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Trends in Mathematics towards Enriched Society Today

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Abstratct – This paper makes an attempt to study a role of mathematics as the current thinking of collaborative approach to inter-disciplinary trends towards enriched society in the 21st century. It begins with trends of applications of the 20th century bridging the line of inter-disciplinary research. It tries to address the changes in mathematics applications as a result of the modern approach to mathematics and discoveries in other fields such as computer, socio-economic, medical science, biological science, industries, business, environmental sciences, etc. The paper also highlights what are the hindrances in bridging the Integrated Knowledge towards enriched society; suggesting Fuzzy Mathematics as a new area where mathematics is emerging as vital trends with greater opportunities for inter disciplinary research.

Keywords: Trends in mathematics, inter-disciplinary mathematics, Fuzzy Mathematics, Integrate knowledge towards enriched society.

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1. INTRODUCTION

Trends in mathematics and their influences on human society are numerous today. People do not realize that they are using mathematical reasoning, ideas, concepts etc. directly or indirectly in day today life. Almost all areas of human activity have been enriched by the influence of maths. For examples, uses of computers and mobiles have fairly broadened the applications of mathematics. In educational fields, industrial fields, business fields, medical fields, transportation analysis, socio-economic analysis, socio-political studies etc. people are using all branches of mathematics, not just traditional applied mathematics. In recent years, mathematical practices such as analysis, implementations, schooling, accessibility have been evolving a lot. Many new forms of mathematical activities like algorithms and programming, modelling, conjecturing, expository writing and lecturing are some of the significant uses.

2. TRENDS IN TWENTIETH CENTURY

Twentieth Century made human society to rethink on the foundations of mathematics. David Hilbert's dream (1862-1943) was to examine axioms and the effects of each subject as a whole. In the 1930s his dream became possible by establishing axiomatic algebra method. A similar trend took place in functional analysis with Banach Spaces which set a trend to other subfields of mathematics like partial differential equation, harmonic analysis and algebraic topology. Thus the 20th century inspired researchers and mathematicians to enter into remarkable discoveries in other applied sciences. As a consequence, mathematicians at the end of the 20th century rethought the need to connect divisions within math (pure and applied mathematics) so as to open up science of learning more inter-disciplines and to further encourage the line of work through inter-disciplines. Hence the current search is to streamline the past and future with healthy interactions and with creative research works to enrich further and to stabilize the 21st century (today). This way the drives of 20th century in search of generality become more diverse, more structured and more complex.

3. TRENDS THAT HINDER ENRICHMENT OF SOCIETY (DEVELOPMENT) IN INDIA

Following are the trends that hinder the integrated knowledge towards Enriched Society:

- Indian academics refuse to upgrade their areas of study. From one field of inquiry to another, they don't "move." The area you pick is the sector you research before you

withdraw. Mathematicians ought to be agile and scalable instead.

(I.e. Golan, i.e. Principle of Lattice, Ph.D. yet multidisciplinary research).

- Every sector is still deeply divided in India. The lack in interdisciplinary mathematics is
- Modern business books by writers only feature in the textbooks. (Algebra, Logic, OR, Probability). The contents of these are also copied. Also disinformation is transmitted.
- Many students are mark-oriented and job-orientated (e.g., Indempotency in place of Idempotency, or sometimes instructors failing to fix the mistakes). There is not a great deal of expertise.
- Lack of illustrative hypothesis instances. Theorems are quite badly understood and balanced by studying everything with core, hence no growth.
- A project program has been developed and offers a broad range of original and creative research skills. It was sadly turned into a flop.
- A major drawback is that research methodology is not being included in the curriculum. Students, even. Ph.D. scholars are incapable of writing research papers.
- 'Rat race' and 'Herd mentality'

3.1 Reasons for Hindrance

- Reasons for this sad state of integration of knowledge towards enriched society
- We lack mathematicians who study Mathematical history. (American Mathematical Review: AMR) e.g Srinvasan Ramanujan, Late Dr. Vashishtha Narayan Singh, etc.
- Work is disoriented in India-we don't realize what we do, what we do and what we should do. Current patterns dismissed.
- The area of mathematical education is granted little priority at all stages.
- No other subject has such an up-to-date description.Do not use avenues.(American Statistical Reviews).
- They have so many ancient traditions that fail to leave.But for the new to take its place, the old must die, it must give way.

3.1.2 Drawbacks also include:

- Absence of analytical research.
- Any trend or topic is discussed only in one – day symposium/ seminars
- Marked difference in the Indian attitude as compared to developed nations
- Absence of statistical study.
- Absence of professional society or collective body to work on.
- Absence of a manpower department to estimate and predict the future course of research/ vacancies / job opportunities.

4. RECENT TRENDS IN MATHEMATICAL RESEARCH

1. Environmental Analysis
2. Mathematical methods involving Material Design
3. Safety and Precaution areas
4. Sensor Analysis in Espionage
5. Fuzzy Mathematics
6. Actuary Work - Finance, Pension & Insurance
7. Image Compression
8. Mathematics for storage of Finger Prints
9. Smarandache Notions
10. Biomathematics
11. Further Research into Geometry
12. Prediction Analysis
13. Cryptography/Coding Theory/ Steganography
14. Mathematics of the DNA
15. Application of Mathematics in Voting
16. Security and related features in Networks

17. Financial decision making

18. Neutrosophy

4.1 Trends in Mathematics Today

Trends in mathematics today would mean the focus on applications to study a 'real world' problem without the loss of generality of pure mathematics. Without the loss of generality of pure mathematics would mean, not to make much distinction between the pure and the applied mathematics.

4.2 Distinction between Pure and Applied Mathematics

It is now evident that the difference between pure and used mathematics is not focused on material, but rather on the mathematicians ' attitude and encouragement. The argument here is that the techniques of pure and functional mathematics cannot be distinctly distinct. Probably, for requires mathematicians to be able to grasp quite well the field of legitimacy of the strategies employed and evaluate how robust the results and to how extent the methods can be adjusted according to new circumstances, one distinction between the two does not consist of greater commitment to rigidity in the pure group

Studying a question in real world may include constructing a science question model and creating a mathematical model to describe the theoretical or logical model. For starters, the definition of applicable mathematics should first be sufficiently large to include mathematical components which correspond to some already implemented field of mathematics. Secondly, pure and practical mathematics have far more in common than anyone who listens to any of the outspoken proponents would anticipate. For the control theory and the analysis of large-scale structures, methods of mathematics known so far as algebraic geometry are added. Economics is implemented by the combinatory and graph theory. The fibre bundles principle is applicable to mechanics. In the analysis of error correction codes algebraic invariant principle is applicable. There is absolutely little distinction between mathematics pure and implemented. Therefore, developments in mathematics today are twofold: Firstly, it is important to emphasize the difference between pure and applied mathematics in the field of mathematics teaching and secondary incentives for current applications in the mathematics curriculum where appropriate. The developments in mathematics thus offer the affluent community an ability to reassemble by the cementation in pure and applied mathematics. There are no longer exclusive interests in mathematics in narrow spaces (single algebraic, geometrical, algebraic, homological, ring theory, real analysis, complex analysis, philosophy, etc.) There are no more exclusive interests.

4.3 Application to Computer Sciences

While discussing the trend of math, presence of computers need not to be overlooked. The role of computer is actually changing the face of mathematics. Computer plays a constructive role in our lives and in the evaluation of our mathematics. By taking certain subjects to greater notice, machines are transforming mathematics. Mathematicians also also developed new mathematics areas. For machine complexity theory, automaton theory, mathematical cryptology and so on, it simultaneously alleviates any boring dimension of conventional mathematical practice, which is more swift and precise than it would enable one to carry out computational research easily and painlessly. To complement our study of a specific question in real empirical examples calculations. All and all, the machine made certain mathematical technology popular before today in the curricula.

5. INTER- DISCIPLINE MATHEMATICS AND ITS CONTRIBUTIONS TO OTHER FIELDS

Through providing the latest forum for the teaching and assistance of a new wave of interdisciplinary mathematicians and scholars, Mathematics of the 20th century establishes a global standard. Disciplines which rarely use mathematics in their curricula now need a lot of mathematical knowledge. For example, curricula for the social sciences programmers now include sophisticated mathematics over and above the traditional descriptive statistics. Curriculums of some universities have interdisciplinary programmers where mathematics students and students from other disciplines or science work together on projects. The objective of such approach is to prepare graduates for the new approaches and practices in their fields and careers.

Medical science, medicine and biomedical science and engineering fields also deal with mathematics as per the demand of the discipline. Mathematics also play a greater role to speed up internet to sharpen the transmission of digitized images. Marketing fields, Banking arena, technology, use maths to predict pattern in the stock market. Maths is also used to enrich the entertainment world through contribution to digital technology. Thus, mathematics will make immense contributions in other fields by mathematical modelling, computational research, empirical studies and other mathematical technologies.

Mathematics refers to human biology, financial systems and abstract movements. For

Examples sciences now have a huge body of genetic information, and researchers need mathematical methods and algorithms to search

the data as well as clustering methods and computer models to interpret the data. Finance today is very mathematical; it has to do with derivatives, risk management, portfolio management and stock optimization or minimization. Both of these are mathematically designed and thus mathematians have an influence on the growth of innovative companies. Hence, the convergence of mathematics and the life science in society which was not foreseen a generation ago, is now a remarkable opportunity for application.

6. FUZZY MATHEMATICS: THE RECENT TRENDS IN MATHEMATICS

Fuzzy Mathematics and fuzzy set theory is the most vital emerging field for the inter-disciplinary trend of 21st century. Today, it is a vast growing body of knowledge based on physical sciences, social sciences, medical sciences, computer science, science and technology, economics, engineering etc. and mathematics.

Fuzzy mathematics has emerged as one of the best tools for Decision making theory. Fuzzy Decision model is a branch of mathematics that allows the scholars or researchers to model real world problem the way people do. Fuzzy sets of fuzzy judgment feedback or information, which enables a unclear, undefined and unpredictable situation to be explained easily. This offers extra versatility in participation that allows part participation feasible in a package. Exact reasoning is viewed as a limiting case of approximate reasoning. Fuzzy maths helps human society to involve in decision making incorporating human subjectivity rather than employing exact or precise measure of scientific method. This makes fuzzy decision making necessary tool to model any real life world problems.

6.1 Examples of Fields where Fuzzy Mathematics is emerging as trend for Research Arias

1. Demand in software reliability where mathematics is needed for computer language, architecture etc.

2. Security issues (mathematics for information and Communication, Mathematics for sensors, mobile communication as well as network security and protection.

3. Automated decision-making criteria including principle of possibilities, stochastic analysis, sensing mathematics, pattern analysis, and spectral analysis.

4. Future systems transportation problems, secured wireless communication system, super – efficient energy/ power sources, modelling and simulation, robotics and automation.

Therefore, advances in computing sciences and networking technology have rendered findings in fundamental sciences feasible for much of the breath over the last 50 years, for the remarkable innovations and inventions for enriching society. Certainly, the above mentioned field and mathematics have led to the emergence of many new areas of mathematics and enabled areas that were inactive to explore.

CONCLUSION

All these above mentioned trends have posed big challenges on the mathematics curricula at all levels of human society, education systems, research areas, teacher preparation and pedagogy. So the philosophy of the mathematics of the 21st century is to further reinforce efforts to reconnect the interdisciplinary divisions and make them more accessible to others and to foster the line of inter-discipline research to establish Integrated Knowledge Towards Enriched Society the theme of the conference and to maintain and sustain the nitty- gritty of motto of LIMCOS: “Integrated Knowledge for the Empowerment of the Needy,” Suggesting Fuzzy Mathematics as new area of application to integrate knowledge toward enriched society.

REFERENCES

1. Raj Kumar, and Pathinathan T., (May 2014), “Sieving out the Poor Using Fuzzy Tools”, International Journal of computing Algorithm (IJCOA), Vol. 03, pp. 972-985.

2. Raj Kumar and T. Pathinathan, (2014), Assessment of Poverty with Reference to Education-Employment-Income-Status of Children, Using Fuzzy Membership Ranking Model (FmRM), Published in Annals of Pure and Applied Mathematics, Vol. 8, No.2, pp. 99-113.

3. Raj Kumar, and Pathinathan T., (2014), Multidimensional Analysis of Poverty Using Fuzzy Set Theory in Rahui Block of Nalanda District, Bihar, Vol. 03, International Journal of Computing Algorithm, pp. 704-714.

4. International Journal of Innovation and Research in Educational Sciences Vol.1, Issue 2, ISSN (Online): 2349-5219.

5. Begle, Edward [1969]. "The role of research in the improvement of mathematics education". Educational Studies in Mathematics 3, pp. 232-244.

6. Begle, Edward [1972]. "Teacher Knowledge and Student Achievement in Algebra". SMSG Reports, No. 9.

7. D'Ambrosio, Ubiratan [1979]. "Overall goals and objectives for mathematical education". UNESCO: New trends in mathematics teaching, Volume IV, pp. 180-198.

8. Dubinsky, Edward [1991]. "Reflective abstraction in advanced mathematical thinking". Advanced Mathematical Thinking. Kluwer Academic Publishers, pp. 95-123.

9. Grouws, Douglas A. [1992]. Handbook of Research on Mathematics Teaching and Learning. New York. Macmillan.

10. Howson, A. Geoffrey [1973]. Developments in Mathematical Education - Proceedings of the Second International Congress on Mathematical Education. Cambridge University Press.

11. Howson, A. Geoffrey [1979]. "A critical analysis of curriculum development in mathematics education". UNESCO: New trends in mathematics teaching, Volume IV, pp. 134-161.

12. Kilpatrick, Jeremy [1992]. "A History of Research in Mathematics Education". Handbook of Research on Mathematics Teaching and Learning. Macmillan, pp. 3-38.

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