REACHING TO THE UNREACHED: POPULARIZING MATHEMATICS THROUGH COMMUNITY RADIO SERIES

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Abstract— Mathematics education is an area of concern in India as many students do not find mathematics interesting whereas many develop a psychological phobia towards the subject. Many students drop mathematics after grade X as mathematics is optional after grade X. Adults who had left mathematics after grade X continue to live with the same phobia for mathematics. The paper presents the highlights of a unique efforts introduced by students of Master of Mathematics Education program at Cluster Innovation Centre, University of Delhi. Students of semester I. They introduced an on-line community radio series, titled, “Popularizing mathematics among masses” through the most humble medium of communication, namely, community radio. It was an outreach program to make mathematics more eloquent and interesting for common people through the Community Radio Station. The paper also reflects on the need of more such programs in a diverse and developing country like India where multiple uses of resources through multi-media technology is the need of the hour.

Keywords— Community radio, Masses, Meta University

I. INTRODUCTION

Mathematics education is an area of concern in India as many students do not find mathematics interesting whereas many develop a psychological phobia for the subject. Many students drop mathematics after grade X as mathematics is optional after grade X. Adults who had left mathematics after grade X continue to live with the same phobia for mathematics. Mathematics is still considered to be a subject of prestige rather than a subject of necessity. Only few enjoy the status of being “good” in mathematics, other just struggle to pass the subject for the mandatory years. All major educational policies, position papers and reform documents (NCF, 2005; NKC, 2009) have again and again recommended considering mathematics a subject of national interest and a vehicle of national development (NPE, 1986). There are considerable concerns at the highest level in the educational setup to raise the standards of mathematics education and education in general. There are strong recommendations to change the way mathematics is being taught in the schools. (NCF, 2005; NKC, 2009; NCFTE,2010). Mathematics is essentially a subject of everyday needs. It is amongst the best tools to develop skills of logic, problem solving and analysis. It is therefore emphasized to teach mathematics to all students at least till grade X (NPE, 1986; NCF, 2000; NCF, 2005). It placed a great responsibility on mathematics teachers to present and teach the subject in such a way that students start connecting their everyday experiences mathematically. It requires a paradigm shift in the way mathematics is being taught in school. School mathematics as envisioned by NCF (2005) demands meaningful mathematics for all students with a scope of challenging mathematics for those who have a higher appetite for the subject.

II. CHANGING PARADIGMS

Reacting to the concerns in mathematics education and exploring the possibilities in higher education, two premium Indian universities came together to conceptualize the idea of a Meta-University and brought it to reality. In the year 2012, University of Delhi and Jamila Millia Islamia joined hands to merge institutional boundaries to expand the scope of higher education in the country. Though the concept of Meta University is not new to the world, in India it is the first of its kind. Within the scope of the Meta University, India introduced the founder course in mathematics education. It is a new beginning in the area of higher education and in the field of mathematics education in India. The Master of Mathematics Education Course (MME) is a unique course of its kind under the concept of Meta University, the idea propagated by National Knowledge Commission to expand the conceptual framework of universities beyond institutional boundaries. The MME course received its’ vision from the academic reforms seeded by National Knowledge Commission and also proposed by the University Grant Commission’s guidelines on Choice Based Credit System (CBCS), and flexibility in Curriculum Development. Raising the voice on strengthening the quality of education to transform India as a knowledge society, the National Knowledge Commission stressed investing in school education by preparing teachers who can meet this challenge.

The present course, Master of Mathematics Education has tried to embrace possible suggestions given by
various policy documents and reports on school education, teacher education and higher education. The immediate aim of the course is to prepare professionally inclined mathematics teachers who have sound knowledge of subject matter, who are specialized in constructive and alternate mathematics pedagogy and comfortable in the use of technology in mathematics teaching. The larger aim of the course is to develop mathematics education as an academic discipline to foster research and innovation in multiple aspects of mathematics teaching and mathematics as a subject.

- Need to connect theory and practice at all points of teachers’ preparedness
- Need to reform strategies in mathematics teaching
- Need to make mathematics teacher education curriculum more ‘hand-on’ and field based
- Need to enhance opportunities for competence and professional growth for mathematics teachers
- Need to prepare teachers to teach mathematics to all students with diverse abilities and background
- Need to make mathematics teaching more technology friendly enabling teachers and students use technology enabled resources in mathematical investigations.
- Need to link teaching with flexible assessment strategies to map the potentials of all students
- Need to include current research in mathematics education to the main curriculum of math teachers education

III. GUIDING PRINCIPLES OF THE COURSE

The main principles underlying in the framework of the course are:

- Mathematics should be presented to students as an interactive- experiential activity which affects all aspects of human lives.
- Human minds are inherently designed to conceptualize simple mathematical concepts and therefore all children can think mathematically, work mathematically and grow in mathematics.
- Mathematics learning can become meaningful when students are given opportunities to explore, investigate, analysis and rationalize mathematical arguments.
- Mathematics can make sense to students only when it is presented to them as a coherent and unified discipline of interrelated concepts.

- Mathematics ideas can grow more effectively in real-life contexts using the power of discovery and intuition.
- Teachers of mathematics should take the role of mentors and guides to facilitate classroom discourses by encouraging group learning.
- Mathematics teachers’ attitudes and personal beliefs significantly affect students’ disposition for the subject and therefore, it is important to push teachers to remove personal biases.
- In a class, students’ diverse experiences from their everyday environment can be the best resource for teacher.
- The culture of questioning, as questions asked by the students or responses given by students can give teachers valuable clues about students’ level of understanding.
- The art of effective communication is essential to engage children in mathematical discourses.
- Multimedia technology can act as an effective tool to transform mathematics learning a joyful experience for students.

IV. CONCEPTUAL FRAMEWORK OF THE COURSE

With above mentioned principles in mind, MME course features interdisciplinary, hands-on pedagogy and strong component of research practice. The course emphasis on conceptual understanding, advanced skills in teaching and learning of mathematics, art of communication to spread mathematical awareness among masses and effective use of technology to enhance teaching and learning of mathematics. The course balances advanced math content, theory of learning, direct teaching experience and research experiences to prepare students for exemplary careers in mathematics education. The course strongly emphasized the need of research and innovation in mathematics pedagogy. Students in its first semester took up a project to spread mathematics literacy among people/ adult community who have disconnected themselves from mathematics. It stated with an online radio series on community radio station to popularize mathematics among masses. It was a live show where listeners were encouraged to ask questions/share their opinion or to talk about their experience about mathematics. The topics were chosen which could generate interest among common people who were not pursuing mathematics related careers and found themselves totally disoriented for the subject. Some of the topics taken up in the series were: mathematics in everyday life; mathematics and nature; how to overcome math phobia, Indian women mathematicians; mathematics and hands on activities;
mathematics and civilizations with special focus on Indian mathematicians; mathematics made easy; careers in mathematics and how to identify and nurture potentials in mathematics. Each topic was well researched by the students of MME under the guidance of teaching faculty. Students worked in a group of two-three to prepare content after elaborated research on the chosen topics and it was well rehearsed by the group. The attempt was highly appreciated by the academia, teachers, students and community group who otherwise find themselves alienated from the system of education. The radio series was an attempt to present mathematics as a social construct and to highlight the humanistic side of the subject. It was a successful trial to connect to the larger population through a medium which is most popular, most humble and least expensive. The radio as a medium to connect to with masses is among the most powerful source. The radio series on popularizing mathematics was a unique attempt which was successfully tried out. The pilot experience has boosted the confidence of the students to soon launch a mathematics help line for school students, teachers, parents and adult learners. Hence, Master of mathematics education is a unique venture to experiment with ideas and to search for innovation to bring complete paradigm shift in the way mathematics is experienced. It is a small hopeful attempt to transform the future of mathematics education in India.

CONCLUSION

This initiative by the students of MME was started in March 2013. Almost at the same time a similar initiative was taken up by the Mumbai University with support from Department of Science and Technology, Government of India to promote mathematics teaching and learning using radio. The target group of the programme were students from class I to XII. All India Radio has also launched a new series – ‘Ankon ke khilari’ or ‘Magic of Numbers’ – as part of its program aimed at inculcating a scientific temper among the young. The 26 episode programme commenced from 6th October 2013. The programme has been produced in collaboration with Vigyan Prasar and the National Council For Science and Technology Communication (NCSTC) of the Department of Science and Technology. One can therefore safely conclude that radio can prove out to be a good media to popularize mathematics among the masses.

REFERENCES


Integrated School Experience

Figure 1 MME Conceptual Framework

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