

Practices and Possibilities in Nepalese Mathematics Education

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Abstract. Nepal is a developing country and it has innumerable challenges to accomplish. As a mathematics educationist, we are facing huge amount of challenges. In this paper, I am trying to fill the gap between international context of mathematics education and our way of practices. We are in a postmodern era, according to time and development, yet we are still practicing our conventional way of teaching and learning in mathematics. From the view of critical mathematics pedagogy, we have many ways to transform our traditional practices into the modern mechanism. We (Nepalese) are always oppressed by our culture, socio-political condition, our beliefs and foundation, civilization, religious practices, information and technology, economic status and educational practices. Despite of having such tribulations we are trying to change our society through our educational practices. Mathematics is considered as a key to triumph and it is essential in our daily life routine. For that, this small research can work as a bridge between our recent context and emergent issues in Mathematics Education.

Key words. Critical Math Pedagogy, Contextual Mathematics, Cultural Mathematics and Mathematics Education

Sommario. In un Paese in via di sviluppo come il Nepal, gli insegnanti di matematica sono chiamati a fronteggiare numerose sfide. In questo articolo cercherò di colmare la distanza tra il contesto internazionale in cui vive l'insegnamento della Matematica e le pratiche in uso nel nostro Paese. Viviamo in un'era postmoderna rispetto ai tempi e agli sviluppi, tuttavia ci si serve ancora di pratiche convenzionali nell'insegnamento e nell'apprendimento della Matematica. Secondo un approccio pedagogico critico, si dispongono di molti modi per trasformare le pratiche esistenti relative alla Matematica in meccanismi moderni. I Nepalesi risultano oppressi dalla loro cultura, condizioni sociali e politiche, le credenze, la civilizzazione, le pratiche religiose, l'informazione e la tecnologia, stato economico e pratiche educative. Si cerca attraverso pratiche educative di liberarsi da tali oppressioni e in questo senso la Matematica viene vista come un modo per trionfare nella routine della vita quotidiana.

Parole chiave. Critical Math Pedagogy, Contextual Mathematics, Cultural Mathematics and Mathematics Education.

Introduction

Our country is in the political reformed stage and it still needs a great amount of effort to face

the challenges for the sole transformation. To heal this burning situation “*Mathematics is ... a purposeful activity to deal with social, political and economic goals and constraints. It is not value-free or culturally-neutral*” (Almeida, 2010). Therefore, it can be a source for alteration. Transformation is a continuous process, it means, the way is long for our educational reform. This reformation program insists on the essentiality of two ladder steps and they are: (i) our belief system and (ii) physical structure and facilities. We have a traditional way of mathematics teaching-learning process and modern expansionary education is daily challenging us. On the one hand, Mathematics education could mean empowerment, but on the other hand it denotes suppression as well. It could mean inclusion but at the same time it means exclusion and discrimination: “Mathematics is not only an impenetrable mystery to many, but more than any other subject, has been cast in the role of an ‘objective’ judge, in order to decide who in the society ‘can’ and who ‘cannot’”. Therefore It serves as the gatekeeper to participation in the decision making processes of society. To deny some access to participation in mathematics is then also to determine, a priori, who will move ahead and who will stay behind.” (Volmink, 1994). Our mathematics curriculum is somehow good to this society but our instructional activities may not. We still are following conventional “chalk and talk” method in mathematics classroom.

Most of Nepalese teachers are unable to address our students’ voice. Vast majority of mathematics teachers are still teaching skill and drill in ways that serve only a select set of students (Confrey & Kazak, 2006). There are bags of things to execute. Our physical structure as well needs to modify. International students are already befriended with internet since decades but our students still do not know about computer; they are hanging on white papers messed up with black paint. Large numbers of students, especially from rural areas, are blind and blank even about TV. Information technology is beyond our access. Few city students are receiving those kind of facilities but rest of the students is living in the light of lamp. Critical mathematics education can be a route for the renovation of our society and structure. Critical mathematics talks about mathematics associating with power relations. knowledge and understanding of mathematics from the perspective of critical pedagogy is understood as a means for student (and teacher) self-empowerment to organize and reorganize interpretations of social institutions and traditions, and to develop proposals for more just and equitable social and political reform (Skovsmose, 1994).

Critical Mathematics Education in Nepal

Our society is a complex one. We are living in the 21st century; it has many merits and challenges too. Survival with dignity is the universal problem, to be faced by humankind. In these days mathematicians are severely involved to search out all the issues that are affecting the society. But we learn, through History, that the technological, industrial, military, economic and political complexes have developed thanks to mathematical instruments (Ernest, 2012). Critical mathematics education refers to a set of concerns or principles that work as catalysts for re-conceiving and redesigning the lived experience of school mathematics. These concerns or principles are meant to target issues of political agency in society through an examination of mathematics education. (Freitas, 2008). Further, Freire (1970/1998) advocated for a critical pedagogy that was grounded in the “present, existential, concrete situation” (76) whereby teaching might begin with the lived experiences of students, accessing their emotional and ethical ties to the situations in which they struggled for voice and equity (as cited in Freitas, 2008). In a Nepalese context, we are teaching textbook or content which is deploring the expansion of

knowledge is increasing repeatedly. So, Nepalese mathematics teacher need to be critical, they need to reflect their classroom practices.

Self-questioning and self-actualization is necessary requirement for modern mathematics teachers. Mathematics textbooks are written only for the sole purpose of the business. They care less about child psychology. Textbooks too often specify the appropriate tool to be used for the given problem, and leave out the crucial ethical moment of reflecting on whether the means suit the ends (Freitas, 2008). Therefore, as a critical tutor researcher, I would like to draw the attention of policy makers and mathematics teachers on some relevant questions: *Are you teaching students? Or text book? Are you passionate about teaching? Why do they teach for money or profession? Do they love mathematics? Do they love children? Do they concern about our future? Are they developing child friendly environment in their classroom? How can we make our classroom effective by using our own available resources?* I think these questions are valuable. Skovsmose and Borba (2004) are careful to suggest that the critical approach must always tend to the “what if not” of school mathematics, that it must investigate the possible - think the otherwise - and explore “what could be.” (p. 211). Moreover, they argue that researchers and educators must imagine alternatives about the mathematics education, which would be more inclusive, more playful and more relevant which finally assist to heal the current obstacles and problems by generating visions or descriptions with high activation and creation. The approach is profoundly hopeful and imaginative and offers educators a positive (and critical) mean for professional development. “*It confronts what is the case with what is not the case but what could become the case.*” (Skovsmose & Borba, 2004, p. 214). At least, we can give our own effort to initiate a new journey from our base. We are also educating our children with the attempt to make them more familiar about mathematical knowledge and its significance in their future life. Therefore, mathematics teachers play vital task to extend mathematical attitudes of children.

Developing teacher's attitude towards Mathematics Education

Before starting a career as a mathematics educator, a teacher needs to know about the importance and impact of mathematics on our society. What is more important: quantity of information or quality of knowledge? (Almeida, 2010). Mathematics education can support the development of an ideology of certainty (Borba and Skovsmose, 1997). Whenever we use absolute language, it becomes a little bit difficult to get its real life applications. Mathematics educators need to develop positive attitude towards mathematics so that the Student can think alternatively.

They will teach students to contextualize their solutions in terms of their own authority and social position presenting applications of problems in terms of hesitation, hedging, and ambiguity, and ask students to model their responses on the same language. Reflecting on the language of uncertainty allows us to reflect on the ethical dimension of our problem solving, to reflect on the implication of our proposed solutions (Freitas, 2008). Nepalese Mathematics educators should concern about the teaching methods that we are promoting; attitudes that we are developing; resources that we are using; beliefs that we are having and future that we are designing. Therefore, mathematics pedagogy can be an appropriate pedagogy for us to solve all these critical issues. Critical mathematics pedagogy is a tool to teach mathematics for social justice. Teaching mathematics for social justice has two dialectically related sets of pedagogical goals: one set

focuses on social justice and the other set focuses on mathematics (Gutstein, 2006). Mathematics education is a weapon to give voice to oppressed people into the mainstream development. I mean critical mathematics pedagogy can be an influential tool for modern society. To achieve this goal we must make of our teacher a critical teacher/ researcher or reflective practitioner.

Situating Nepalese Mathematics Education in a Global Context

The World Civilization is anchored in Mathematics. No one disagrees that Mathematics is the dorsal spine of the modern world. But this leads to focus the concerns about the future on Mathematics (D'Ambrosio, 2010). Real world is a small global society being attached with each human conscience and everything is interrelated, so mathematics and our societies are also interconnected. Mathematics always helps society for problem solving (Keitel, 2009). Mathematics education is rarely referred to as a “weapon in the struggle” for social justice and equity, but nothing in principle prevents us from enacting such a vision. And, there are increasing numbers of teachers and mathematics educators engaged in such practices (see, for example, Gutstein & Peterson, 2005). Mathematics Education is a wealthy research area. Its importance for Education in general is unquestionable. Mathematics Education is remarkably interdisciplinary as an area for research. It relies on research in various disciplines, particularly in cultural studies and cognitive sciences (D'Ambrosio, 2010). We understand the nature of lived experience as a mix of chaos and order, thereby giving rise to a multi-epistemic space in which to account for the artful world of experience (Mahony, 1998).

The position that academic mathematicians (are forced to) adopt now for their discipline is that it involves *mathematization*: to *mathematise* is to search for and describe patterns, to generalize, to make predictions, to revise conjectures and to prove. That is, “mathematics is what mathematicians do” (Grunetti and Rogers, 2000). To promote creativity, helping people to fulfill their potentials and raise to the highest their capability, but being careful not to promote docile citizens. We do not want our students to become citizens who obey and accept rules and codes, which violate human dignity (D'Ambrosio, 2010). Further, he added that education should promote citizenship teaching values and the importance of rights and responsibilities in the society, but it is important to be careful to avoid any form of irresponsible creativity. We do not desire our student to become brilliant scientists discovering the weapons and instruments of suppression and inequity. As a mathematics teacher, I am trying to incorporate the global views of mathematics education in classroom practice. When I was a traditional mathematics teacher, I was teaching textbook, which was not proficient to enhance the creativity and globalize the brain of the students. However, the pathetic thing is that, at the same time, I was not expecting my student to be a traditional learner. Is it possible? I started raising finger towards myself with lots of queries that were teasing my brain. I have a dream to contribute in the activity-based mathematics teaching, so that students can have easy access to its concept without any anxious feeling. The dream is a way of knowing, and it stimulates responses and attempts to understand it that collaborates with other modes of cognition (McNiff, 2008, as cited in Sharma 2012). As a critical teacher researcher, I will try to develop conceptual mathematics teaching process in my class. From now on, I will try to articulate my experience as a part of my reflecting journey of mathematics teacher, student and a novice researcher (Sharma, 2012). Our school mathematics needs a vision concerning with mathematical literary genre which would be supportive to supply

the skills and talent that is crucial for local and global citizenship. That is why; we need to develop skills and abilities to perform a two-way border crossing.

Conclusion

Mathematics educators of Nepal do have scores of problems teaching learning process. Still, we do not have any epitomic or marvellous results of educational deeds. Our educational structure is still not supporting us, according to the global context, but it is our worst plight that we have to struggle with modern society. Even now, we are not thinking about any foreseeable event. Critical self-reflection is the most powerful instrument for mathematics educators. We can initiate with the available resources and our current practices. We must think positive towards our profession and should change our attitude towards mathematics education. There is a saying that ‘Charity begins at home’. Therefore, every mathematics educator needs to give his/her effort to change within him/herself. Our knowledge, anyhow, is more or less similar to global practice but our practices are different, so attitude is the key to change our society through mathematics education. As the mathematics is everywhere, there are the golden chances for mathematics educators to be the leaders of the modern society.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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