Original Research Article

Telling an Untold Story of Pedagogical Practices in Mathematics Education in Nepal: Envisioning an Empowering Pedagogy

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Abstract

Conventional mathematics education practice glorifies the hypothetico-deductive reasoning and accompanying reductionist and piecemeal pedagogy and pushes us into the grips of pouring and 'one-size-fits-all' approach (Freire, 1993; Luitel, 2009; Lamichhane, 2021). It is still being practiced and occupies the dominant role in our schools and universities. In this background, the objectives of this research were to explore the roles of existing pedagogy behind a formation of a transmissionist image of pedagogy, thereby envisioning empowering/humanizing pedagogical practices. In so doing, I deployed an autoethnography research design (Bochner & Ellis, 2016) under interpretive, critical, and postmodern paradigms (Taylor, Taylor, & Luitel, 2012). Writing as a method of inquiry (Richardson & St. Pierre, 2017) has been used to generate field texts. To interpret and make meaning from the textual information, I have used Habermas's Knowledge Constitutive Interests (Habermas, 1972) and Jack Mezirow's Transformative Learning Theory (Mezirow, 1991) as theoretical referents. I have captured the pedagogical practices under three themes: -practice makes a man perfect! I am a successful teacher; he is our supporter! Please protect him! and I do not know anything! Prepare them for the exam. Likewise, a metaphor of empowering/humanizing pedagogy has been proposed as an inclusive pedagogy. Finally, I revealed that empowering/humanizing pedagogy supports connecting mathematical activities to the lifeworld of the learners. It promotes agentic aspects of the learners and helps them to become informed and conscious citizens so that they can contribute to creating an inclusive and socially just society.

Keywords: *Empowering/humanizing pedagogy; Pouring pedagogy; Socio-cultural and historical perspectives; Transformative mathematics education*

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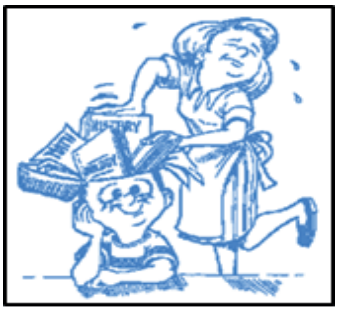
Emergence of Research Issue



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This research is based on the first authors' Master of Philosophy (MPhil) dissertation. It explored the first author's lived experiences of pedagogical practices. The second author is a supervisor and mentor who has played a significant role in bringing this research into this form. As we witnessed, the pedagogical practices of our schools are dominated by transmissionism and supported by a behaviourist school of thought. The behaviourist school described teaching-learning activity as a stimulus-response process (Bower & Hilgard, 1986). It ignores humans' potential for learning and their cognitive capability. Highlighting the characteristics of modern formal mathematics classes, Taylor et al. (2007) argue that school becomes a place where teachers tell many lies to students in which there is no opportunity for students to share their true feelings and experiences.

I (the first author) rarely got an opportunity to share my true feeling, emotion, and experience during my school and university years. Students' voices were silently ignored and compelled to accept *'taken-for-granted assumptions'* as legitimate and authentic knowledge. Teaching-learning activities seem to pour information into the empty minds of the learners. It is akin to Freire's (1993) banking concept.

Banking pedagogy overlooks students' cognitive, lingual, ethnic and socio-cultural diversity and adopts the *'one-size-fits-all'* approach. This disempowering pedagogical culture impacts our beliefs, thoughts, and practices and seems responsible for germinating negative beliefs, attitudes and perceptions towards mathematics. It is a great challenge to change our meaning perspective or deep-seated mindsets of conventional pouring pedagogy because practitioner actions explicitly/implicitly rest on their worldviews (Lerman, 1990). Without changing the deep-seated meaning scheme, it is challenging to transform pouring pedagogy into more authentic and empowering ones (Mezirow, 1991). It creates confusion and discomfort and compels me to engage in critical reflective practices to envision empowering pedagogy. In this regard, I have formulated the following research question to navigate my research journey.

Research Question

How do existing pedagogical practices help me to form a transmissionist image of pedagogy, and how do I conceive empowering pedagogy?

Research Methodology

Research methodology is an overall reflection of how the researchers see the realities, which approaches are used to unearth these realities, and whose values are recognized. (Willis, 2007). I believe that mathematical reality and its accompanying pedagogy are emerging and constructing entities and highly remain fluid and flexible according to times, places, immediate contexts, and environment (Taylor, Taylor & Luitel, 2012). Likewise, I acknowledge multiple ways of exploring mathematics knowledge. Mathematical knowledge is not value-free and neutral because of its nature of genesis and evolution which entangle within socio-cultural, historical and political settings (Hersh, 1987). This worldview leads me to incorporate a multiparadigmatic design space. I incorporate the paradigms of interpretivism, criticalism and postmodernism (Taylor & Medina, 2011).

The paradigm of interpretivism focuses on exploring the context-based subjective meaning and helps uncover the personal beliefs, values, perspectives and actions associated with his/her socio-cultural milieu (Bryman, 2012). It guides me to construct the intersubjective meanings that reflect my feelings, pleasure, beliefs, and values (Taylor, Taylor, & Luitel, 2012). Likewise, the paradigm of criticalism enables me to critically reflect on self-experiences and question the power dynamic of society and the dominant ideology of the ruling class (Gutstein, 2006; Gutiérrez, 2012; Kazima & Mussa, 2011). It energizes me to envision alternative mathematics education by creating a rational balance between local and global cosmological knowledge systems. Finally, the paradigm of postmodernism supports capturing the essence of pluralism through the multiple ways of exploration via; personal narratives, letter writing, metaphorical logic and dialogue (Wall, 2006; Taylor, Taylor & Luitel, 2012). These three paradigms support me in bringing the thick descriptions of the context, critiquing the tacit beliefs, powers and ideologies and celebrating pluralism. In so doing, I have employed autoethnography as a research method.

Autoethnography as a Research Method

From the above discussion, I understand that pedagogical practice in mathematics is a complex phenomenon. It is difficult to capture its true essence numerically because of its embeddedness in the social, cultural, historical and political milieu. People's behaviours, emotions, beliefs, attitudes and experiences are shaped according to the immediate environment in which they are grown up. In this context,

I used autoethnography as a research method to explore the existing pedagogical practices and envision an empowering/humanizing pedagogy in mathematics.

Autoethnography is a research method in which researchers can explore their experiences through critical reflection on personal experiences and social, cultural, historical, ethnic, lingual and economic influence on their practices. It is an approach to portray (graphy), the personal (auto) and ethno (other) experiences through multiple logics and genres (Ellis, 2004; Bochner & Ellis, 2016). It allows researchers to ventilate their true feeling, emotions, belongingness, and experiences and tell untold stories through; narratives, dialogues, letter writing and metaphorical representation without any fear and constraints that help uncover the hidden values, dominant power structure and hegemonic ideology that severely affect mathematics pedagogy. In this vein, Allen (2011, as cited in Qutoshi, 2015) argues that autoethnography is a research methodology that works as an 'un-locker' of exploring hidden values and perspectives, discloses socio-cultural and political roles, unfolds the forces behind the marginalization and victimization, 'energizer' that empowers the voiceless and powerless, a 'challenger' enables the researcher to disrupt canonical ways of knowing, being and doing things as taken for granted; an 'enabler' that develops capacities in self/others so that they can become change agents and contribute to creating inclusive and socially just society. Realizing these views, I have decided to use an autoethnography research to explore my earlier transmissionist pedagogy and envision a humanizing pedagogy.

I employed writing as a method of inquiry (Richardson, 2003) and critical reflectivity to uncover my values, convictions, and practices through the lens of larger socio-cultural, historical, and political settings. In my inquiry, it plays a significant role because it extends my field texts to alternative interpretations and meanings that widen intersubjective epistemological stance keeping me aside from being hooked on a particular privileged reality, ideology, and value (Richardson & St. Pierre, 2017). It is a process of layer writing which helps in the process of meaning-making (Konblauch & Baranon, 1984, as cited in Elbaz-Luwish, 2002) and makes writing more viable and livelier.

Theoretical Referents

To make meaning from my narratives, stories, dialogue, and metaphorical logics, I used Habermas Knowledge Constitutive Interests (Habermas, 1972) and Transformative Learning Theory (Mezirow, 1991) as theoretical referents.

Knowledge Constitutive Interests

Habermas (1972) described the process of knowledge construction in the history of humankind. He described technical, practical and emancipatory interests as three fundamental interests. Technical and practical interests focus on controlling and understanding, whereas emancipatory interest concerns emancipation and freedom.

The technical interest helps understand how educational institution validates and represents the interests of the ruling class to control and manage the social and institutional settings for their benefit (Habermas, 1972). It supports me in unearthing the power dynamics, disempowering forces, and hegemonic ideology which underpin transmissionist pedagogical practices and enrich the neutral views of mathematics as asocial, acultural, ahistorical, and apolitical. Likewise, practical interest focuses on consensual meaning-making and understanding processes that somehow ensures the involvement of higher-and middle-class groups of society who have access to the decision-making process (Habermas, 1972). Finally, emancipatory interest focuses on the empowerment and emancipation of practitioners irrespective of their social, cultural, economic, lingual and ethnic backgrounds. It recognizes the potentiality of learners to shape their lives and argues for providing autonomy and responsibility to the learners so that they can feel empowered and take ownership of their actions (Habermas, 1972). Emancipatory interest enables and energizes me to work as an autonomous researcher having social and institutional responsibility so that I can envisage humanizing pedagogy that supports fostering the culture of mutual respect and empathetic relation which contribute to heal the wounded humanity.

Transformative Learning Theory

I used transformative learning theory as another referent. It is a lens to see how individual learners and researchers can come across the perspectival changes in their belief system, ways of knowing, being and doing. The transformative learning theory suggests me using critical reflective practice as a powerful tool that helps not only explore deep-seated mindsets of the self and others and taken for granted assumption as a form of knowledge but also teaches me how I can make meaning from individual and collective experiences to shift preoccupied meaning schemes toward new meaning perspectives (Mezirow, 1997). I realized that transformative learning is a process of meaning-making of our lifeworld through critical reflection on action, in action and for action (Schön (2017). This critical reflection cycle helps dismantle the problematics

frame of references and thus opens new discourses of inclusiveness, empowerment, liberation, emphatical relation and transformation (Mezirow, 2003; Lamichhane, 2021). In this research, transformative learning theory enables me to engage in critical self-reflective practices of my experiences and enrich my understanding of the embedded forces behind a pedagogical practice which leads me to shift my values, beliefs, thinking, and actions further support to prepare the ground for envisioning the alternative humanizing pedagogy in place of transmissionist ones.

Results and Discussion

As an autoethnographer, I have explored my pedagogical values, beliefs and experiences through narratives, story-telling, conversations, letter writing, metaphorical logic and critical self-reflection. Now, I turn my attention to make meaning from this rich information through the help of the theoretical lenses mentioned above in the following subsections.

Practice Makes a Man Perfect! I am a Successful Teacher!

It was a day in July 1992; people were gathering in my neighbouring house for helping to construct a muddy flat. I joined the campaign to assist them. It was seven o'clock; Radio Nepal was broadcasting the news. I carefully listened to news because it was time to publish the SLC (School Leaving Certificate) result. The SLC result was published which was held in January 1992. Only 24% of students were declared to have passed the exams. Out of them, approximately four thousand students secured first-division marks (60% or above). Hurry up! Our SLC result had just been published. I informed to all of my dearest friends that our result had been published. We went to the district headquarters to search *Gorkhapatra* (the official newspaper of the Government of Nepal), the only source in which the SLC result was published. We hardly purchased a copy of *Gorkahpatra*, paying approximately five times more than the usual price. It was my pleasure to obtain the first division. Another two friends secured the second division, and none of the others were able to succeed. I returned to my house. I shared my pleasure with my parents. Hurry up! Hurry up! I stood in the first division. My parents offered me *Tika* and blessed me for a bright future.

> *Two days later, three of my villagers came to my house and requested to take a tuition class for their children. I thought it was time for me to earn some pocket money. I agreed with them. Next day, they sent their children to my house. I asked them which*

of the topics they felt most difficult. They showed their interest in the unitary method.

Firstly, I described the step-by-step procedures for solving the problems related to the unitary method. They raised a question; how do we determine the condition of whether the right-hand member is divided or multiplied by the given number? Are there any best tricks for solving the problems? I explained the direct and indirect variations between variables. If the variables are related in such a way that a change in one variable might cause a change in another variable in the same direction, then you should change the number in the same manner. If the variables are so varied that a change in one variable might change other variables in the opposite direction, then you should change the number in the opposite manner.

Now, I asked them to solve all the problems given in the textbook. Do not hurry during your reading times. Firstly, revise all the examples solved in our textbook that help solve other problems. Being a student of mathematics, you should not be lazy. You must solve every problem as many times as possible before attending the final examination. Practice makes a man perfect! Please take it as a Guru Mantra (instruction of the teacher that needs to follow without question). It is one of the major strategies I have adopted for preparing for the SLC examination.

After a week, their parents came to my house. They seemed very happy. They said their children devoted more time to mathematics and other subjects than before. Their children told them I taught them fundamental concepts at first and then solved the problems by describing step-by-step procedures and making a connection with lifeworld situations.

The conventional approach of my teaching method is nothing but pouring information into the empty minds of learners and ways of power over the learners through abstract mathematics knowledge and tacit teaching procedures (Davison, 2008). Teachers and educational institutions un/knowingly act upon the learners from their perspectives. I realize that my teaching could not break the boundary of informing pedagogy in which students could hardly develop only a few lower-order cognitive skills that restrict the learners within the frame of reproducing the pre-existing knowledge (Alam, 2013). Similarly, another salient feature observed in my teaching is the adoption of reductionist pedagogy in which I break down the concept of mathematics into small managerial components that provides the compartmental knowledge and skills to the learners (Ahmed, 2013). I have realized that such a

pedagogical approach is predominantly obstructive to the learners because it does not foster conceptual, relational and cultural understanding. Initially, I was captivated by conventional pedagogy. It celebrates the technical, mechanical, and instrumental (Habermas, 1972) aspects of mathematics education.

Only standardized technical approach to mathematics eccentrically emphasizes pure mathematical knowledge that helps erode the cooperative attitude, collaborative work, and culture of respect, ultimately giving the birth of consumerist ethos in our society. In this connection, I understand that mathematics education is not an isolated entity. It has a pervasive effect on every sector of the world. Now, I focus on articulating my pedagogical experiences during my university years.

He is our Supporter! Please Protect him!

I was very enthusiastic about university education after completing SLC in the first division. I had no idea about university education. My parents and relatives had suggested studying a technical or vocational subject that could secure my future life. I heard that at the university level, all subjects are taught in English medium. Highly professional academicians are there in the teaching field. I worried about the language of teaching because I was poor in English than in other subjects. Because of my interest in mathematics, I decided to choose a mathematics education as my future career subject.

I was admitted to the Pinnacle Multiple Campus at the district headquarters, Bharatpur. I found that teaching methods were quite different from my previous assumptions. Most of the teachers came with their notebooks. They either wrote subject matters on the boards or read the notebook loudly to convey the information to the learners. Students were compelled to write a note. Teachers performed as orators, and we were obedient listeners. If we find the previous notebook of the respective teachers from our seniors, it is not necessary to take their classes. Rather than attending a class regularly, it is far better to prepare for the final examination by self-study. I felt ashamed to recall our mathematics classes herein again. It was the most painful event in my academic journey. To solve the problem correctly without looking at their notebook was very difficult for some of our teachers. I was confused about whether the educational institutions opened only for employment for someone else. Why was an educational institution established without having trained and qualified human resources in higher education? Who was responsible? Who do hear our voices?

It could be any day in November 1994. Our mathematics teacher came to our class to teach set theory. It was a new term for us. He opened his notebook and wrote a definition of the set on a chalkboard. He tried to describe the meaning of a set. Set is set….., set….. is set, set is….. set,… Set is ….set. He did not complete his sentence even though he repeated it many times. He again looked at his notebook, but he could not describe the meaning of the set spontaneously. Similarly, he defined the different types of sets and operations on sets with the help of his notebook. We were all busy copying the definitions and theorems to prepare precise notes. The bell rang, and the class was over.

We shared our feeling. It was found that no one can make meaning from this class. Meanwhile, one of my talkative friends, Palpali, shared his experiences. He found that the teacher pronounced the word set 157 times during the class. We were planning to complain to the campus administration. Meanwhile, Sital advised us to wait for some days. We waited for a week; we did not find any significant improvement in his class.

One week later, we wrote a complaint letter to the campus chief.

To
The Campus Chief
Pinnacle Multiple Campus
Bharatpur, Chitwan

Subject: Regarding the Mathematics Class.

Dear sir,

We apologize to inform you that our mathematics class has not been conducted well since last week. Firstly, we diplomatically requested our teacher to improve. We waited for a week, hoping to improve the teaching style. We could not find any changes in his teaching strategies. So, we heartily request you to replacement of our math teacher. We need a mathematics teacher with sound content and pedagogical knowledge, and experience in teaching. If our demand is not addressed within a week, we will be compelled to take any action that will be aggressive and obstructive. The campus administration will be responsible for all the consequences that the movement will create.

Yours Sincerely
All the students of I. Ed, Second year
Mathematics Group.

After three/four days, the campus chief invited only two students representing the class. Our class gave authority to *Gorkhali* and me to dialogue with the campus administration. We had already collected some information regarding the academic and professional expertise of *Dr. Set.* We entered the Campus chief's room, where the campus chief, *Mr. Authority* and *Dr. Set* were there. We did not agree to start a discussion with the campus administration in *Dr. Set's* presence.

> *The campus chief briefly describes the present condition of teaching/learning activities at the campus. It has been very difficult to find another teacher recently. I am annoyed by his arguments. Sir, why do you offer a mathematics program without well planning of human resources? Is it a business house? Gorkhali overtakes me. Sir, he has not passed his master's degree until now. He has just secured only second-division marks in those subjects declared to be passed. How can he handle our class? Gorkhali further argues that to be a good teacher, he should have sound content and pedagogical knowledge. He is not able to define simple mathematics concepts and cannot give contextual examples. We have observed for more than a week. We cannot find any improvement in his teaching strategies. We do not know anything; we need another teacher.*
>
> *Mr. Authority makes notes of our complaints. He showed me a short message in which he wrote that he (Dr. Set) was our party member and you needed to help him. I do not care about his notification. Mr. Authority said finding an experienced and qualified mathematics teacher is very difficult. I have just advised him to improve his teaching strategies. He also agrees to take extra (tuition) classes if necessary. Similarly, the campus chief argues that if you confront your teacher, it would negatively affect your marks in teaching practice. I will help you in teaching practice to secure good marks that will support you in increasing your overall percentage in the final examination. Gorkhali stops him and replies. Sir, you want to bargain with us. We do not come here to beg marks in teaching practice. We quit the dialogue and immediately left the room. Mr. Authority pulls my hand and secretly says it is our own college, and our opponents want to interrupt it. You should be aware of this matter. Please handle the case wisely. I will help you in every step of your future.*

The above narrative reflects ground realities of mathematics teaching-learning activities at the university level, teachers' mathematical contents and pedagogical knowledge, teachers' beliefs about pedagogical practices, and institutional positions/

roles. I am not so astonished by the pedagogical choices and implementation because teachers are not alien; they are the product of our educational practices and socio-cultural milieu. Profound mathematical content knowledge and specialized mathematical content knowledge are the very foundations of a teacher's competency. Ball, Thames, and Phelps (2008) mentioned that teachers who do not know the subject matters very well are less likely to know how to help students learn these contents more appropriately and fruitfully. They convey only the information they learned. It signifies that the teacher is the most significant influencing factor for developing positive/negative images of mathematics (Lane, Stynes & O'Donghue, 2014). Teachers' lacking good content and pedagogical knowledge, self-confidence, and low achievement help create a vicious circle of negative attitudes, beliefs, images and avoidance, and anxiety toward mathematics and teachers transmit the negativity to future generations (Jackson, 2008). Teachers' beliefs, knowledge, cognition, and worldviews influence what happens in the classroom, what teachers communicate with their students and what students learn (Wilson & Cooney, 2002). Teachers should be independent thinkers, problem solvers, artisans, and orchestras so that they can uniquely demonstrate mathematical concepts, skills and knowledge.

Moreover, schools and universities in Nepal have not been institutionalized yet. These institutions become the replica of mainstream political parties. Political parties send their sister organizations to these universities and schools to control and manage these institutions according to their political ideologies. Students' unions and professional organizations of teachers and employees disturb academic and other professional activities (Panthi & Belbase, 2017). They generally raise the issues of appointments, promotions, and other politically oriented affairs rather than the academic betterment of the institutions. As a student, teacher and practitioner-researcher, I witnessed that they (teachers and students affiliated with their different sister organizations of mainstream political parties) rarely debate the present academic and research trends of their respective subjects. Without having sound knowledge and skills and engagement in contemporary discourse in respective subjects, teachers simply perform the file duties in which students' aspirations, emotions, feeling, and voices cannot be addressed. It indicates that conventional/dehumanizing teaching-learning activities are one of the most significant influencing forces for generating negative images of mathematics among practitioners.

I do not Know Anything! Prepare them for the Exam

It could be any day in July 2018; I was sitting on my chair in a faculty room after finishing my duty. Prof. Entrepreneur invited me. I went to his room, and Prof. Entrepreneur was busy with his laptop. We exchanged greeting. Prof. Entrepreneur said that the university has just published the result of the fall semester. Parents were not satisfied with the results. The overall results of our college are excellent, but the result of one of the technical subjects of the first semester was nil.

Similarly, the result of mathematics in the first semester is not excellent. Only sixty-one per cent of the students have passed mathematics in which no one could secure the highest grade (Grade A). He asked, sir, why is the result of mathematics poor? He further added that, according to the parents, our teaching/learning activities could not orient to prepare our students for the final examination. Nobody cares about other skills, knowledge, and concepts without getting good test marks. For the sustainability of our institution, we need to maintain the first position in the district. Whatever the teaching methodology or procedures, all of us need to converge our attention to secure the first position; otherwise, our source of income gradually diminishes. In this respect, teaching in a private institution is tricky compared to other institutions. How to improve our results in these subjects?

After listening to his arguments, I gently replied. In my opinion, results do not entirely depend upon classroom teaching alone. So many interrelated factors implicitly or explicitly affect the results. Firstly, we need to consider our intake of technical subjects. Most of the students fail in technical subjects which require profound mathematical knowledge, indicating that our students are very poor in mathematics. I have not expected sixty-one per cent results in mathematics. It isn't easy to complete the course on time. I have taken approximately 20 extra classes to complete the course. I have used technological devices to teach mathematics this semester. I have demonstrated complex mathematics problems by using mathematical software. Another salient feature of my mathematics class is that I try to create a learning environment in which students can engage deeply in the learning process. Rather than rote learning and memorizing certain formulae and algorithms, I offer them to solve mathematics problems at their own paces and ways and encourage them to ask questions and participate in learning discourse. I do my best to boost their confidence by contextualizing mathematical problems in their lifeworld. I realize that the constructivist approach to teaching/

learning activities helps them secure higher positions. I hope they will improve their achievement in the coming days.

Prof. Entrepreneur argues that his intention is not to blame his faculties. However, some of the parents claimed that teachers could not make students fully concentrate on the upcoming examination. Our faculties did not solve all of the issues given in the textbook and could not provide helpful tricks and techniques for securing maximum marks in the final examination. Finally, I like to say that it is our private organization. At any cost, we need to satisfy our stakeholders. Students gradually conceptualize the subject matter and its relations to other subjects and real-life situations in their future lives. So, we need not care about other things, but our results must be excellent. Theoretically, your opinion (indicating me) is highly appreciative; however, our educational culture focuses on quantity rather than quality. I hope that our teaching/ learning activities focus on better achievement. Thank you for your valuable time and suggestion.

From this discourse, I have realized that the mathematics education practices of Nepal have been dominated by utilitarian views of mathematics. This view of mathematics and its embodied transmissionist pedagogy prepares the learners for particular life choices that the experts and elites projected rather than rational life choices (Cotton, 2001). It has also been legitimized by a conventional assessment system in which students are urged to reproduce intended mathematical facts and concepts. In this regard, Ernest (1991) has argued that there are five ideological groups in mathematics education, out of which industrial trainers, technological pragmatics, and old humanist are likely to hold the utilitarian and Platonic view of mathematics. It ignores the individual learners as having the cognitive ability to choose or determine their life choices. It aims to impose decontextualized and objectified mathematical knowledge for commercial use which is controlled by business houses rather than focusing on liberation and enlightenment (Keitel & Vithal, 2008). Teachers are not autonomous in teaching-learning activities according to their rational choices. They are enslaved by commercial textbooks and cooperate business houses. Teachers are always circumscribed by the conventional assessment system that only searches mechanically mathematical elites (Keitel & Vithal, 2008). The conventional assessment system creates a hierarchy in schools and turns into a culture of discrimination in society. It largely ignores the cooperative and collaborative learning approaches that lead to the exploitation and domination of one group over another in the classroom and society

(Cotton, 2001).

Mathematics learning is a social process in which students and teachers simultaneously engage in mathematical discourse. Teachers must create an environment in mathematics classrooms where students can express their thoughts and true feelings and participate freely in mathematical activities. It helps internalize themselves as the agents of social transformation (Marshman & Grootenboer, 2012). To make our mathematics education more inclusive and authentic, we need to explore the hindering forces that entrench our society within the grips of socially unjust practices. In doing so, mathematics teaching needs to flourish the alternative views of mathematics as value-laden and social (Ernest, 1998) and imperfect subjects (Maheux, 2016) so that learners can read and write the world through mathematics (Gutstein, 2006). Its principal objective is to foster the critical consciousness of the learners so that they feel empowered and become critical citizens who can contribute to a deep-democratic and socially just society.

Envisioning Possibly Humanizing/Empowering Pedagogy

> *It could be any day in December 2015; we were discussing a critical pedagogical approach. Prof. Facilitator argued that mathematics teaching-learning activities did not need to be limited to solving bookish questions but could explore the connection of mathematics with real-world practices that helped understand the contemporary socio-cultural, political and economic landscapes of the society and nation. It led to develop critical and emancipatory thinking so that practitioners became conscious and supported to enhance social justice and deep-democratic practice.*
>
> *Immediately, I expressed my opinion. Sir, it looks like the schooling of a political party in which they devote most of the time to discussing the agenda of social inclusion, social justice, empowerment, and democracy. Is it our business?*
>
> *Prof. Facilitator gently replied it is indeed the work of a mathematics educator. Mathematics teaching should not restrict informing the student about the mathematical facts, rules and algorithms to solve routine problems. It needs to explore the interconnection of mathematics and socio-cultural, political, linguistic, and economic issues in which students are grown up. It supports learners in understanding contemporary power relations and their implicit and explicit impacts on mathematics education. An opportunity of engaging in social, cultural, political, historical, and educational issues, students can internalize existing social inequality, exclusion,*

economic disparities, access to educational opportunities and impact of political power in different sectors of the society and nation so that learners become conscious citizens.

Initially, it takes some time to convince me because I have long practices of mathematics teaching as a form of the symbolic game played with paper and pencil for re/justifying, re/proving and reproducing mathematical knowledge, facts and concepts. Gradually, when I read the seminal works of Ernest (1991, 1998), Lerman (1990), and Gutstein (2006), I realize that mathematics is such a historical subject that helps learners to participate in current social, political, economical, technological, and ecological discourses. The next day is my turn to make a presentation regarding my experiences throughout the journey of the course. I am worried about how to make a presentation. What should be the appropriate pedagogy that can address the shortcoming of the conventional pedagogical practices of mathematics education in Nepal?

Now, I am ready for the presentation. Prof. Facilitator briefly revises our journey throughout the course and the status of the journal submission and allows me to present my views on mathematics teaching.

Dear Prof. Facilitator and Friends,

I present my views about mathematics pedagogy based on our course and my experiences. Most of us agree that conventional teaching cannot produce the desired results in mathematics, so we need alternative pedagogical approaches which are more empowering and humanistic and can bridge classroom mathematics to the broader lifeworld of the practitioners. Now I describe how to make mathematics teaching more empowering and humanizing.

First, we must create a classroom environment where students can share their experiences. Teachers continually make a conscious attempt to understand children's actions because they have their socio-cultural practices and prior experiences so that both make sense of each other. If students cannot crack the code of mathematical symbols and language, they won't make meaning of mathematics teaching. Limiting students in solving undue bookish questions prevent creative, imaginative, critical thinking and problem-solving skills. To foster these skills, problem-posing strategies should be one of the best alternatives.

Problem-posing strategy is not a panacea; however, it is the most humanizing and empowering pedagogical approach. Teachers and students simultaneously engage in mathematical discourse to make meaning from multiple perspectives. They become

healthily skeptical of the 'taken-for-granted assumption' and disturb the 'status quo' in the mathematics classroom and society (Stinson, Bidwell & Powell, 2012). Likewise, teachers need to create an environment in which students are free from constraints and impaired self-representation so that students from different cultural groups, gender, economic and lingual backgrounds feel empowered and autonomous in their learning and take control of their own learning and lives (Taylor & Williams, 1992). The classroom becomes a learning culture in which all voices are equally recognized and valued. Students are willing to take ownership and authorship of their learning (Burton, 1999), which makes mathematics teaching-learning activities more humanizing and democratic.

Dear Professor and Friends,

Let me present my visions on humanizing pedagogical approach. In my opinion, conventional mathematics teaching in schools and universities cannot address the humanitarian aspects of learning. Many scholarly articles and research reports indicate that mathematics teaching-learning activities are unable to use humanistic approaches (Burton, 1999, Lerman, 1999; Cobb, 2006) because teachers always hurry to accomplish the pre-assigned course contents within a given time framework (Wang, Koyama, & Lee, 2014). Restricting mathematics teaching-learning activities in reproducing a body of knowledge makes teachers and students more instrumentalist, thereby ignoring the humanitarian aspects of mathematics. Humanizing pedagogy recognizes the learners as cognizing beings, and teaching aims to foster higher-order thinking rather than relying on lower-order thinking. It advocates for embracing socio-cultural, historical, and political aspects of learning and intends to explore the attributes of cooperation, collaboration, consensual meaning-making, understanding, empathetic relation and probing (Habermas, 1972) so that it can address the contemporary crisis in society.

Conventional pedagogy is unable to explore socio-cultural, historical, and political dimensions embedded in mathematics education and thus become unaware of the interdependence and interconnectedness of mathematics with other natural and human disciplines (Pinar, 2004). In this connection, I want to suggest adopting the humanizing pedagogy in a mathematics classroom in such a way that helps to promote students' spiritual, moral, social and cultural development (Winter, 2001).

Humanizing pedagogy supports to develop the ecological consciousness among practitioners that enhances the interdependence of human beings to the environment.

In this context, teaching-learning activities should devote to engaging in exploring the meaning of mathematical knowledge from their immediate contexts and environments. Such a perspective of teaching-learning incorporates the view that human cognition is not only bounded within individual heads, it is also distributed throughout the body and immediate environment (Lerman, 1999). It signifies that humanistically oriented teachers, curriculum designers, and practitioners need to change their worldviews about mathematics and its teaching-learning activities so that they can contribute to developing new meaning perspectives (Mezirow, 2003) to help transform the world into a better place for all creatures.

Transformative learning insists on dialectical and dialogical approaches and aims to raise student consciousness. In this regard, Cranton (2010) mentions three fundamental stages of teaching for transformation: empowerment, critical reflection, and self-actualization. Teachers need to consider how learners feel empowered. In doing so, teachers should create an environment in which students can exercise power, take responsibility for their learning, engage in mathematical discourse, critically reflect on their experiences, and develop metacognitive thinking skills that liberate learners from all sorts of false consciousness (Cranton, 2010). Arriving at this point of inquiry, I conclude that humanizing pedagogical practices also helps flourish the transformative views of mathematics and possibly can be an alternative pedagogical practice in the context of Nepal.

Conclusion and Implication

I articulate my pedagogical experiences of becoming a tricky and reductionist teacher during my early years of teaching. At that period, I thought teaching-learning mathematics means to solve bookish questions using specific procedures and urging students to follow the same step-by-step procedures. The conventional teacher education programs of universities prepare prospective teachers who can only do file duties (Grundy, 1987). Likewise, teacher recruitment procedures are not transparent and are highly influenced and distorted by political parties' ideologies, preventing transformative mathematics education practices. Moreover, profit-oriented private educational institutions support the development of consumerist ethos at the expense of social, cultural, and historical realities and their knowledge cosmologies. Privately managed educational institutions have become the central place of exploitation (Kirylo, 2013) because these institutions have spread the misconception of learning

as obtaining the so-called highest marks in the final examination. This discourse signifies that university teacher education programs, research culture and pedagogical approaches are highly responsible for conventional mathematics practices. In this regard, to transform the existing pedagogical practices towards more inclusive ones, I have envisioned an empowering/humanizing pedagogy. In this pedagogical approach, teachers and students have to get an opportunity to engage deeply in teaching-learning activities in which both groups are skeptical of the 'taken-for-granted assumptions' as tacit knowledge. Teaching-learning environment is highly democratic so that teachers and students can involve in free and pure discourses (Taylor & Williams, 1992) in which they can express their arguments for and against particular perspectives and knowledge. It supports exploring the dominant power structure and the hegemonic ideology of the ruling class or owners of educational-corporate houses, and learners can take an informed decision. Moreover, humanizing pedagogy recognizes the learner as a cognitive, affective, spiritual, social and historical being and orients to foster creative, critical and imaginative thinking so that learners become conscious citizens and take informed decisions.

Finally, the research implies that our pedagogical practices in mathematics classrooms seem to be dominated by the pouring approach in which learners are treated as non-cognitive, ahistorical, asocial, non-affective and non-spiritual beings. To liberate mathematics education from these narrowly conceived and non-humanizing practices, we first need to envisage and implement more empowering/humanizing pedagogy that energies learners to become change agents. In these perspectives, I have explored the existing pedagogical practices through my autoethnographic vignettes, which reflect the true essence of mathematics teaching-learning activities and uncover the forces behind these practices that restrain mathematics education within four walls of classrooms. The thick description of the contexts and teaching-learning scenarios, influences of ruling parties' ideologies, privatization and commercialization of educational institutions, and finally, envisioning alternative empowering/humanizing pedagogy offer the practitioners to reflect critically on their experiences and encourage them to engage in such discourses that certainly yield the positive vibes in mathematics education and contribute to open a path of transformative mathematics education.

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