutions showed well isolated colonies. After Wilkin's agar overlay, the media did not show any colour change indicating that there weren't any acid producing organisms in the sample. One colony showing a slight zone of inhibition could be producing an antibiotic or a compound that wasn't strong enough to inhibit the growth of MRSA, and further testing should be done where inhibition of another non-resistant organism can be checked.

For sample 2, no growth was observed on plates of higher dilutions, as maybe the sample initially itself contained less number of organisms. Since the sample was too diluted, lower dilutions were used for spread plating. Colour change of media to yellow indicated that either the organisms growing were acid producers or because the sample itself was acidic in nature.

For sample 3 and 5, both having neutral pH, since there was a colour change of the media to from blue to yellow colour, the zones observed on the plates were due to acid producing organisms and not antibiotic producing organisms.

In case of sample 4, colour change of media could be due to acid producing organisms or due to the acidic nature of the sample. Upon further testing it was noticed that the zones of inhibition on the plate were due to an aerial contamination and not due to organisms present in the sample.

Figure 1 Observations after Wilkins agar overlay of Sample 3 and 4 respectively.



For Sample 6, all three dilutions gave crowded plates. Therefore, the sample should be diluted further before performing spread plate. No colour change of the media and no zones of inhibition were observed.

In both Sample 7 as well as Sample 8, no zones of inhibition and no colour change of

the media after Wilkin's agar overlay was observed.Antibiotic producers would ideally give a zone of inhibition against the MRSA present in the Wilkins agar that was overlaid, but such results weren't obtained with any of the samples and therefore the project yielded an overall negative result. There could be various reasons for negative results. It is possible that the organisms present in the water sample couldn't grow under stringent laboratory conditions as they don't mimic their natural environment and abiotic factors (like pH, oxygen concentration, humidity etc.) in which they were growing.Since isolation of organisms only on dilute nutrient mediawas tried, maybe the antibiotic producing bacteria were unable to grow on this media as it lacked certain nutrients that were essential for their growth. Therefore, isolation can also be tried on conventional nutrient media along with certain changed conditions of pH etc. Since a natural sample was used, there is a chance of the antibiotic producing organism growing in synergy with another organism and only one these synergistic organisms were isolated, due to which that organism wasn't able to grow on the nutrient media plate. The isolated organisms were tested only against pathogenic MRSA strains. But there

Table 3 Results of isolation of antibiotic producers and its confirmation for different samples

Sample	Results after spread plate	Results after Wilkins agar overlay
Sample 1	10-4 dilution showed crowded plate. Higher dilutions showed isolated colonies.	No colour change of media after. Slight zone of inhibition observed on 10-6 plate. But on further testing the colony did not inhibit the growth of MRSA
Sample 2	Micro colonies were observed on 10-4 dilution plateand no growth on higher dilutions.	Colour change of media from blue to yellow. No zones of inhibition observed on any plate.
Sample 3	Well isolated colonies were observed even on 10-4 dilution.	Colour change of media from blue to yellow, therefore the zone observed was due to acid producers.
Sample 4	10-6 dilution showed isolated colonies whereas lower dilutions showed crowded plate.	Colour change of media from blue to yellow. Zone of inhibition observed due to aerial contamination.
Sample 5	10-4 dilution showed crowded plate.	Colour change of media from blue to yellow. No zone of inhibition observed.
Sample 6	All three dilutions showed crowded plates.	No colour change of media. No zone of inhibition observed.
Sample 7	10-4and 10-5 dilutions showed crowded plate.	No colour change of media. No zone of inhibition observed.
Sample 8	10-5 and 10-6 dilutions showed well isolated colonies.	No colour change of media. No zone of inhibition observed.

is a possibility that the antibiotic producing bacteria only produce antibiotics against the natural flora in the sample to survive in the competition; rather than the strain of MRSA used in present study.

Chances also are that the antibiotics being produced aren't broad spectrum and only targeted against those particular organisms in order to eliminate competition.Since spread plate technique was used, only the presence of aerobes and facultative anaerobes that may produce antibiotics waschecked. But there is a high chance that the antibiotic producing bacteria may be an obligate anaerobe as the effluent samples are usually carbon dioxide rich and oxygen deficient.

Further attempts for isolating novel antibiotic producers against MRSA could be made with these modifications in the protocol.

REFERENCES:

Asif, A., Mohsin, H., Tanvir, R., Rehman, Y. (2017). Revisiting the Mechanisms Involved in Calcium Chloride Induced Bacterial Transformation. *Front. Microbiol*, *8*:*2169*.

Casida, L. E. (1968). *Industrial microbiology*. New York: Wiley publications

Gyles, C., Boerlin, P. (2014). Horizontally transferred genetic elements and their role in pathogenesis of bacterial disease. *Veterinary Pathology.* 51 (2): 328–340.

Jawetz, Melnick, Adelberg (2013). *Medical Microbiology*:The McGraw-Hill Companies.

Ling L. L., Schneider T., Peoples A.J., Spoering A.L., Engels I., Conlon B.P. (2015). A new antibiotic kills pathogens without detectable resistance. *Nature,* 517:455-9.

Sarkar, P., Bhagavatula, S., Suneetha,V. (2014). A Brief Research Study on Novel Antibiotic Producing Isolate From VIT Lake, Vellore, Tamil Nadu. *J App PharmSci*, 4(01): 061.-065.

Singare, P. U, Dhabarde, S. S. (2013). Studies on Pollution due to discharge of effluent from Pharmaceutical Industries of Dombivali Industrial Belt of Mumbai, India. *International Letters of Chemistry, Physics and Astronomy, 3*:16.-13.

Staley, J. T. and Konopka A. (1985). Measurements of *in situ* activities of nonphotosynthetic microorganisms in aquatic and terrestrial habitats. *Annu.Rev. Microbiol.*, 39:321–346.

Stewart, E. J. (2012). Growing Unculturable Bacteria. *Journal of Bacteriology,* 194(16): 4151–4160.

Woese, C. R., Kandler O. and Wheelis M. L., (1990). Towards a natural system of organisms: proposal for the domains Archaea, Bacteria, and Eucarya. *Proc. Natl. Acad. Sci. USA,* 87:4576–4579.

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CURRENT SCENARIO OF EDUCATION – HOLISTIC ETHICAL PERSPECTIVE

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Abstract

The power of knowledge, unserved by personal profits and agendas can help eradicate the tons of misconceptions. By holding one another one can promote a harmonious world. The aspects of holism interwoven in the fabric of ethics that weaves together in the institution of education. Therefore, present article highlights the importance of being ethical in the noble field of education for all-round development of the child in relation to not only good professions but also good human beings. The paper analysis various philosophical models and ideologies put forth throughout history and some implications and applications.

Keywords: *education, holistic, ethics, inclusiveness*

INTRODUCTION

Every aspect of the human life is multi-faceted, multi-dimensional and is characterized by shades of grey. By definition, holism refers to "the theory that parts of a whole are in intimate interconnection, such that they cannot exist independently of the whole, or cannot be understood without reference to the whole, which is thus regarded as greater than the sum of its parts." In this definition, one might note the emphasis on the fact that it is considered potentiality impossible for anything to be taken individually, by itself and out of context.

India is predominantly a collectivistic society, where people get their identity from their surnames, these surnames further act as identity markers for caste, religion, place of residence, at times even occupation.(Kurian, O. (2015, April 02 Lobo, S. (2018, August 02).). Similarly, for a doctor to diagnose exactly what is wrong with the patient has to ask their personal medical history, the family's history and also keep in mind the environment and probable viruses in the air. Failing to consider any of this could result in a fatal loss or either a limb or of life. Therefore, this paves the way to the first aspect covered in this paper, that is, the disadvantage of streamlining education in such a way that specialization might actually result in incompetence or less competence.

In the noble field of education, the power of knowledge, holding one another giving moral support, motivation in the field can promote a harmonious world. Therefore, Ethics is defined as "moral principles that govern a person's behavior or the conducting of an activity." while theoretically it may seem that holism and ethical functioning are not really connected.

For the all-round development of the child, grades, good professions and good human beings shall be main motto of education by focusing on their mental, physical, and psychological development. It is societies

responsibility as being people in the education field to start the wave whereby the goal of life is not to earn money, but rather to be happy with oneself and be the best version of themselves. (Balotsky, E. R., & Steingard, D. S. (2006).

Using past research explaining the interplay between ethics and holism

To understand the importance of holistic ethical learning, development of moral decision making helps to decide ethical and non-ethical terms. The moral development in humans happens as a process stretched over a 7-stage continuum. The lowest level is of moral understanding begins with stage one and the last level is a rare level of moral judgment.

Today operate in a world where the trend is to bifurcate real-world experiences and spiritual development which hazardous to our sustenance caused by this spiritual dissociation or "metaphysical blindness" .The loss of "spiritual intelligence" has given rise to a fashion of "progress" that is based on decisions that are focused on material growth, ego centrism and lack of humanity.

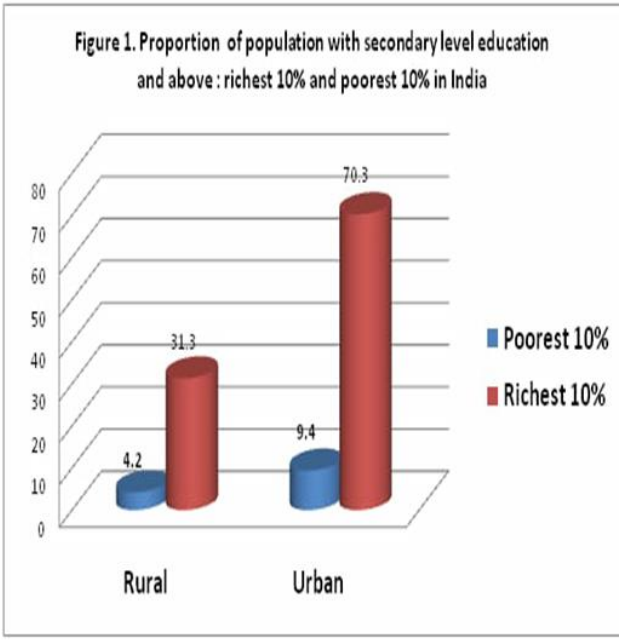
In the last 2 decades, some educational institutions have seeped into this view of functioning, losing the sanctity and nobility of this field. Enron characterized the current mentality of business as "economic high performance supersedes moral performance". It is advised that ethics are a product of the "realm of spiritual" therefore the two concepted are more intertwined than society believes. It is important to note that the paper does not aim to prove that all humans are unethical and biased, in fact one of the major reasons that society face such a shortage of ethical beings because it is assumed that humans are ethical, inherently good and work in the favour of not just their benefit but also those around them. Due to this assumption, the lack of articulation of ethical measured gave rise to an increase of ethical ambiguity. Usually all professionals like theologians, chemists, physicists, biologists, philosophers, psychologists, sociologists, economists and anthropologists try to break down the workings of the society, world, and universe to its fundamental pillars, and in the process the end up breaking our understanding like shattered pieces of glass. Therefore, this shows that the breakdown of science and spirituality, that is the decline in the importance of holism has in turn led to a society free from ethics. It proved that justice and rationality are not singular constructs, they require context to make sense. If one can take any of our moral dilemmas like in a break-failed train, would it kill a child praying on the tracks that are never used or would it kill 5 grown men working in the route of the train. "modernity pluralizes" presenting us a buffet of choices making many rights. However, recently, the wide plethora of choices offered has led to seeing these ethical considerations as bondage, thus raising the flag of liberalization. Bacon, Locke, Hume and Mill see these choices as a reason as a road towards liberalization from the oppressive nature of moral values. (Balotsky, E. R., & Steingard, D. S. (2006).

People showcase it as freedom from the exploitation of religion and state, in turn promoting free will to do whatever each believes to be ethically correct, in their own perspective. Ethics were now understood as an issue of personal choice of each individual, blurring the lines of all good and bad, and giving rise to a grey murky field for

all to use as they seem fit based on their whims and fancies, thus nullifying the initial premise that all humans are inherently good and would act in ways that have a greater good rather than their personal good.

Current scenario of education, with respect to loss of ethics and holism.

Education is the foundation of building ethical individuals and from a behavioural psychological perspective, it can be understood that if one punishes a child for being wrong, and the next the child lies and escapes the punishment, the child is likely to continue lying to avoid the harsh beating, thus reinforcing lying or other such unethical practices. Therefore, it is important to see students as individuals who are capable of both good and bad, but the path that they choose depends upon various factors like how do the parents react, do children have the scope to learn from their own mistakes, does making a simple mistake mean the loss of parental affection, etc. Keeping this in mind the paper proceeds to the 3 major areas from a long list where the field of education could benefit from ethical holism.



1. Streamlining of streams

Teaching and learning methodologies are different in colleges as well as in school also the understanding of children. They flourish better in a self-directed pattern of teaching rather than the spoon-feeding nature of primary school life. Educators in the beginning of the 20th century took help from the work of John Dewey (1910; 1938; 1944) work to use education as a way of building a responsible citizenship that inhabits a democratic society, thus developing their ability to discern right from wrong and placing faith in their ability to decide. Eduard Lindeman (1961) modified the assumption that "education is preparation of life" to "education is life" and established a relationship between the need of catering education to situations rather than subjects,

and believed that the "highest value in adult education if the learner's experience" (Graham, P. G. (2001).). Imam Ali once said that to win a battle He would much rather depend on the experience of the old than the strength of the young. Lindeman further emphasizes the importance of developing a student's power to be creative, understand freedom (that is the duties that come with rights) and the art of self-expression.

Therefore, courses like Human Science or Interdisciplinary Science, or the practice of liberal arts where students not only specialize in one topic but simultaneously choose topics from social sciences, natural sciences, humanities, etc. Therefore, the suggestion here to include not only practical hands-on experience as an essential part of education but also a possibility to choose variety of subjects that one is interested in instead of having 4 major streams of arts, commerce, science and engineering. A good doctor also needs to be empathetic enough to convey the news of a fatal disease in a compassionate way along with knowing his subject. (Sharma, B. (2014, April 22).

Along with measuring intelligence quotient and emotional quotient we now have something known as social quotient which helps determine people's capacity to handle relationships, function in group settings and facilitate a group by being a leader or a motivator as one sees fit. Similarly, a psychologist needs to know about the chemistry and biology if he/she were to have a client from that field, to better understand and help them through. Similarly, every human being has a possibility of being in an accident, for such a scenario, at least a basic level of first aid proves necessary to be known by all. The benefits of music in healing have been researched a large number of times and it could only be after an achieving education from a wide spectrum of topics can one know what is out there and how can he/she use it for the profit of themselves and those around them.

2. The goal of education is self-sustaining satisfaction of life

Much associated to the first point, the idea of education today is limited to nothing but being able to get a good job, earn enough money even at the cost of sacrificing their own happiness and wellbeing. Until now student was only assessed on their memory capacity, and collecting information from various sources, paying very little attention to creativity and out of the box thinking, concentration, imagination. Similarly, "how much do you earn?" is a much widely asked question rather than "are you happy?" While it is obvious that happiness does not fill empty stomach, does the stacks of currency notes in our bank accounts help us feel emotions like happiness, love, warmth, pride, confidence, etc?

According to the integral education system given by Sri Aurobindho it is the spiritual progression of the student which is given the utmost importance. In the same way, Rabindranath Tagore believed that the goal of education is to promote the fullest development of a person's soul, while Swami Vivekananda said that education has the chief aim of making a true man. Thus, Sri Aurobindho's way of education would cause a social change with spiritual evolution as the basis. Thus, as opposed to

getting involved in the rat race, students would instead focus on the real fabric of their being. It is important to look at a student from the lens of not just his/her marks but also their ideas, beliefs, principles, experiences, perceptions towards life, the value of relationships, the ability to bounce back, the ability to do something instead of just talk about it, the ability to stand for what they believe in rather than simply go with the flow, the ability to say wrong in the face of wrong, and the ability to stand up for someone who is being tortured unjustly. (Sharma, B. (2014, April 22).

From the classical Indian perspective, education is an exercise to bring out the innate spiritual qualities and empower man to do as his spiritual inner self believes. Integral education believes that "nothing can be taught" thus expressing that education is not delivering mere facts but rather to enable the student to become aware of his/her potential and then provide the necessary tools for the student to actualize their potential.

Social setting plays an important role in learning and put forth self-authorship which showed the students that in every situation there can be more than one right answer. Besides such cognitive skills, even psychomotor skills explained by different theories with imitating in behaviors of models. The belief that one has the capacity to do something influences the effort, learning as well as persistence. These models help explain that learning is not limited to audio-visual or rote learning based but an area with a vast arena open for the educator to explore. The purpose of using such techniques is to move the importance from marks to learnting , understanding which is benefited to the society. (Datta, H. (2011).

The four-domain development diagram (4DDD) (Vanasupa, 2009) was given to explain the role played by the environmental factors like culture, history to promote a social as well as affective and cognitive development. The model puts forth a treasure of ways that could help in a holistic development of the students. Likewise, Sir Ken Robinson talks about how today degrees are not worth much. Until the last century, a degree ensured a job, however during the last 2 decades, the value of a bachelors is reduced to that of an SSC exam passed student. This is known as academic inflation, indicating that education is evolving and it's time we catch up to it. (Vanasura, L., Stolk, J., & Herter, R. J. (2009).

Therefore, the purpose of education is to keep the sparkle of wonderment burning in the eyes of the students, to make them ask the questions that really matter, to understand the goal of learning. The children need effective stimulus which can make the beauty of the child bloom, and that spring will only come if one puts comfort over sustainability. The lack of holistic development of students has resulted in an epidemic, where grades become the child's identity.

3. Ignorance is not bliss

The paper further examines the various ways in which discrimination in the education field is still prevalent. The four major areas of discrimination are caste, religion, gender and class. Just 4 months ago a school in Tamil Nadu was found to discriminate among students on the basis of their caste.(Lobo, S. (2018, August 02).) Students belonging to the lower castes were

made to sit separately. Similarly, in 2014 in Delhi students from the families of Dalits, tribals and Muslims saw rampant discrimination. A society are building by teachers and schools are considered as the torch-bearers of enlightenment and change act in ways that are inhumane and derogatory. The year 2010 saw the death of Professor Ramchandra Siras, a professor of Marathi, because the university suspended and insulted him for being a homosexual. Correspondingly, there are unethical practices carried out in the education field where various instances of teachers taking credit for the work of students are reported. While it is acknowledged and accepted that there is no magic pill to solve these issues and there are some rotten apples in every basket, the suggestion here is to increase education, and to use knowledge as a tool to bring people closer. Harmony in this age of divide is one of the major goals of education. Prejudices, biases and misconceptions can only be killed by promoting the spread of knowledge. Today in the day and age of such easy access to information, it seems easier and logical that we use it to lower our defenses and understand and more importantly accept one another rather than 'tolerate' each other.

CONCLUSION

The preservation and advancement of society depend on group learning which develop more effective way of living together. There are goals of effective holistic ethical education is to enable the learner –

-To achieve a degree of happiness and meaning in life,

- To better understand oneself, his/her strengths and weaknesses and his/her relationships with the people around him

- To realize the need for life-long learning, helping to eradicate falsehood and misrepresentations that may be proposed for the vested interest of a few.

-To facilitate environments and opportunities -To enable the learner to advance in the maturation process spiritually, culturally, physically, politically, and vocationally.

-To provide the learner with a variety of knowledge and skills which would prove as an advantage over the specialization system.

REFERENCES:

Balotsky, E. R., & Steingard, D. S. (2006). How teaching business ethics makes a difference: Findings from an ethical learning model. *Journal of Business Ethics Education, 3, 5-34.* Retrieved from https://search.proquest.com/docview/886546282?accountid=28682

Datta, H. (2011). A study on Sri Aurobindo and his integral education some aspects. *Shodhganga*. Retrieved from http://shodhganga.inflibnet.ac.in/bitstream/10603/162129/5/05_chapter%201.pdf .

Graham, P. G. (2001). Issues of ethical complexity for adult educators in business-oriented organizational learning settings in the united states. *ProQuest Central.* (251786849). Retrieved from https://search.proquest.com/docview/251786849?accountid=28682

Kurian, O. (2015, April 02). When schools continue to exclude, can education reduce caste discrimination in India? *Oxfam India.* Retrieved from https://www.oxfamindia.org/blog/when-schools-continue-exclude-can-education-reduce-caste-discrimination-india

Lobo, S. (2018, August 02). Principal of govt school accused of caste discrimination, parents lay siege to school. *India Today*. Retrieved from https://www.indiatoday.in/india/story/principaldiscriminationparentslaysiegetoschool130366120180802

Sharma, B. (2014, April 22). 'Rampant discrimination' in India's schools. *Aljazeera*. Retrieved from https://www.aljazeera.com/indepth/features/2014/04/discrimination-india-schools-20144221230392764 70.html

Vanasura, L., Stolk, J., & Herter, R. J. (2009). The four-domain development diagram: A guide for holistic design of effective learning experiences for the twenty-first century engineer. *Journal of Engineering Education, 98(1), 67-81*. Retrieved from https://search.proquest.com/docview/217950281?accountid=28682