AUTOETHNOGRAPHY: A METHOD OF RESEARCH AND TEACHING FOR TRANSFORMATIVE EDUCATION

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Abstract

This paper discuses the thesis that autoethnography as tool in research provides the researcher to examine his or her pedagogical and research practices from his or lived evocative experiences. The essence of this paper is to seek the possibilities of linking autoethnography as a method of inquiry that catalyses the transformative pedagogy positively in mathematics education. It is an outcome of my dissertation of Masters of Philosophy (M.Phil.) in Education. I highlights the importance of autoethnography in research in a way that permits researchers to apply flexible modes of inquiry from their life experiences with motives of change to take place in educational institutions and classroom practices.

Introduction

I was in a journey of research but I was not able to shape a topic in the researchable form. I was not consistent in the selection of a research area and then the topic of research. Really, I feel that it is a difficult process for a novice researcher like me to develop an idea of research at a time.

For me, to find a research topic was to find a pearl on the infinite beach. Metaphorically, it was like thousands of shells are found on the beach but rarely does one of them give us pearl. Thousands of research areas were there but it was difficult for me to shape one into a researchable form. I faced the problem since the very beginning of this study. In my usual class on research methods, I first tried to go with "Effectiveness of a Collaborative Classroom on Learning Mathematics". That was a kind of experimental research and I found some difficulty in the formation of the experimental group and control group. Also it was necessary to design the teaching content and program for a collaborative class. I found the project a little too vast for me due to time constraints and other resources.

Then I shifted to "A Study on the Viability of the Mode of Distance Education in a Nepalese Context". One of my professors advised me not to select the area as there are no literatures or research studies in the area in a Nepalese context. I would have to design different modes of distance education and test their effectiveness in a Nepalese context. It could be a very ambitious research project. It was beyond the scope of my capacity in terms of ability, resources and time.

I had a strong impression of quantitative research as the exact way of doing research for construction of new knowledge. In

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my understanding every research should have scientific methods and procedures to conduct study and reach to the empirical conclusion. I think it was due to my positivist approach that involved a definite view of social scientists as analysts or interpreters of their subject matter (Cohen, Manion & Morrison, 2002). When I read the book "Research Methods in Education" by Cohen, Manion and Morrison (2002), I got ideas of scientific and positivist methodologies, naturalistic and interpretive methodologies, and methodologies from critical theory. The review of the book was a turning point in my understanding of research methods and procedures especially in social and educational research.

According to Hitchcock and Hughes (1995) as cited in Cohen, Manion and Morrison (2002), ontological assumptions (what I believe about the reality of the world) give rise to epistemological assumptions (how I perceive or reach to the realities of the world); these in turn give rise to methodological considerations (approaches to find out the relative realities); these in turn, give rise to issues of scientific or semi-scientific instrumentation and data collection. My interest in research deviated to some extent from quantitative to qualitative and from positivist (relatively higher absolutist) to constructivist (relatively higher relativist) and post modern politicized critical theory. This shift became solid when once in December, 2005, Assistant Professor Bal Chandra Luitel gave me his Master's thesis to read and reflect on. I read it thoroughly. I found it very interesting and full of rich mathematical philosophy, methodological flexibility and aroma of literature. It was like 'water for a frog after long drought'.

I thought to choose my research area in constructivism in mathematics education. I was easy to pick up a jargon "constructivism" but very challenging to cope with the essence of constructivism. How to start and how to shape it was still a dilemma. I read some literature on constructivism but still I was not sure about how to design my research. I thought to conduct interviews with Kathmandu University's graduate student-teachers about their perception of constructivism and then to observe their classes and to study their practice of constructivism in the classroom. But after reading Bal's master's thesis, I was impressed by his artistic/impressionistic writing in representing his lifeworld. A question came in my mind. What are the practices of teaching and learning of mathematics from a constructivist's lens in Nepalese High Schools and Colleges and how can the practice be helpful for transforming from traditional approaches of teaching and learning into a constructivist approach? I wanted to dig out from my own experience from early childhood until now and further possibilities as part of a new avenue of my professional journey.

Then I read a few chapters of the Handbook of Qualitative Research (third edition) edited by Denzin and Lincoln (2005). After reading a few chapters I again turned to the pages of Luitel (2003). *Narrative explorations of Nepali mathematics curriculum landscapes: An epic journey.* I could understand the praxis in the thesis more than before and I thought to write a thesis on the basis of my own experiences as a student, a mathematics teacher and an educator.

In this research I wanted to explore upon my experiences for data as they are the ultimate source of information for me to know the context of learning mathematics from early childhood until now and then teaching of mathematics. As an auto/ethnographer's point of view, I think I have been the closest observer of how I learnt mathematics from early childhood to the university and how I practiced teaching mathematics at different levels.

Autoethnography: My Method of Inquiry

I started writing poems, my stories of teaching and learning mathematics with failure and success, pain and relief, twists and turns in the life from a remote village of Piparkhutti of

Dang to a crowded capital city of Kathmandu. I wanted to portray my lived experiences so that others (readers) start reviewing their own stories and experiences, and start reflective practice in classroom teaching and research (but not necessary). It is always a choice of an individual about how to learn and teach (very individual). This study opened the door for me to enter into a new practice as an auto/ethnographer in educational research in Nepal.

I have followed an auto/ethnographic method of inquiry. In autoethnography, the author of an evocative narrative writes in the first person, making him or her the object of research and thus breaching the conventional separation of researcher and subject (researchee); the story often focuses on a single case and thus breaches the traditional concerns of research from generalization across cases to generalization within a case (Geertz, 1973, Ellis & Bochner, 2000, as cited in Newton, 2004).

Etymologically, the term autoethnography comprises three different words: auto, ethno and graphy, which signify the textual representation of one's own personal experiences in his/her social, political, economic and cultural context (Luitel, 2003).

Autoethnography is "…research, writing, and method that connect the autobiographical and personal to the cultural, political and social context. This form usually features concrete action, emotion, embodiment, self-consciousness, and introspection…and claims the conventions of literary writing" (Ellis, 2004, p. xix, as stated by Jones, 2005). The charm of the research lies on how you enjoy reading it as a literary epic journey and reflect back on your own practices and encourage you in envisioning of your future.

Further, Spry (2001) states that autoethnography is a self-narrative that critiques the situatedness of self with others in social, political, economic and cultural context (p.710). Jones (2005) states that autoethnography involves setting a scene, telling a story, weaving intricate connections among life and art, experience and theory, evocation and explanation … and then letting go, hoping for readers who will bring the same careful attention to our words in the context of their own lives (p.765).

Autoethnographic inquiry subscribes to the nomolithic worldview (Denzin & Lincoln, 2005) what reacts radically against the realist/absolutist agenda of non-auto-ethnography. Autoethnographic writing can be depicted as the metaphor of a camera (Ellis & Bochner, 2000 as cited in Luitel, 2003), which focuses on the rarely heard stories (Van Manen, 1988) but there is danger that your images might have been overshadowed or emphasized with excess colour in the photoshop of an autoethnographer.

I have tried to look me from own pedagogical, philosophical and axiological standpoint not from others' self because that makes me more aware of my pedagogical practices and research methodology from positivism to constructivism and postmodern perspectives. It also makes me more responsible in the process of narrating my experiences weaving intricate biography from the past to the present in order to interpret my own consciousness in the political, economic and socio-cultural contexts.

My Pedagogical Practices

I have experienced myself that my teaching and learning practices have changed a lot with the passage of time during the last two decades. I did not have knowledge of how children learn and how their learning can be enhanced. I was simply a transmitter of knowledge from me to students, by hook or by crook. Perhaps, rote learning of theories and formula and solve problems using them was my technique of teaching them mathematics.

When I finished my B. Ed. degree in mathematics education, I had some idea about methods of teaching mathematics. I had learnt about Bloom's

taxonomy of behavioral objectives during the learning process. I was guided by a behaviorist approach to the teaching and learning of mathematics. I tried to follow Bloom's taxonomy as the guideline to form classroom objectives of teaching and learning mathematics when I was a mathematics and science teacher in Bageswari High School at Baireni Dhading. My approach was more formal procedural and one line traffic in which students had rarely any chance to learn from themselves and interact with me in the classroom.

After my M.Ed. Degree in mathematics, I was impressed by Piaget's theory of learning. Developmental psychology became my guiding principle of teaching and learning of mathematics. Gagne, Ausubel, Bruner and Bandura's learning theories had been inscribed into my pedagogical practices. Piaget's theory was more dominant during my teaching at secondary and lower secondary levels.

Later on, during my course of teaching mathematics at Kathmandu University School of Education, more changes came in to my pedagogical perception and practices. My teaching of mathematics to undergraduate level at TU some years ago and now at KU has been characterized by a wide ranging paradigmatic shift, from a more traditionalist and behaviorist approach to a modern and constructivist approach in terms of conceptual understanding and practice too.

Episode of Teaching of Mathematics

I think it should be a winter's day in 1996. The chilly cold with a westerly breeze made me coil up in my bed till late morning. I had to reach my school by 9.30 a.m. I was a bit late that day, as I could not get tempo to reach the school on time. I was just five minutes late. My students were playing outside the classroom. I went in to the classroom without appearing in the office. I sent one of the students to get the attendance register from the office. After taking attendance, the ritual of teaching and learning maths started.

I asked Rupak about the day's lesson. He said that it was to start values of trigonometric ratios of standard angles. I made a chart on the board for the values of 0, 30, 45, 60 and 90 degrees of Sin, Cos, Tan, Cosec, Sec and Cot ratios in tabular form. All the students wrote these values in their copies. Udip stood up from his seat and asked me how these values were determined. I replied that these values could be found by geometrical methods. But he was not satisfied. I saw him in gloomy mood and he was looking at me with an unsatisfied look. I told him that at first they have to be rote learned and then we would start solving problem. I told them that geometrical proof of how to get Sin 30° = ½ was not necessary for them at the time.

When all the students finished their writing, I told them to read silently the values of Sin ratio for ten minutes. I moved front and back in the class while they were reading the values from the table. After ten minutes, I told them to stop reading and be ready to reproduce.

I pointed to Sanju and asked, "What is the value of Sin 60°?" She replied correctly with some confusion. Then I pointed to next one, Deepak, and asked, "What is the value of Sin 45°?" He said," ½". I gave him a gentle pat on his head and said, "No, it is one over root two." I asked the values of all, one by one in turn. Some could give the right answer and some were in confusion. I told them to read the same at home. The bell rang and my period in the class was over.

My routine of teaching mathematics continued with the methods and practices as is obvious from above. I did not let my students ask questions. I did not encourage them to do group work or cooperative learning. The class used to be in my full control and the students were passive listeners and copiers. I considered myself as the source of all mathematical knowledge to them. I was a transmitter of the knowledge to them and they were the receivers. Sometimes I used to give physical punishment to the students when I felt that they were not paying attention to my

lecturing. How much they received was tested in the terminal and final examination.

How cruel I was in the classroom and how merciless was my pedagogy at that time. I was still thinking myself as a good teacher in the school and I was proud of being mathematics and science teacher in the school among others. I taught algebra with symbols and relations but never tried to explain what those symbols meant and how the relations were established. Making students more confused with complex algorithm was a fun to me and I learnt it from my 'gurus' to make mathematics a complex world to the classroom.

After few years I started teaching mathematics in a high in Kathmandu. It was a private boarding school. I was a part-time teacher though I had to teach four periods a day. I remember a day in winter in 1998.

I entered into a class of grade ten. The students were practicing mathematics from a practice book. They were going to appear in grade ten send-up examinations. So, they were a bit more serious than other days. Query asked me a problem from geometry section. I wrote the problem on the board and told all the students to try it themselves at first. Nadeem tried it and showed me. He did a minor error and I advised him to correct it. Jeena and Pherina were trying their best. Query was grooming over the diagram to find the ways to solution. For fifteen minutes only Nadeem reached to the solution and others could not do it on time. I called Nadeem to the black board and told him to solve the problem for others.

Mijendra did not understand his figure and explanation. I helped Nadeem to explain his problem solving strategy. Mijendra nodded his head showing that he got the idea. Then I told all the students to open the practice book (the SLC practice book). I advised them to select two geometrical problems from the practice book which they felt difficult to understand. There were fourteen students in the class. So, there were more than twenty geometry questions that came from them. I gave them five problems to solve in the class.

There were three students in a set of bench and desk. I told them to work in group from each benchers. Nadeem helped Mijendra, Punam helped Nisha, Pherina-Query-Jeena formed a group and discussed the problems sharing among themselves. Similarly other students also tried their best in their group.

Finally Nadeem's group could solve seven questions, Query's group solved five questions and Punam's group solved four questions and rest two groups solved only two questions in that period.

I told them to practice the rest of the problems at home. The bell rang and my period of the day was over.

My experience of teaching mathematics taught me more about student centered teaching and I introduced new approach of group work and peer work in practice. Mount Glory Boarding High School opened a door of such initiative in my classroom practices as the school principal was flexible enough to bring and implement new practices. School environment and priorities of school administration and parents play significant role in the pedagogical choice of teachers in the classroom. I was fully supported by the school and parents to apply the way I feel better and my students learn better in the classroom.

My Pedagogy at Kathmandu University

One day in autumn 2005, I was grooming over the computer monitor to find some teaching materials in the internet. I opened the internet browser and typed www.google.com on its search area. Google search engine opened. I typed "Algebraic Thinking" on the search area. There were lots of websites listed. I opened some sites and tried to find some materials for the day's lesson. I found a reading material on the topic and saved it on the desktop. I got the material printed and then photocopied to distribute all the students.

Students came into the class at ten in the morning. I had already kept some cardboard boxes, some

pencils, markers, cardboard papers, print papers and masking tape on a table. I welcomed students in the class. I wrote the topic of the day "Algebraic thinking" on the white board. Then I distributed some blank sheets to each student and asked them to write what they knew or thought about algebraic thinking without reading any material. I let them twenty minutes to finish their writing. I facilitated them while they needed my help during the time they were writing.

Some finished within twenty minutes and some could not and I increased five minutes so that all would be able to finish their writing. All of them finished writing within twenty five minutes.

Then I provided them the reading material that I downloaded from the internet and let them fifteen minutes to read and ten minutes to write what they learnt after reading. They finished reading and writing on time. Then I divided them in four groups with three in each and asked them to discuss in group about what they had thought before reading and what they thought after reading. I let them discuss for fifteen minutes.

The discussion on the topic continued for fifteen minutes. The students shared their views before reading the paper and after reading it. Then they summarized their views in a print paper in three groups. Each group presented their views and opinions turn by turn by fixing the written print papers on the wall.

In the second session I showed three boxes with some pencils in one, and other and some cardboard papers in the third. Then I asked the students in three groups to generate an idea of algebra from each box.

A group wrote an equation to represent the relationship between numbers of pencils in two boxes, next group wrote the concept of index number from the box of cubic shape and another group wrote their concept of inequality from the three boxes. Then they discussed in the group about their concepts of algebra out of those materials. Lastly a member from each group summarized their algebraic thinking about the objects under discussion.

At the end of session each student reflected on what algebraic thinking is and how it is related to real life situation.

I think how to use technology to find teaching and learning materials has been a very important part in my educative process in KU. I was heavily depended on textbooks and some reference books for teaching and learning. But when I joined KU as a student at first and as a faculty member later, I learnt how to find reading and teaching materials in the websites and how to use them in classroom teaching and learning. Multimedia devices in the classroom teaching and learning of mathematics became usual to me. In my understanding the application of new technology has helped me a lot to enhance the teaching and learning of mathematics.

I was not much aware of the teaching materials and activity-based teaching. But when I participated in peer teaching with Bal Chandra, I got idea of activity based teaching and student centered teaching through various interactions and discussions. I think mathematical knowledge is constructed and acquired actively by the subject of recognition. It is not acquired by transmission or discovery. Enforcement by others becomes detrimental to constructive activity (Nakahara & Koyama, 1998). So, I tried my best to provide the situation to the students to learn by themselves through reflective practices in the classroom.

Nakahara and Koyama (1998) state that mathematical knowledge is constructed by thinking activities reflectively. It is then corrected and refined through social interaction. My students reflected on what they thought about "Algebraic Thinking". I think it was the most important part in constructive teaching and learning. It created a situation of learning, bridging and connecting.

I think, my pedagogic practices in the classroom became more student centered and self reflective. But the assessment part could not become as good as the discussion and reflection in the class.

I could not give the immediate feedbacks to the students.

Being Mathematics Educator

I fix a solar calendar on the board. I ask the students to choose four numbers (dates) from the calendar in 2x2 matrix form without leaving gap. Then I ask them the sum. One of the students on the first row says 36. Then I tell him that 5,6,12 and 13 are the dates he has selected.

There is a silence for a while and then a buzz. Another student says the sum to be 20. Then I thought for a minute and told him the numbers 1,2, 8 and 9. Some more students tell their sum and I tell them the numbers they chose from the calendar. I write a question on the board, "Determine the algebraic structure of the numbers in the game". Then they start buzzing in pair. After few minutes some of them say that they can write the structure. I invite one of them to come to the board and write the structure. He does it in no time and it was an excellent example.

I then put another question to them, "Form one more such game from the calendar". They work in-group. The class is busy in writing numbers in rows and columns in different pattern and form a game with an algebraic structure. After fifteen minutes they present five/six such games from the calendar. I write one more question on the board, "What is the significance of the game in teaching algebra?" They mention some very important points such as – the game links arithmetic with algebra, it helps to form patterns of numbers with algebraic relationship, it helps to be creative, it makes students thoughtful, it promotes learning algebra with fun, it is a way of learning by doing and learning by playing and so on.

What a nice consequence it is of linking the number concept with algebra and patterning to developing mathematical structures. I cheer the smiles in their face.

The session ends with students' reflection on "what did I learn from the activity?"

I think my start in the lesson seems fine. It is good to start a discussion or lesson from a game. The activities are engaging and creative but still there are lots of things to improve. When the class was over and I was on the way, I remembered that I forgot to summarize the algebraic expression. Teaching and learning is collaboration among students and teacher. At the higher level, the responsibility is shared among both the learners and teachers. The way the learners are motivated and they show enthusiasm towards learning, the instructors (now facilitators) make their vision and plan of classroom instruction and support. Students are mature enough to decide what way they learn better and what way they are sure that they have learned. Teachers are only the facilitator to them. I tried to play the role as facilitator. But to be a facilitator is far different from being an instructor. In a changed context, if students do not feel their responsibility of learning and they try to take chance from facilitation class, that turns into a disaster and a great disaster. So the way I tried to implement the facilitating class was leading towards the unseen disaster. I became very careful that my students would not take my class as a loose class and there is not strictness in the class. Constant guidance and interaction to the students in the class can lead the teaching and learning process towards success and my experience of being facilitating teacher at Kathmandu University has taught me a great lessons. I tried my best to be a transformative teacher rather than only a good teacher in the classroom.

Pedagogical Metamorphosis

The dictionary meaning of metamorphosis is a change of appearance; change from one form into another one. We can observe metamorphosis in geology and biology. It seems to me that metamorphosis in geology is a change of mineral composition, structure and texture inside rocks, due to higher pressure, temperature and chemical factors. Metamorphosis is creating new minerals or changing existing ones. I think

that zoological and biological metamorphosis is a passage from one evolutional step to another one with important changes in appearance (for example the transformation of a tadpole into a frog). To me, metamorphosis is a change of nothing into something, from something simple into something complicated, perhaps a fool into a sage (relatively).

It seems to me that beliefs and practices also change with experience, study and new knowledge. A child learns social behaviors and becomes a good citizen in later days. A student learns a lot from school level to university and becomes a good professional or good thinker. A teacher can change his/her pedagogical practices with time and context after long experience, study and training. I think that such changes in the practices of teaching and learning from behaviorist to constructivist or traditionalist to modernist and postmodernist constitute a pedagogical metamorphosis. Pedagogical metamorphosis is parallel to philosophical metamorphosis, but I have dealt both with the name "pedagogical metamorphosis".

I realize that my teaching mathematics at school level was more dominated by traditional approach and with experience and some training it was shifting towards a constructivist approach. When I started reflecting upon my own pedagogical practices, I realized the lacking in my practice. Autoethnography helped me feel that I was not doing as what I needed to do. The narratives of my past experiences helped me to understand what my grounded practice was and what it should be for better classroom practices in the future.

I also realized that there is no one correct method of doing things and making them work properly. In brief I would like to express my pedagogical transformation from past to present and draw a trend for future practices.

Teaching at high schools: I followed traditional methods of teaching mathematics in the classroom. Constructivism and sociocultural theory was far beyond my imagination. The classroom was in my full control and students did as I instructed. Textbooks and me were the sole source of mathematical knowledge in the classroom. I never paid much attention to students' ideas and creativity.

Teaching at Tribhuwan University: My sole method of teaching in Tribhuwan University was lecture method followed by problem solving by students. I taught the students theoretical proofs and derivations with few problems solving on the blackboard. Students practiced problem solving at home. Group discussion, peer learning and project work was almost null.

Teaching at Kathmandu University: I thought myself an experienced teacher when I entered Kathmandu University. I had more than three years of teaching experience at undergraduate level and ten years of teaching experience in school level. I was proud of my way of teaching by lecturing in loud voice and problem solving on the blackboard for the students. I sat in Bal 's class when he was teaching in PGDE. He was teaching the students with application of various approaches involving students in discussion and peer-work. Sometimes he took students out of the classroom for a game and asked them the essence of the game in teaching and learning mathematical concepts. Slowly I got acquainted with his new approaches of teaching mathematics. Until now I have been learning from him and his practices.

I have found four stages in the process of pedagogical metamorphosis while I am working at School of Education as a teacher educator.

Stage one starts when I enter in School of Education as a part-time teacher. I learnt more about student centered teaching and learning, application of games in teaching mathematics, and discourse in the classroom as a means of learning.

Stage two starts with my narrative exploration of my own teaching and learning practices. During

the course of my thesis writing, I come to know various theoretical backgrounds of mathematics education, philosophy and psychology. The review of various literatures available in the library and internet help me to understand my ground realities of perception and classroom practices together with research.

Stage three begins when I complete my thesis and get promotion to the position of lecturer in School of Education in August 2006. But this stage becomes more challenging to me as my senior 'Guru' Bal goes to Australia for his Ph.D. I am a new teacher educator in the School and also our Mathematics Education in M.Ed. program is also a new experience for us. There are lots of challenges to bear. These challenges help me to cope with difficult situation and be more proactive in managing the program. The M.Ed. and PGDE programs are helpful to me in developing my teaching philosophies in many ways. I am getting constant support from my seniors from within the school and abroad.

Stage four starts with new visions of mathematics education in Nepal. I have visualized a possibility of more student friendly mathematics classes in all Nepali schools. We have to develop our cultural values, norms and practices of mathematics education by critical leadership in mathematics education, new philosophical explorations and pedagogies.

Autoethnography opened my eyes to see who I am. Autoethnography opened my mind to realize who I am. Autoethnography opened my soul to understand what I am doing and what I need to do.

Closing the Discussion

I saw my past through a lens of my present perspectives and I realized what I could do and what I am doing. I reflected upon my practices and confessed on wrong practices that happened knowingly or unknowingly. I viewed my present and analyzed my position from philosophical stand point. Then I envisioned my future through the lens of present and determined to continue my pedagogical improvements. Thus my pedagogical metamorphosis is on the way to evolution with many ups and downs, turns and twists and further possibilities of changing colors and putting new wings.

In my understanding, reflective practices in the teacher education plays a significant role in the teacher development. Autoethnography as a genre of writing for research can bring a dramatic changes in the educational institutions if applied seriously and realized the past and present and envisioned the possibilities of future. Autoethnography has been a lens to view one's own practices and realizing the gap between what needed to do and what is going on. So, in my understanding, autoethnography is a catalyst in my pedagogical metamorphosis from a novice traditional teacher to a constructivist teacher from perception to practices. The only disadvantage of this approach of teaching and research is coloring the realities with attractive paints with expressionistic and impressionistic art of writing as research. The pedagogical thoughtfulness and wakefulness that this method creates among the readers can compensate this loss if it is taken positively and created a powerful message to the readers for change in classroom and their life world for betterment and success.

Autoethnography is a self-critical reflective form of writing where the author uses his or her life experiences in some topics of discussion and it should not be understood as a mere autobiographical narration but it is to describe significant points of life in definite political, social, economic and cultural context seeking changes and improvements.

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