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## Mathematics Teacher Educators' Journeys Towards Transforming Identity: Autoethnographic Reflections

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### Article Info

### Abstract

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*The central attention of this paper stems from my ongoing PhD journey, in which I am transitioning from being a submissive teacher to becoming a transformative mathematics teacher educator. Drawing on research studies and personal experiences, I have observed that many mathematics teachers face challenges in improving their pedagogical practices to make teaching and learning more meaningful and relevant in the Nepali context. In this scenario, the paper aims to explore how my identity is evolving from that of a submissive teacher to a transformative mathematics teacher educator. Autoethnography is employed as the research methodology to explore the researcher's journey. Illeris's transformative learning and identity theories serve as theoretical referents for my study, and I have shared my experiential learning in a sociocultural context. The key finding of this paper is that changes in thoughts, beliefs, and actions drive identity shifts of mathematics teachers in social contexts. Additionally, this study offers insights for mathematics teachers and educators who strive to transform their professional identities. In writing this paper, I have been mentored by my PhD supervisor, who acted as the critical reviewer of the ideas presented in the paper, thereby serving as the second author. Although the paper is collaboratively written, it uses first-person pronouns to focus on myself as the subject of the inquiry representation.*

**Keywords:** Traditional pedagogy, transformative learning, autoethnography, identity transformation

Within Nepal's evolving educational landscape, and particularly in mathematics education, the teacher's role is coming under critical scrutiny (Dhungana, 2023). No longer regarded as mere custodians of static knowledge, teachers are being increasingly called upon to act as reflective practitioners and agents of change. Such transformation is particularly urgent in contexts characterized by deeply entrenched cultural routines, deeply rooted traditional pedagogies, and systemic limitations that often hinder innovation and critical discussion in the classroom.

In the broader context, my ongoing PhD research examines the professional and personal growth, I have undergone, transitioning from a compliance-oriented mathematics teacher to a transformation-oriented, reflective mathematics teacher educator. I have examined my traditional teacher-centric pedagogical practices and explored transformative pedagogy, which is also known as student-centric pedagogy. This has involved critical exploration of my practice, identity, and beliefs in response to the sociocultural contexts of the Nepali education system. Employing autoethnography as my research method, I situate myself at the center of this inquiry, relying on my own lived experience to examine the broader pedagogical concerns that math teachers in Nepal encounter (Wall, 2006). By sharing this tale, I am not only to map the transformation of my own identity but also to provide a space for reflection for other educators to examine their own professional stories and consider what it means to teach

mathematics in culturally responsive and transformative ways through stories.

### Context Setting

*It was a sunny morning on October 15th. Like every day, that day also started with my journey to campus. On the way, I suddenly remembered that it was a special day, as one block had been added to my age today. Just then, my steps turned toward the temple. I went to the temple and prayed to God: Who was I yesterday, what am I today, and what will happen tomorrow? I am a university mathematics professional with many years of experience in teaching and learning culture, reflecting my age. I was highly guided by behaviorism, which is teacher-centered and has a one-size-fits-all nature to teaching pedagogy. At some point, I realized I needed to gain new insights into my teaching and learning. Is it easy to change one's conventional habits, beliefs, and attitudes into a new approach? Implementing effective pedagogical practices is not only possible at my level. All the educational institutions, curriculum designers, and other responsible persons can play a crucial role in this pedagogy reforming and transforming movement. However, my primary goal is to continually increase student engagement through participation, interaction, collaboration, and group work, utilizing project-based learning in my class. Additionally, mathematics can be made more engaging, attractive, and relevant by connecting it to the socio-cultural context. Therefore, for effective teaching and learning, not only the behaviorist approach is preferred, but also constructivist and transformative teaching approaches can be utilized. Thus, there is a need to improve teaching and learning activities, for which I can improve my pedagogy. From this, I can walk the path of changing contexts. I was occupied with all these thoughts, and I happened to stumble on a small rock. At once, I was impelled to the current reality informed by my thoughts. Thinking about all this, I reached my college.*

It appears from the narrative mentioned above that I was a part of an autocratic tradition and culture from the beginning of my teaching profession. In this context Uibu and Kikas (2014) argue that authoritarian teachers are dominant and restrict the behavioral and psychological autonomy of students. I pursued my education in a similar situation and followed a similar pattern after entering the teaching profession. Ahmed (2013) notes that teacher-centered pedagogy primarily relies on lectures as a means of communication in the classroom, resulting in students being mere recipients of teachers' knowledge. Traditional teacher-centered pedagogy is a style of teaching in which the teacher assumes primary responsibility for communicating knowledge to students from their point of view (Mascolo, 2009). Classroom-centered learning involves a rigid body of knowledge (Luitel, 2012) that the teacher determines to proceed with unilaterally. This learning style inspires rote memorization and encourages passive behavior (Li et al., 2014). It slowly erodes creative and critical thinking, reducing the questioning power of students and thereby diminishing their self-confidence, ultimately leading to intellectual dependence (Lamichhane, 2022). Students may learn that asking questions or offering alternative perspectives is undesirable or even punishable. Over time, this can lead to a significant reduction in their willingness and ability to engage in critical inquiry.

Observing the above situation, I gradually felt that efforts were needed to assist mathematics teachers in incorporating more pedagogical methods into their instruction. A major problem I encountered in the field of teacher education is the implementation of various approaches for improving mathematics classrooms (Pant, 2017). As a practitioner in the field of teacher education, I am concerned about my pedagogical change, as many of my colleagues are. Then, slowly, I began to guide myself toward overcoming this anxiety and embracing the path of critiquing. After that, I began challenging my values and beliefs as a teacher, teacher educator, and researcher. Can I ensure the best learning for students by spending most of the class time explaining mathematical concepts, rules, and procedures step-by-step to deliver lessons? Can I transition from an instructional teacher to a transformative teacher through this pedagogy? I believe that this consciousness has been guiding me to conduct this research as/for transformative professional development (Luitel & Taylor, 2019). In these circumstances, this study

undertakes an exploration of the intricate journey of shifting identity experienced by a mathematics teacher educator from a submissive to a transformative teacher. To fulfill the purpose, I addressed the research question, “How have I been shifting my identities from a submissive teacher to a transformative mathematics teacher educator?” Through this research journey, I attempted to answer and demonstrate how personal transformation, when guided by reflective practice and critical mentorship, can extend outward to influence educational practice and reform.

### **Theoretical Referent**

To explore my experience of moving from a submissive teacher to a transformative teacher, I adopted Illeris’s (2014) transformative learning and identity as a theoretical lens. Transformative learning is associated with the change or transformation of a learner’s identity (Baldwin, 2019). The primary aim of the transformative learning approach is to foster personal growth and drive positive change that makes a difference in contemporary society. It explains the learning process of constructing and appropriating new and revised interpretations of the meaning of an experience in the world (Taylor, 2016). Moreover, it describes how our expectations, framed within cultural assumptions and presuppositions, directly influence the meaning we derive from our own experiences (Dirkx, 1998). Transformative learning, in particular, focuses on developing capacities and changing old habits of mind, values, and belief systems to pilot reform at various levels of growth (Paudel et al., 2023). Hence, transformative learning and identity theory is valuable in helping me understand my professional experiences through a subjective lens. Understanding life experience pushes humans towards self-analysis, and they critique their values, beliefs, assumptions, thoughts, and perspectives.

### **Methodology**

I employed autoethnography as a research methodology, drawing on my personal experience (Ellis et al., 2011). I utilize my teaching experiences as an autoethnographic lens to explore and challenge the sociocultural forces shaping my identity transformation. Autoethnography provides a space to expose my experiences, emotions, and feelings within a social context, allowing for analysis through a cultural lens (Dull, 2021). This research is guided by a multiparadigmatic research design, which includes interpretivism, criticalism, and post-modernism (Taylor et al., 2012). The interpretive paradigm reveals the underlying causes and identifies human life experiences that are interrelated with subjective perspectives (Pervin & Mokhtar, 2022). In my case, Interpretivism enabled me to explore the lived experiences of my teaching and learning. “Critical pedagogy necessitates changes in educational roles, curricular content, and classroom practices to create a learning space that supports and encourages students to engage in critical commentary” (Dehler et al., 2001, p.493). Here, a critical paradigm has shown me a path to a critical outlook and the ability to reflect on my beliefs and pedagogical practices. Postmodernism has enabled me to employ multiple genres for various aspects of my beliefs, ranging from traditionalism to transformation, in different ways, including narrative, dialectical, and metaphorical logics (Luitel, 2018). These experiences helped me understand and critique the broader sociocultural contexts that influence my teaching methods and the phenomena linked to my pedagogical practices. I expressed my experience through narrative associated with my pedagogical practices, and my thoughts, feelings, and observations were ways of transforming my pedagogical practice and identity. Therefore, my data are the textual representation of my subjective experiences that helped me explain and critique the sociocultural contexts and phenomena associated with my pedagogical practices and envision the pedagogical possibilities in my professional life world.

### **Insights and Interpretations**

This section briefly discusses my different stories and experiences of witnessing a path of transformation. I have analyzed and highlighted the following theme, which closely relates to the changing role in my professional life. The themes have been generated through a rigorous discussion of my experiences.

## Transforming My Pedagogical Practice

After completing my master's degree, I began teaching university mathematics, incorporating applied rules, regulations, and pedagogy. I was walking along Habermas's (1972) path of technical interest, where the teachers were the main actors in the lesson, controlling and managing the environment. In the teaching-learning process, instead of communicating, the teacher issues a communicate in this space and makes deposits, which the learners patiently receive, memorize, and repeat (Freire, 2005). I noticed the absence of dialogue in my classroom, the dominance of lectures, and the silencing of curiosity. The curriculum is a means of cultural reproduction, and the role of schooling is to pass down implicit knowledge and values to the next generation (Shubert, 1986). This teacher-centered instructional framework dominated educational settings, shaping every aspect of curriculum and instruction. Through all these experiences of unchanging teaching and learning that were passed on to the new generation, I continued to follow the same pedagogical path. The teacher's pedagogical approach plays a vital role in effective teaching. Therefore, banking and traditional pedagogical practices need to be challenged to bring about the paradigm shift in mathematics teaching and learning (Lamichhane et al., 2023). I did not want to become a teacher confined to the same trends in teaching-learning history. I wanted to be a teacher who brings about holistic and transformative dimensions. Then, I began dreaming about how I could change pedagogical practices. How can I and my students engage in transformative learning? At that time, I pursued my MPhil to materialize my dream of becoming a transformative teacher.

*It was a bright and fine morning in March. It was 7:40 as I entered the Bachelor's level classroom. It was the beginning of the third year of the Bachelor's degree in Education, with a focus on mathematics teaching at the secondary level. Initially, I asked one student to write about the topic of mathematics and mathematics education on the whiteboard. After that, I ordered all the students to write about it individually. All the students came in turn and wrote their thoughts on the topic. To encourage the students, I began discussing the points written on the whiteboard. It was a fruitful discussion related to questions about mathematics and mathematics education. The discussion went well till the end of the class. I wondered how the class ended so quickly. Previously, I used to glance at my watch three times in other lectures, but today, I didn't have time to look at it even once. So, I realized how interesting the class was. Severe (2024) suggests that if the classroom is active and student-centered, students will be motivated to learn, and teaching and learning will gradually change. On the second day, I brought chart paper, scissors, and an instrument box, and with a smile on my face, I entered the classroom. Students were excited about what I would teach today. I told them to draw a rectangle on chart paper and find its area. The next day, I continued yesterday's class reflection and linked it with today's class. I asked them to fold the rectangle to make it resemble a cylinder, then to draw two circles on paper, cut them out, and cover the top and bottom of the cylinder with the circles. Another day, I collaborated with them to find the area of a circle and the surface area of a cylinder, based on yesterday's figure. Similarly, my practice continued with group work, collaborative and cooperative learning, project-based presentations, narrative writing, and other activities.*

As a practitioner of autoethnography, I narrated my teaching and learning of cultural contextualization. I started reflecting critically on my past teaching pedagogy and recognizing the rigidity in teaching methods. On this basis, I critically analyzed my experiences in teaching, learning, and researching mathematics education in Nepal and extracted meaningful insights from them. As a doctoral student, I have now begun to challenge the deep-seated structures of educational pedagogy, critique my past experiences, and apply critical self-reflective practices (Hughes, 2013). Based on our past and present experiences, the fundamental shift in our sense of identity centers on how we perceive ourselves in the world (Baldwin, 2019). Transformation is the personal change of any individual that reconstructs the self by going deeper into societal realities (Illies, 2014). The concept of transformation as personal change involves an individual's deep and profound shift in understanding themselves and the world around them. This process involves reconstructing one's sense of self by engaging more deeply with societal realities, resulting in enhanced self-awareness, altered perspectives, and meaningful



personal growth. By examining and questioning societal structures, individuals can challenge their existing beliefs and biases, leading to more informed and empathetic perspectives. It challenges my values, beliefs, and assumptions, which have energized me to shift my pedagogical practice. I have transitioned from being a subversive teacher to a transformative teacher educator, thereby nurturing transformative thinking and sensibilities (Panta, 2022). This critical reflection has served as a catalyst for change, energizing me to re-evaluate and shift my pedagogical practices.

### **Identity Change Through STEAM Pedagogy**

An educator's identity fundamentally molds their pedagogy. The values, beliefs, and experiences that teachers bring into the classroom influence not only what they teach but also how they empower students to think, learn, participate, and grow. Teaching, therefore, is not merely the transmission of knowledge but a deeply personal and reflective act shaped by one's evolving sense of self (Beauchamp & Thomas, 2009). We all learn different things around us every day; from learning, we construct multiple interpretations, which directly or indirectly change our thoughts, feelings, actions, and perspectives. Erichsen (2011) supports the view that how we perceive and understand ourselves, our context, and our world influences our perspectives and transforms us and our lives. This notion of perspective transformation, in which individuals critically reflect on prior assumptions and begin to view the world through new frames of reference (Mezirow's, 1997). In the context of mathematics education, identity plays a central role. Questions such as, How do we learn mathematics? How do we engage in mathematical activities? How do we understand mathematics? Reflect the link between learning and identity construction. According to Illeris (2014), transformative learning involves a structural shift in a learner's perspective, encouraging them to critically analyze their values, beliefs, assumptions, and experience, leading to personal and professional growth. Similarly, Dirkx (2012) emphasizes that transformation is not only cognitive but also emotional and spiritual; it involves the whole person and how one makes meaning in their life and profession.

I do not remember the exact date, but it was during the beginning of my PhD journey. I was unknowingly walking on the path of transformation and transformative learning. While I was striding, I felt that the 21st century is marked by technology, ushering in a technological era. Because of this, for our contemporary teaching and learning, there is a need to grow in technological advancements and a STEM approach, as there is a requirement for individuals to fill positions that will further expand these discoveries with innovative ideas. I have set this scenario to describe an event in 2020. *I was attending the class by our renowned professor at the University. He assigned us to create a STEAM-based lesson plan and asked us to present it. The lesson plan we created should promote learning through collaboration, interaction, and participation of the students, with the expectation of developing concepts and visualization in the STEAM area. This assignment made my mind revolve. This made me alert and constantly question the masterpiece of transformation that I had created in my mind. I felt as if talking and seeking transformation were easy, but it was more challenging than creating history. I told myself, "It is so difficult to make just one lesson plan, and how will it be possible for an entire transformation?" There is a saying that in every difficulty lies an opportunity. To search for this opportunity, I started creating a lesson plan. I scribbled numerous lesson plans over the course of more than a week, but I still couldn't figure out what to create. Then, finally, after one and a half weeks, I selected a geometry topic related to right-angled triangles and outlined the plan. In particular, this lesson plan was based on a right-angled triangle. The sides of a right-angled triangle are termed Perpendicular, Base, and Hypotenuse, where the hypotenuse is the side opposite to  $90^\circ$ , and it is the longest side. The remaining two sides of the right triangle are known as its legs. In the right angle triangle, the square of the hypotenuse is equal to the sum of squares of the other two sides, i.e. if  $a$ ,  $b$ ,  $c$  denote lengths of sides of a right angle triangle with the length of hypotenuse  $c$  units, then there exist Pythagorean relation  $a^2 + b^2 = c^2$ , where  $a$ ,  $b$ ,  $c$  are said to form a Pythagorean triplet. This mentioned relation will be established through the practical involvement of the students in this plan.*

This plan was designed to promote learning through collaboration, interaction, and participation

among students, with the expectation of developing concepts and visualization in the STEAM area under experimental verification in Geometry. After completion of the topic through this plan, students are expected to understand and clarify the concept of experimental verification, utilize the geometrical instruments for construction in geometry, conceptualize the experimental verification through the use of geometrical material, develop ideas for other similar experiments in geometry, visualize, and give importance to the Pythagorean Theorem in real life. The STEAM Plan, which I created, focuses on science, and students participate in observation through an experiment. The scientific method is applied in any experiment, as even small experiments have a scientific fragrance. For technology, the pictorial relationship between the sides of a right-angled triangle and the square formed from it can be displayed with the help of a projector, for additional concepts to verify Pythagoras's theorem. For engineering, students are involved in designing squares using chart paper, scissors, a geometry box, and other materials. For the Arts, students are involved in drawing various figures with the given measurements. For Mathematics, students clarify mathematical concepts as they are involved in measuring lengths of sides of right-angled triangles, calculating areas, and the sum of areas.

I created a STEAM plan of this kind during that time. In this way, I presented a lesson plan that I had developed over the course of two weeks. After the presentation session, the teacher and my colleagues gave me feedback and suggestions. According to their suggestions, a slight modification would result in a better lesson plan than the previous one. I would like to present this STEAM plan to my Bachelor-level teaching mathematics class. Coincidentally, five days after the presentation, a schoolteacher training was organized by the mathematics association, where I was invited to facilitate one of the sessions. At that time, I was so happy. I felt proud that I was valued and invited, and this became a golden opportunity to uplift my professional development. Then, I accepted the invitation with a smile right away. It was also a great opportunity to present the STEAM lesson plan that I had recently developed. So, I decided to facilitate the session with the task that had just been attempted. Accordingly, I went to the training venue at 10 am the day after the following day. I went to the training hall where I saw forty school teachers from across Nepal. When I entered the class, they all greeted me. I also greeted them, and then I began facilitating the session using the lesson plan that I had prepared, which involved all teachers participating. The teachers were also very enthusiastic and actively involved in classwork. Everything went according to my plan. All the teachers were very fascinated by my teaching approach. They appreciated the STEAM approach. STEAM education could be an alternative teaching approach to achieving the desired changes in mathematics education. "The wide areas of STEAM education offer transformative intents; these transformative intents, including arts that shall lead to continued innovative approaches for understanding STEM concepts" (Dahal, 2022, p. 1). This event marked a significant step forward in my career, as well as a shift in my pedagogical approach. I felt myself as a sun spreading rays of the STEAM approach that attempts to touch a handful of teachers across the country. This event marked a milestone in my pedagogical journey; it was both a professional recognition and a moment of personal transformation.

### **Identity Transformation Through Technological Integration**

Every day, I used to teach students new material using different pedagogical approaches and perspectives. Our current teaching and learning practices, particularly in mathematics, require growth in technological advancement, engagement, and adaptation. Technology plays a vital role in advancing the teaching and learning process in the 21st century (Wordu, et al 2020). Technology encourages teachers to engage in creative and innovative design and implementation (Gopo, 2022). The use of digital tools, such as GeoGebra, Desmos, and virtual manipulatives, enables mathematics teachers to illustrate complex ideas in interactive and meaningful ways, thereby promoting conceptual understanding and student engagement (Chalaune & Subedi, 2020). Technology encourages teachers to engage in creative and innovative design and implementation (Gopo, 2022). Reflecting on this principle, I began by participating and engaging students in a previous lesson plan to find the formula of Pythagoras's theorem using GeoGebra and verify it experimentally. We can observe in Figure 1 below that the teacher

and students are visualizing and using the ICT tools to construct the figure and find the formula of Pythagoras's theorem. In this relation, next day I asked the students about the lesson and how effective it was. They said that it was effective, and they enjoyed the use of the GeoGebra method. I could also see that the classroom was lively as students were enjoying what they were learning. I observed that all the students grasped the concept well. The students also performed well in their classroom. Bruner (1996) explains that students learn by showing, visualizing, and playing, and through the action itself. Due to the proper use of visualization through the laptop and instructional materials, the lesson was constructive. Thus, ICT serves as a catalyst for creating a better and constructive learning environment in mathematics classroom. It also gives opportunities to simplify the abstract ideas and promote a good and interactive environment. This make the learning of the student more interactive as they become inclined towards classroom activities. ICT leads to improved students' performance, creativity, and achievements.

**Figure 1**

*Some Glimpses of Practical Sessions*



*Note: This image is used here with the consent of the participants*

The involvement of teachers and students contributed to their learning through changes in classroom practice. Technology has gradually begun to advance, continually improving teaching and learning. Teaching and learning are gradually shifting towards change. In the previous days, I was not entirely sure of what I was doing, but over time, I began to learn a great deal. From this, I realized where I was, where I am, and where I am supposed to be. These different colors of pedagogy shaped me and made me who I am now. Similarly, as a mathematics teacher, I believe that the identity of any teacher is (re) formed by their past and present experience with their students, their teaching- learning environment, and their professional experience (Lojdová et al., 2021). From these experiences, certain values, beliefs, and assumptions are created in their mind. When they constantly critique their behaviors, values, beliefs, and assumptions, they are undergoing a process of transformation. In this context, Schaefer and Clandinin (2019) suggest that teachers and their experiences and life stories reveal who they are, who they are, and who they are becoming. In this process of being and becoming, teachers transform from a traditional mindset to one that is more suited to the modern world. This transformation shifts the teacher or learner identity. So, the identity is directly linked with the self. We, as individuals, are the leading actors in our life story, being the main characters in the process of identity change.

### **Conclusion and Implications**

As a PhD scholar and a university mathematics teacher, I have observed my experiences through a lens of present perspectives. I have cultivated a growth mindset that has shifted my perspective by nurturing transformative sensitivity. I have embraced imperfections as learning opportunities and modeled this mindset for my students. This helped build confidence and allowed me to explore new teaching pedagogy without fear of failure in a social context. I have set out on a journey from being a passive follower to becoming a more active and innovative teacher. This active involvement transitions from teacher-led instruction to student-driven learning, empowering students while allowing me to take on a more facilitative role. Exposure to different perspectives and pedagogical practices inspires,

reinforces, and evolves my identity, as I believe that identity is constantly negotiated and it is in the making. While walking the path of transformative learning, I have come to realize who I am and what I was practicing/attempting. Then, I visualize from my inner eyes the expansion of different colorful pedagogical practices for transformative futures. Through transformative learning, there is a shift away from conventional approaches to experiential and transformative pedagogies. This study motivates mathematics teachers and teacher educators to pursue a transformative shift in their identity.

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