Open Access

Original Article

A Brickworker Becomes Transformative STEAM Educator: Journey of Resistance, Advocacy, and Envisioning

Netra Kumar Manandhar* ID

Kathmandu University School of Education, Hattiban, Lalitpur, Nepal

Email: netra@kusoed.edu.np

Abstract

My journey from brick worker to STEAM education was/is characterized by resistance, advocacy, and envisioning. Surrounded by pains, sufferings, hurdles, and economic adversities, I spent more than 18 years in several brick factories resisting the economic vulnerabilities. At the same time, I faced tremendous difficulties in educating myself in the formal and conventional/traditional nature of educational models. The similar contexts led my upper higher education till B.Ed. in mathematics education. The duration of more than three years in my master's in mathematics education, and MPhil in STEAM education was a precious moment for me to start my journey of resisting, advocating, and envisioning life and educational practices. The journey from a brick worker to STEAM educator was the biggest challenge for me. I accepted the challenges put by my life and education system and tackled them to become more skillful, knowledgeable, and aware to solve them and develop alternative practices which are more authentic, open, critical, empowering, and inclusive for myself and others. Thus, this research portrays my journey of resisting disempowering educational practices, advocating progressive and empowering practices, and envisioning a transformative educational perspective via autoethnography as a methodology and transformative learning theory as a theoretical referent. The research is useful for educators and others to bring quality and meaningful changes in educational practices for sustainable development in education and life.
Keywords: Brickworker. Resistance. Advocacy. Transformative education.

Introduction

This paper portrays my journey from a brick worker to becoming a STEAM educator characterized by resistance, advocacy, and envision with the aim of changing the perspectives and practices of education to embrace empowering and meaningful lifelong education. The paper incorporates my shift from an individual who faced tremendous economic hardships and difficulties in poverty consisting of hurdles, pains, sufferings, excitements, changes, and many ups and downs to a person who has become an educator who encourages people to change their educational perceptions, beliefs, and practices. I started this journey by depicting my childhood involved in several brick factories as a child labour and labour and my educational journey at the same time. I elaborated on this journey filled with economic, physical, and psychological vulnerabilities to make readers aware of my upbringing as a child and a person.

After this, I assessed the educational practices during my school and higher education till bachelor's in mathematics education from critical theory perspectives. This represents my experiences and understanding of the education system filled with un/helpful disempowering and hegemonic belief systems and assumptions by practicing the banking model of education (Freire, 2005). Here, I portrayed my lived experiences and made a critical explanation with a heightened consciousness by using research as a resistance metaphor. Henceforward, I portrayed my experiences of studying at Kathmandu University, which gave me a platform to rethink educational practices from the transformative educational lenses. This was the point when I started critically examining my system of thinking, believing, and valuing related to my existing practices and developing new but empowering perspectives of education and life. Since then, I started working in the field of education to change it for the public good. I have discussed this journey by using research as advocacy and change perspective.

The paper also incorporates my journey of being and becoming of a STEAM educator by presenting a vision of STEAM education that incorporates integrated curriculum and emphasize on providing education with transversal skills, values, and attitudes. I discussed this from the perspective of research as an envisioning perspective. Therefore, the central purpose of this paper is to depict my journey from brick worker to a transformative STEAM educator. The guiding research question is: How have I been travelling my journey from a brick worker to being a STEAM educator to advocate and envision an education system for meaningful and lifelong education?

My Journey in a Nutshell

How is the change possible? Is it possible for a person to adapt to change in a continuous obstruction in life? For me, change is possible when I face challenges and hurdles in life. Likewise, change is possible when one encounters devastating moments in life such as a pandemic, economic crisis, poverty, losing dear or near ones in an accident or natural disaster, major health issues, motivations, and many more. This is the context in which I find myself evolving to think and work to make my and others' lives better.

Life has put me into several vulnerabilities related to poverty, physical and psychological health issues, hunger, and a great load of responsibilities. I am not saying these moments of my life were good or bad, but I consider these as opportunities that helped me evolve and be a better version of myself every time. These were the critical turning points in life by which I learned to stand and fight back. Sometimes these weakened/broke me from inside, but most of the time, these challenged me to improve myself, my knowledge, and the skills that I think/thought essential to survive in this complex world. From the economic viewpoint, I was under the domination of poverty and an economically oppressed system. It was difficult for my family to fulfill our basic human needs, which prevented me from reaching

the higher levels of Maslow's hierarchy of needs: belonging, esteem, self-actualization, and self-transcendence (not sequential, however).

From birth to till 18 years of age, I spent half of my life in several brick factories. As child labor, I had to go to the brick factories in Kathmandu, Bhaktapur, Lalitpur, and other parts of Nepal with my parents for six months every year. For the next six months, my family used to be in the village (my hometown), where we did not have sufficient land for our survival, so brick factories were the only sources of our income. I used to work with my parents in the brick kilns during an extremely cold season. From 5-year of my age, I involved in brick-making processes by supporting my parents in managing sands (a special mud used in the brick making process), cooking foods, preparing clay, carrying and making clay, flipping bricks, and carrying bricks from the field to the respective piles for the finalization of raw bricks. We had to do these tasks for about 14 to 16 hours every day. In these difficult times, the continuation of formal education was impossible for child labors in brick kilns (Save the Children, 2016). During my stay in the village, I finished my school education by attending school for five to six months and participating in the final exams to upgrade to higher grades. Even in such hardships, my parents understood the value of education and sent me to school.

Besides brick factories, I accomplished several so-called impossible tasks in the formal education system. By attending school for only six months, I used to come in the top position (first or second) in every final examination. However, the nature of our education, which used to overly focus on 'memorization and rote-recall' as a divine way to evaluate students' cognitive abilities, had supported me in doing these impossible tasks. On the other hand, my trust and belief in education and the motivation of my family, relatives, and teachers made me do such outstanding performance because I internalized education as a problem-solving approach to my economic vulnerabilities. This belief might be one reason that helped me get academic success.

After completing SLC (School Leaving Certificate) exam, I decided not to continue working in brick kilns. This led me to be a tutor of mathematics while doing my 10+2 (intermediate) in mathematics education. I used to take tuition classes for earning purposes to pay college tuition fees and fulfill everyday needs. After 10+2, I moved to the capital city of Nepal, Kathmandu, to complete a bachelor's in mathematics education.

During 15 years of my academic journey, I had several dissatisfactions with the education system of Nepal and like. The more academic level I reached, the stronger my negative attitudes and perceptions were toward the system. I started having some negative perceptions towards the contemporary model of education, which was/is governed by some decontextualized nature of the curriculum and curricular practices, linear and dessert-like pedagogical approaches, and summative assessment as a central evaluation system (Luitel, 2009, 2013; Pant, 2015, Shrestha, 2018). After these many years, I found myself a disabled human being with very few or no practical skills to apply in my field and other human values essential for my easy survival.

Due to this dissatisfaction, in 2016, I switched to the university for my higher study. This decision became another turning point in my academic life in developing skills and knowledge useful for the 21st century. Finally, in 2019, I joined STEAM Education program at Kathmandu University and became STEAM Educator. This was a journey from brick labor to a STEAM educator who is now working for the quality change in education with the central emphasis on holistic education for all. Here, my dream has transformed into being a leader and educator to advocate STEAM education as a transformative education system.

Transformative Learning Theory as a Theoretical Referent

What might be the best way/s to bring changes in me and society for the betterment? What beliefs, values, assumptions, and traditions are associated with my lifeworld and educational practices for resistance, advocacy, and envisioning? How/why did/do people promote hegemonic, pedagogically oppressed, culturally decontextualized, and disempowering practices, and what would be the alternatives? These are some most echoing questions that guided my thoughts and practices. These questions seem to be the extension of my present reality in which I am thinking about myself and others relating to the theory of transformative learning (Mezirow, 1991).

In this context, every learner can be critically reflective on the deep-seated and long-rooted beliefs, values, intentions, and attributes (Mezirow, 1997, as cited in Pant, 2017). Here, the critical reflection can be helpful in understanding and raising the questions against existing dominant and unhelpful schemas and a set of beliefs and always seeking better alternatives. Mezirow (1991) states that transformative learning theory is a process by which we transform our 'taken-for-granted frames of reference to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove truer or justified to guide action' (p. 133). With this, I always try to improve my practices by critically reflecting on my deep-seated false consciousness about the nature of the curriculum, pedagogy, and the whole education which I have experienced as a learner, teacher, and teacher educator. In this regard, I believe that meaning is constructed through learning, reflecting, and dialogue. Transformative researchers "draw on constructivist, critical, social and arts-based epistemologies to examine reflectively, critically and imaginatively their lived experiences revealing the historical and sociocultural framing of their personal lives and professional practices" (Taylor, 2013, p. 2). My journey from brick-maker to STEAM educator was a transformative movement that has the attributes of the theory of transformative learning, such as learning by reflecting on vulnerabilities, hardships, and resistance to disempowering belief systems, etc.; advocating inclusive and empowering belief systems and taking actions; and educating people for the transformative change to envision a better practice.

Research Methodology

I am telling my stories filled with resistance, advocacy, and envision associated with my journey from labour in brick factories to STEAM Educator. I should be aligned in between representing both my culture of education and my lifeworlds being a storyteller, narrator, and interpreter to depict my scenarios to the reader considering 'self is subject to look into and a lens to look through to gain an understanding of societal culture' (Duckart, 2005, as cited in Chang, 2016, p. 49) so that they can consciously understand me and my culture through multiple perspectives and interpretations.

I have selected autoethnography as a research methodology and multiparadigmatic research paradigm (Taylor et al., 2012), combining interpretivism, criticalism, and postmodernism for this project. I used interpretivism to portray lived experiences of my culture and self and develop context-based interpretation; criticalism to bring forward the critical discourse of hegemony, status-quo, disempowering belief system, etc.; and postmodernism to depict narrative in a literary manner (e.g., stories). I used autoethnograpy which is made by three interconnected triadic terms auto (self), ethno (culture), and graphy (research process) to portray 'selfhood, subjectivity, and personal experience ("auto") to describe, interpret, and represent ("graphy") beliefs, practices, and identities of a group or culture ("ethno")' (Adams & Herrmnn, 2020, p. 2). Ellis (2004) defines autoethnography as 'research, writing, story, and method that connects the autobiographical and personal to the cultural, social, and political'

(p. xix). These texts are usually written in the first person and feature dialogue, emotion, and self-consciousness as relational and institutional stories affected by history, social structure, and culture (Ellis & Bochner, 2000). This means that the researcher is always at the intersection of culture and self in the research process. In this process, I, as a researcher and research participant, and my culture are the subjects to be researched. Meanwhile, I am only a communicator and storyteller (Ellis & Bochner, 2006). Throughout, I portrayed my lived experiences through narratives of resistance, advocacy, and envisioning; and made meanings and interpretations. These emerged from my experiences as labor in brick factories, a learner and teacher in educational contexts, and a STEAM educator by being critically reflective, believing that this method serves concrete action, emotion, embodiment, self-consciousness, and introspection to craft my journey as an autoethnographer (Ellis, 2004; Chang, 2016). As a method, autoethnography combines autobiography with ethnography (Ellis et al., 2011, as cited in Cohen et al., 2018), and Chang (2016) argues that it should be ethnographic in its methodological orientation, cultural in its interpretive orientation, and autobiographical in its content orientation. Thus, autoethnography is 'a self-narrative that critiques the situatedness of self and others in social context' (Spry, 2001, p. 710). Therefore, this research method is helpful to present my living stories to the audience and make meaning of the social phenomena in which I interacted as an insider.

Research as Resistance

I used 'research as resistance' concept to investigate my lived experiences that presents my confrontation and disagreements with the educational scenario besides my life in vulnerabilities. In this section, I am raising my voice through critical discourse against the education system I was/am involved in as a teacher, student, and teacher educator.

Story 1: Dissatisfaction with my Learning

The practice of rote learning and spoon-feeding nature of education started from my early schooling. When I was in grade one, one lady teacher used to teach us mathematics. After teacher-student greetings in one fine morning, the teacher said to us, *"Dear children, today we are learning counting numbers from 1 to 20. So, I am writing the numbers on the blackboard."* She then said, *"Now, I read these numbers and you have to repeat after me with a loud voice, OK?"* We said, *"OK miss."* We repeated the same process four to five times in the entire period. At the end, the teacher gave us the homework to read those numbers and tell them in the next day's class. In a similar manner, I rote-recalled the numbers till 100 and more in grade one, and the learning procedures were similar for other contents and subjects.

When I was in grade four, I used to be afraid of our mathematics teacher, who used to come to school drunk and beat academically poor students when we could not recall the information kept in books given by him or to do the homework. It might be any day in the summer of 2001. The teacher commanded us to read the definitions of solid objects, the number of their faces, and edges. Within seven to 10 minutes, I tried to memorize as much as possible because I had to save myself from the teacher's cruelty and physical punishments. My friends would do the same. We finished the memorization task, and then the teacher started asking the question one by one. When he was asking other students, I was inaudibly remembering and mugging up as much as I could. My turn came. Thank God! I could recite the information accurately and save myself. Now, it was the turn of Mr. Prayas, my friend who was known to be weak in mathematics and English because of his below-average performances in the previous examinations and his weak memorization ability. The teacher asked, *"Prayas, tell me how many edges a cylinder has?"* Prayas could not make it, and he might be looking here and

there with a frightened face and said, 'one, …., no-no, …., two, ……' The teacher got angry, and he said, *"You rascal, scoundrel, poor fellow. How could you not even memorize this much information? How will you survive in this world with such a memory? Go and look after goats, oxen, cows, etc. or do household work. You can do nothing in the future. Go 'Kathmandu' (the capital city) to carry sacks with cement or wash utensils in hotels or restaurants. Your future is finished."* The teacher slapped the students and beat with a long and thick stick. With that stick, he shattered Prayas' head. Prayas got injured, and the blood was coming down from his head. Prayas started crying, and I was extremely frightened by seeing those activities. Finally, the teacher called a female teacher and told her to apply the medicines to the wound. This was a horrible incident for me.

The rote-memorization and business of copying-pasting were the prevalent learning methods in my journey of learning and teaching till bachelor's in mathematics education. This refers to the reproduction of knowledge and skills rather than the creation. The practice of the copying-pasting method was more dominant in my bachelor's studies in one of the renowned universities of Nepal, Xerox University (A pseudonym). Textbook writers were/are copying the information from other textbooks (generally, textbooks foreign writers) and pasting them into their textbooks. Teachers were/are copying the information from those textbooks and pasting it on the black/white boards. Finally, students were/are copying the same information from black/whiteboards/textbooks/notes and pasting them on the blank papers in the final examination. This copying-pasting business starts with textbook writers and ends with examination as the final battle for students. In the second year of my study, one of the lecturers used to teach us 'Analysis' subject who used to copy everything from the textbooks even without leaving a single comma. His usual words to us would be, *"There are the theorems and their proofs proved by the genius and great mathematicians. The questions will be asked from only this book. The examiner will use this book to check your answers. If you write the same without leaving a comma, you will get full marks; otherwise, your marks will be reduced, or you will even not get the marks. So, practice copying the things as they are."*

In 2013, I encountered another teacher in my third year. When raised questions, *"Sir, in this way, how can I understand these theorems and their proofs? What will be my future if I do my study this way? What are practical real-world applications of them?* The teacher's answer would be, *"You are here to get an academic degree, and my job is to teach you and finish the course in time. I have 15 years of teaching this subject, and none who raised such questions against my teaching method. The student used to get above 90 out of 100 in my subjects. I am one of the members in finalizing the questions for your final examination. Just copy what I have taught you. Practice them unless you cannot memorize everything. Finally, you have to write what I have written in the class in the final examination. Regarding your future, learn these things when you become a teacher. Therefore, no queries. Just do what I said."*

Extending the Discussion…

Till B Ed in Mathematics education, I was in an education practice wherein I had to perform various learning tasks under a teachers'-controlled environment and teachers-led summative examination driven approaches. Such an environment focused on rote learning, memorization, copying-pasting, and stimulus-response binary system for achieving good marks and grades. I travelled a painful journey in the educational system that emphasized a huge collection of information kept in textbooks and guidebooks, and achievement of the highest scores are everything for a student that seemed to have less or no connection with real-world application. The education seemed merely a system of reproducing the other's texts, information, and facts, stopping students from raising out-of-track questions. That's why I did not have hope from this

education practice to resolve my economic challenges; be an innovative, conscious, and critical human being; and become an agent of change. As a teacher as well, I also followed the footsteps of my teachers in teaching my students. The education system used to be guided by the Banking model of education wherein pedagogy seems to be a process of depositing the knowledge into students' minds so that it can be used in the future as money, just as deposited in the bank can be withdrawn in the future for several economic purposes (Freire, 2005). The situation used to be even pathetic in mathematics and science subjects. Besides my financial difficulties, my school education was another challenge for me. Thus, I always had dissatisfaction and discomfort with the education I experienced even though I had done excellent academic performances without/less 21st-century skills, which are extremely useful for our survival.

From the school education, the linear approach to learning was prevalent, centralizing to rote-recall, reproducing the truths and facts, algorithmic problem-solving methods, and developing technical and procedural ways of learning (Luitel, 2009; Shrestha, 2018; Manandhar et al., 2021). I had no such learning experience where my teachers used to do practical tasks except for preparing chart papers that included truths and formulae and pasting on the classroom wall. I do not remember the incidents of taking us outside the classroom to explore beyond the school and textbook environment. Ultimately, the learning was confined to four classroom walls and so-called expert-prepared textbooks. Students are likely to be passive receivers and reproducers of knowledge and skills within this education system without developing transversal skills. Students develop routine problem-solving skills by using given and algorithmic procedures, rules, and strategies which leads to the production of procedural fluency (Rittle-Johnson, 2019; Manandhar et al., 2022), wherein they cannot solve the complex and real-world problems. In the controlled environment, students did not get the opportunities to discuss, communicate, share, question, and explore the world beyond the four walls of the classroom. The teachers seemed to follow (still following) technical rationality (Habermas, 1972, Grundy, 1987) to educate people. The 'practice makes one perfect' and 'one-size-fits-all' system focuses on solving the algorithmic and most important questions for examination that reduce the possibility of making mistakes and encourage competition rather than collaboration. In such a learning context, students are not allowed to ask beyond the syllabus questions. If they asked, teachers enjoy telling 'you-will-learn-in-the-future' (Luitel, 2009) statements.

In such a context, students are not provided with a rich environment to explore and connect the ideas to their living world, which may generate multiple epistemic contexts to learn. For example, I was from a Brick-making world background, but I did not get opportunities to link the concepts to my world. I have experienced as a student and teacher that the learning process is boring and creates a huge dissatisfaction among students. This could be because examination-driven and paper-pencil tests for evaluation and ignoring the arts-based pedagogies in teaching and learning. So, in my master's and MPhil education, I have started resisting the educational practices that oppressed the students' creativity and 21st-century skills.

Research as Advocacy

A sense of dissatisfaction with my academic achievement and the skills I developed till bachelor's led me to switch to the university for my higher education. By involving in the process of getting higher education at Kathmandu University, I started critically reflecting upon people's belief, values, and practices associated with Education. I involved in developing the knowledge and skills required for a teacher and educator to transform educational practices to embrace a more progressive curriculum, assessments, and pedagogies; advocating a progressive and holistic model of education; and finally becoming an agent of change. Here, I discuss some of my narratives about my advocacy for an educational model.

Story 2: Advocating new Avenues in Education

I encountered the word 'contextualization' for the first time when I was doing my MEd in mathematics education. After attending some lectures by professors; attending a few seminars and workshops, and reading papers, I was able to understand the value of it for meaningful learning. Particularly in developing mathematical knowledge and skills, I tried to research the contextualization of mathematics in our contexts of living, being, valuing, and becoming. I started exploring our living contexts in which mathematical knowledge can be contextualized and practiced. During this period, I found that this education model might help reduce the domination of decontextualized education and promote local knowledge, wisdom, and tradition.

I started reflecting upon my non-educational contexts (brick factories, Newari culture, etc.) and tried to relate academic contents and concepts. The contexts of brick factories were rich in providing real-life experiences of learning and problem-solving. I found that the tools and objects used in brick factories such as 'Kodali', wheelbarrows, bricks and bricks making tools, a hut made by raw bricks and tins, patterns in piles and lines of bricks, chimneys, etc. can be extremely helpful as ethnomodels to learn several concepts of mathematics, science, and other subjects. As a student, I could learn by connecting and modeling the concepts with the help of those objects. I learned that my experiences in those brick factories were filled with 3C's (contexts, concepts, and contents) of mathematics and other subjects. They might have not been linked or integrated by formal education. They could be my funds of knowledge (Moll & Gonzalez, 2004), but mathematics and other subjects' curriculum did/do not appear to have access to my world or culture. The interconnectedness of learning and context appears to be essential for developing rich experiential learning. Most of the holistic educators (e.g., Dewey), who advocated for experiential learning, claim the need for the integrated, interdependent, and interrelated learning for holistic learning in which learners interact with the world, draw connections, seek relations, and construct meaning. For Dewey (1940), learning is an act of thinking, and thinking as a process of making connections and forming relationships, a process of making and connecting links explicitly in the form of relationships. In this line, I also consider that experience awakens learners' curiosity and incites them with a desire to understand the phenomena; consequently, learning can happen through connections. After this awareness, I started using some of the models in teaching my students, and I developed projects for them to explore their contexts and relate academic disciplines to their living world. Being a teacher educator, I teach and facilitate teachers through the perspective of integrated learning rather than fragmented learning. I advocate for holistic and progressive education in my teaching the teachers by emphasizing transdisciplinary curriculum and learning with the help of project-based and inquiry-based learning methods. In this phenomenon, the contextualization of learning emphasizes the rich connection between the real-world contexts of students and academic disciplines.

In the context of promoting and advocating a holistic and progressive vision of education, I encountered the value of arts to make learning engaging and meaningful. I belonged to a family and a community with a rich cultural identity and arts-based activities. I participated in several cultural activities filled with music, dance, poetry, songs, etc. From an early age, I had an interest in the field of arts. My deep interest was in arts, such as writing poems and songs, performing dance and dramas, creating arts-based designs through technologies and other materials, etc. However, I hardly/never experienced them in regular classroom practices when it comes to formal education. The conventional and disciplinary centric model of education was/is likely to kill my artistic intelligence by overemphasizing on dull and repetitive routine tasks that make little or no claim on my attention or demands on my artistic intelligence by encouraging me to limit myself in getting good marks/grades on tests or

to impress someone as discussed by Holt (1964, as cited in Rudge, 2008). One of the emerging debates in ongoing educational discussions is the integration of arts in teaching and learning practices, one of the major principles of holistic education (Nakagawa, 2018) from the Eastern worldview of holistic education, which are the primary means for self-transformation by pursuing the higher self. Similarly, from the Western worldview, experiential learning integrating arts is the primary means to reach the holistic development of a person (Forbes, 2003). For instance, teaching basic geometrical shapes and solids by involving students in painting and sculpturing, teaching the social inequalities through stories and dramas, conducting a project wherein students can shoot videos using a camera and edit with designing software, and teaching the idea of force through drawing and theatre, developing songs or poems for learning formulae or definitions, to illustrate a few can be a great approach for meaningful learning. Thus, arts can be used as a methodology or pedagogical tool to perform the learning activities (Goldberg, 2017), which makes learning engaging, thrilling, curious, motivating, and eventually meaningful. Similarly, to transform the human consciousness, arts could play a crucial role which is not only the way of creating performances and products; it is the way of creating our lives by expanding our consciousness, shaping our dispositions, satisfying our quest for meaning, establishing contact with others, and sharing a culture (Eisner, 2002). Influenced by this perspective, I was interested in educational transformation with integrated, inter/transdisciplinary, and arts-integrated educational models such as STEAM education.

In the changing time and context, I advocate a progressive and transformative version of the curriculum. This appeared to be a radical shift in my understanding from the traditional nature of the curriculum, which is informing, contents loaded, expert-driven, centrally designed, and culturally decontextualized. During my intermediate (10+2), I developed the notion of curriculum as a textbook or a subject to be studied. When I was at my bachelor's level, I developed the notion of curriculum as a list of contents since contents were/are considered to be the drivers to conduct the whole academic year. Perhaps, the initial phase of my teaching career went by following the textbook, imitating my teachers by pursuing their legacy of teaching, and finishing the course of contents in the allocated time.

In 2016, in the second semester of MEd, there was a course called Curriculum in Mathematics Education. This time, I interacted with Schubert's (1986) curriculum images, which could provide me with a contextual orientation to understand curriculum through metaphors, and this, therefore, might become the turning point to shift my beliefs of traditional views of the curriculum to understand curriculum through multiple lenses such as informing, reforming, and transforming. Initially, my beliefs regarding curriculum were governed by 'informing' notions or traditional views of curriculum: curriculum as a list of contents, as cultural reproduction (i.e., reinforcing established classroom and social standards and power structures), and as discrete tasks and concepts as discussed by Schubert (1986). These curriculum images emphasize curriculum as a material or body of texts and as an end where students are means to accomplish their goals and objectives. This is likely to be aligned with the reproduction outlook that seeks the status quo, generating a normative, controlled, and manipulative product. So, *is this sufficient for 21ˢᵗ-century education? Does such a curriculum address the needs of learners, society, and the world and make learners responsible? How?*

After this awareness, I started to advocate curriculum as a process from a reforming perspective which seems to challenge the traditional nature of the curriculum by embracing the reform in individuals and society by associating with progressive education that believes in experience and activities promoting meaning-making through interpretation. John Dewey's experiential learning can be considered while developing this curriculum. Dewey (1892) advocates that curriculum should reside in a means-ends continuum wherein curriculum is taken to facilitate students learning (ends) and where experience is considered an integral part

of both process and outcomes in educational practices. I put curriculum as experience (building knowledge and skills based on students' prior experiences) discussed by Schubert (1986) in this category. Similarly, my focus is on a curriculum with a transformative vision and mission, which is likely to answer the question: *what about an individual's autonomy and responsibility? Are students conscious of what is happening in their society? Are students critically aware of what actions they are performing in their everyday life?* For this, I consider curriculum as a means for the holistic development of a learner and society. So, curriculum as social reconstruction and as currere are keen to address such issues.

Curriculum as social reconstruction could be effective to re/construct society for people and other living beings to make it a better place. Its education's role is to prepare human resources capable of solving existing problems in society, cultivating the awareness to advocating against unjust assumptions, cultures, and rules and regulations. Moreover, I consider curriculum as currere is helpful for each learner to recognize themself, learn from the past through self-reflection practice, and create visionary directions for the future. This is, I consider, for fostering personal development, analyzing past actions, and envisaging possible prospects (Pant, 2015). Here, learners actively construct meaning freeing themselves from the coercions by understanding their abilities to thrive and become visionary people. These two curriculum images are aligned with emancipatory human interest as discussed by Habermas (1972) where critical reflection comes alive while we turn our ego into ourselves by raising the critical questions against our existence by freeing from unfree existence and structure and by taking responsibility for every action we perform.

With the awareness of the value of progressive and innovative pedagogical approaches such as project-based, inquiry-based, context-based, cultural-based, arts-based, etc., and the curriculum mostly governed by reforming and transforming images and integrated learning, I started advocating for the same educational model and practices for producing conscious and responsible citizens having required 21st-century skills.

Research as Envisioning

In conquering hardships and vulnerabilities and making lives better, I tried to envision my life differently. I tried to dream big and create my own path to reach my vision, and I think I could achieve most of them. Creating a new and different vision was/is a challenging task for me because I needed to immerse critically, creatively, and imaginatively in 'things as if they could be otherwise' (Green, 1995, p. 16). My journey from brick worker to STEAM educator had filled with visions and dreams. As a conscious and transformative educator, my job was also to envision inclusive and empowering alternative perspectives and practices. Here, my sincere concern is towards the use of educational research to develop a vision that holds the sustainable development characteristic – is a process of transforming the learner's (including teachers and others) habituated ways of knowing, acting, and valuing rather than inculcating the basic knowledge/skills (Luitel & Taylor, 2019). After experiencing a disempowering educational model, I put myself to designing a STEAM Education which is likely to be helpful in solving the existing problems of education.

Story 3: Envisioning a STEAM Educational Model

I envision the curriculum as integrated and holistic rather than compartmentalized and fragmented. In a compartmentalized curriculum, the educational practices seem to separate students' lifeworlds and academic disciplines as if they are from segregated planets in which students study subjects with separate teachers. Students are forced to learn narrowly conceived and bounded criteria or objectives of the separate subjects. In such a context, a student who is

learning mathematics does not see the connection while learning the concepts in science; however, they are interconnected. Moreover, students are not able to experience the real-world application of those ideas and skills learned in formal academic settings. So, our education has a big failure as there are issues such as disengagement, disinterest, negative attitudes, rising dropout rates, unemployment, etc. As a result, that could be a factor to negatively affect the progress of an individual as a person, society, and the world.

Being a STEAM educator, my vision of STEAM curriculum is governed by the notion of interconnectedness guided by a holistic educational philosophy that every element in this world is interdependent. This is true that we all are the parts of the same intricate web of life, the notion that there is a purpose for every life in the universe, and the conviction that there is a continuous plan of evolution in which we are all involved (Nakagawa, 2018; Rudge, 2008). My curriculum vision includes the three forms of integrated curriculum: multi-, inter-, and trans-disciplinary. The first is the least integrative form of integration, which involves more than one discipline's knowledge, processes, and skills through thematic integration. For example, 'kitchen garden' could be a theme. In this, the teacher can teach several concepts of science (soil, plant, environment, etc.), mathematics (area, height, patterns, numbers, basic operations, etc.), engineering and technology (designing the plot, researching through the internet), and arts (making garden appealing to other or could write poems/songs or make a painting of beautiful kitchen garden, the humanity of being together, etc.). Thus, the subjects or disciplines are organized in a theme rather than an orientation toward an authentic problem (Wickson et al., 2006).

Second, the interdisciplinary nature of curriculum integration emphasizes on common interdisciplinary skills and concepts embedded in disciplines wherein knowledge is socially constructed having many right answers (Drake & Burns, 2004; Drake & Reid, 2018). In this, students and teachers involve themselves in collaborative projects to address specific 'everyday' problems and, as a result, encourage students to create new knowledge across the disciplines to cross boundaries (Stock & Burton, 2011). The transdisciplinary nature of the curriculum is the central focus of my curriculum vision. It focuses on a real-world problem-solving approach (e.g., through project-based learning) wherein students are encouraged to develop life-affirming skills as they apply interdisciplinary concepts and skills in a real-life context (Drake & Burns, 2004). This might often go beyond the disciplines while producing a new perspective (Gibbs, 2015). While solving authentic problems, students could develop creativity, ingenuity, curiosity, imagination, critical thinking, productivity, and accountability.

STEAM approach is the pedagogical approach of my vision. The STEM (without arts) seems to be producing human resources who are capable with knowledge and skills to work in highly competitive and high-tech STEM-related workplaces (Taylor, 2016; Hardiman & JohnBull, 2019; Aguilera & Ortiz-Revilla, 2021). But I firmly believe that without *creativity, ingenuity, critical thinking, and imagination, how to engage students in STEM activities expecting innovative ideas and products from them? Amid crises of humanity and ethical behaviors towards everything in this world, how can STEM be a program to cultivate such values and ethics?* So, the integration of A is a must. Combining STEM and arts enables people to create an 'interdisciplinary STEAM curriculum for designing transformative pedagogies that develop students' disciplinary knowledge/skills and awaken their creative self-consciousness, elevate their moral/ethical and spiritual awareness, and empower them to practice environmental justice' (Taylor & Taylor, 2019, p. 1). This might become empowering in terms of education for sustainable development that is guided by an educational philosophy based on a broader spectrum of the public good (Hazelkorn & Gibson, 2017). Similarly, I agree with Colker and Simon (2014), who argued that STEAM helps teachers incorporate diverse disciplines and promote learning opportunities/experiences that allow young children to explore, question, research, discover, and exercise innovative building skills. Stroud and

Baines (2019) contend that the traditional model of STEM education gives the emphasis on the theoretical understanding of solutions to real-world problems, however, the arts-integrated STEAM education gives diverse ways for capturing the essence of an endeavor, reframing experiences, and transformative perceptions (Pant et al., 2020).

My vision of assessment emphasizes using more progressive and transformative forms of assessment such as assessment as/for learning centralizing to more formative assessments. The authentic assessment is one of them which is useful for direct measures of real-world applications; capturing constructive nature of learning; integrating teaching, learning and assessment; and providing multiple paths to demonstrations (Mueller, 2005; Bagnato, 2007). The information could be captured from multiple methods while performing the authentic assessment. Similarly, self-assessment and peer-assessment are the highest priority which are crucial to encouraging students to take charge of one's learning by supporting students to develop metacognition.

I envision school as another home for learners in my vision. So, I support schools with rich learning resources with labs, makerspace, library, etc. through which STEAM pedagogy can be implemented through the project and inquiry-based learning methods. In my vision, a school is a place for students to further their development in diverse areas. For this, providing multiple opportunities to participate in extracurricular activities is imperative. This consists of debate, cultural programs, arts-based activities (performative arts, visual arts, linguistic arts, liberal arts education, etc.), and sports activities all connected to integrated learning experiences. By this, I mean, these activities in the STEAM learning environment might be connected to curricular activities to make learning contextualized, thereby fostering creative thinking and innovation (DeJarnette, 2018; Harris & de Bruin, 2017).

I consider a teacher as a lifelong learner in my vision. I envision teacher as a problem creator/presenter and solver, teacher as a researcher, teacher as a transformative being which is a radical perspective coming from transformative adult learning theory encouraging teachers to bring perspective transformation in thoughts and actions in the teacher's profession through critical self-reflection on our long-rooted belief systems, hegemonic traditions, predispositions, and status-quo, or frame of references (Mezirow, 1991, 1997; Kitchenham, 2008), teacher as a collaborator in learning, etc. are the major attributes of teacher in my vision of STEAM education.

Concluding Remarks

In the process of being, becoming, living, and educating, I travelled a journey from Brick worker to STEAM educator filled with ups and downs, critical moments, un/successful stories, resistance, advocacy, envision, etc. The situations taught me how to survive in difficulties, fight the challenges, and finally learn from it to start a new avenue of life. I got critical awareness on my academic achievement when I joined KU and started critically reflecting on my practices, beliefs, and journey as a student and teacher of mathematics. I raised several questions such as: *Was that a meaningful journey? Did I develop knowledge and skills that are applicable for solving my challenges and problems? Did my education help me to be a competent and aware citizen for the 21ˢᵗ-century?* By researching, I found that I was under the unhelpful and disempowering educational practices which dominate students' creativity and critical thinking. Learning by rote-learning and memorization was prevalent in my educational journey because I prepared to get extraordinary marks/grades in the final exams and competitions. This hegemonic tradition of education probably killed my creativity and innovation skills

The educational practices governed by the conventional model are prevalent and emphasize on decontextualized, culturally detached, fragmented, and real-world detached

curriculum and curricular practices. Students are likely to develop negative attitudes and anxiety towards education system because they are not able to see the real-world applications of knowledge and skills they receive from school and university. The continuous increased rate of failures in national examinations and national assessments (e.g., Education Review Office [ERO] (2015, 2018)) indicates that the education system is paralyzed and reproducing students useful for 17th or 18th centuries because they seem to be incompetent in the local and global market of education, industry, and other.

In this paper, I articulated my journey of resisting the conventional educational model, advocated for empowering and encouraging educational practices, and envisioned a transformative educational practice. As a teacher educator, I advocated for a contextualized model of education that emphasizes on 21st-century skills for the students, real-world application of knowledge and skills, and preparing critically aware citizens who think and work on social reconstruction and reform by becoming conscious agents of change. For this, I advocated for curriculum as social reconstruction, as experience, as currere; integrated and STEAM curriculum and pedagogical practices which include discovery, experiential, design thinking, innovation, inquiry, creativity, critical thinking, communication, and collaboration such as project-based, inquiry-based, and problem-based learning, etc. To execute this, I envision a model of education as a STEAM Education.

Implication

I accept that Freire's problem-posing education model is appropriate for coming out from the banking model of education. The prioritization and advocacy for progressive teaching and learning methods and model of curriculum seem to be effective in solving the existing problems in education. For me, this research is useful as I articulated my journey of being, becoming, living, and educating myself and others. I got enough space in this research to reflect on my values and practices, which helped me transform myself to embrace more empowering and helpful visions of life and education.

You are the people who are re/searching for a change in education. This research might be useful for you to think about the present context of education critically, and the paper might give you alternative solutions. The educational perspective I am advocating for might be useful for your starting point of you being a change agent in education. Believing in 'together we can' perspective, I am requesting you to be a part of the resistance of disempowering practices, advocacy of progressive model, and envision a transformative vision of education. Keeping critical self/reflection and transformative sensibilities and abilities at the heart of the change, we can reform this education system for us and our future generations.

Acknowledgments

ORCiD

https://orcid.org/0000-0002-9034-0847

List of References

Adams, T. E., & Herrmann, A. F. (2020). Expanding our autoethnography future. *Journal of Autoethnography, 1*(1), 1-8. https://doi.org/10.1525/joae.2020.1.1.1

Aguilera, D., & Ortiz-Revilla, J. (2021). STEM vs. STEAM education and student creativity: A systematic literature review. *Education Sciences*, *11*(7), 1-13. https://doi.org/10.3390/educsci11070331

Bagnato, S. J. (2007). *Authentic assessment for early childhood intervention: Best practices.* The Guilford Press.

Chang, H. (2016). *Autoethnography as method.* Routledge.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education.* Routledge

DeJarnette, N. K. (2018). Implementing STEAM in the early childhood classroom. *European Journal of STEM Education, 3*(3), 18. https://doi.org/10.20897/ejsteme/3878

Dewey, J. (1940). *Education today.* G. P. Putnam's Sons.

Drake, S. M., & Burns, R. C. (2004). *Meeting standards through integrated curriculum.* ASCD.

Drake, S. M., & Reid, J. L. (2018). Integrated curriculum as an effective way to teach 21st century capabilities. *Asia Pacific Journal of Educational Research*, *1*(1), 31-50.

Education Review Office (ERO). (2015). *Report on national assessment of student achievement (NASA) 2013*. Authors.

Education Review Office (ERO). (2018). *Report on National assessment of student achievement (NASA) 2017*. Authors.

Eisner, E. W. (2002). *The arts and the creation of mind*. Yale University Press.

Ellis, C. (2004). *The ethnographic I: A methodological novel about autoethnography.* AltaMira Press.

Ellis, C. S., & Bochner, A. P. (2000). Autoethnography, personal narrative, and personal reflexivity. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed.) (pp. 733–768). Sage.

Ellis, C. S., & Bochner, A. P. (2006). Analyzing analytic autoethnography: An autopsy. *Journal of Contemporary Ethnography*, *35*(4), 429-449.

Forbes, S. (2003). *Holistic education: An analysis of its ideas and nature.* Foundation for Educational Renewal.

Freire, P. (2005). *Pedagogy of the oppressed.* Continuum.

Gibbs, P. (2015). Transdisciplinarity as epistemology, ontology or principles of practical judgment. In *Transdisciplinary professional learning and practice* (pp. 151-164). Springer International Publishing.

Goldberg, M. (2017). *Arts integration: Teaching subject matter through arts in the multicultural settings* (5th ed.). Taylor & Francis.

Greene, M. (1995). *Releasing the imagination: Essay on education, the arts, and social change.* Jossey-Bass.

Grundy, S. (1987). *Curriculum: Product or praxis?* Falmer Press.

Habermas, J. (1972). *Knowledge and human interests,* (2nd ed.). Heinemann.

Hardiman, M. M., & JohnBull, R. M. (2019). From STEM to STEAM: How can educators meet the challenge. In A. J. Stewart, M. P. Mueller, & D. J. Tippins (Eds.). *Converting STEM to STEAM Programs: Methods and examples from and for Education*. Springer.

Harris, A., & de Bruin, L. (2017). STEAM education: Fostering creativity in and beyond secondary schools. *Australian Art Education*, *38*(1), 54-75. https://doi.org/10.3316/ielapa.264990875269583

Hazelkorn, E. & Gibson, A. (2017). Public goods and public policy: What is the public good, and who and what decides. Centre for Global Higher Education, UCL Institute of Education, London.

Luitel, B. C. (2009). *Culture, Worldview and Transformative Philosophy of Mathematics Education in Nepal: A Cultural-Philosophical Inquiry* [Unpublished doctoral dissertation]. Curtin University of Technology.

Luitel, B. C. (2013). Mathematics as an im/pure knowledge system: Symbiosis, (W)Holism and synergy in mathematics education. *International journal of Science and Mathematics Education, 10*(6). https://doi.org/10.1007/s10763-012-9366-8

Luitel, B. C., & Taylor, P. C. (2005). Overcoming culturally dislocated curricula in a transitional society: An autoethnographic journey towards pragmatic wisdom. Paper presented at *the annual meeting of the American Educational Research Association (AERA)*.

Luitel, B. C., & Taylor, P. C. (2013). Fractals of 'old' and 'new' logics: A post/modern proposal for transformative mathematics pedagogy. *Philosophy of Mathematics Education Journal*, 27. http://people.exeter.ac.uk/PErnest/pome27

Luitel, B. C., & Taylor, P. C. (2019). Introduction: Research as transformative learning for sustainable futures. In *Research as transformative learning for sustainable futures* (pp. 1-16). Brill. https://doi.org/10.1163/9789004393349_001

Manandhar, N. K., Pant, B. P., & Dawadi, S. D. (2022). Conceptual and procedural knowledge of students of Nepal in algebra: A mixed method study. *Contemporary Mathematics and Science Education, 3*(1), ep22005. https://doi.org/10.30935/conmaths/11723

Mezirow, J. (1991). *Transformative dimensions of adult learning.* Jossey-Bass.

Moll, L., & González, N. (2004). Engaging life: A funds-of-knowledge approach to multicultural education. In J.A. Banks & C.A. Banks (Eds.), *Handbook of research on multicultural education* (2nd ed., pp. 699–715). Jossey-Bass.

Mueller, J. (2005). The authentic assessment toolbox: Enhancing students learning through online faculty development. *Journal of Online Learning and Teaching, 1*(1), 1-7.

Nakagawa, Y. (2018). Eastern philosophy and holistic education. In J. P. Miller, K. Nigh, M. J. Binder, B. Novak, & S. Crowell (Eds.), *International handbook of holistic education* (pp. 42-50)*.* Routledge. https://doi.org/10.4324/9781315112398

Pant, B. P. (2015). P*ondering on my beliefs and practices on mathematics, pedagogy, curriculum and assessment* [Unpublished MPhil's dissertation]. Kathmandu University.

Pant, B. P. (2017). Doing, teaching, learning and thinking about mathematics: On becoming a transformative teacher. *Journal of Education and Research*, 7(1), 11-24.

Pant, B. P., Luitel, B. C., & Shrestha, I. M. (2020, January 3-6*). Incorporating STEAM Pedagogy in Teaching Mathematics.* Proceedings of the *Eight International Conference to Review Research in Science, Technology and Mathematics Education (episteme 8),* Homi Bhabha Centre for Science Education, Mumbai, India. https://episteme8.hbcse.tifr.res.in/proceedings/

Rittle-Johnson, B. (2019). Iterative development of conceptual and procedural knowledge in mathematics learning and instruction. In J. Dunlosky & K. Rawson (Eds.), *The Cambridge Handbook of Cognition and Education* (pp. 124-147). Cambridge University Press. https://doi.org/10.1017/9781108235631.007

Rudge, L. T. (2008). *Holistic education: An analysis of its pedagogical application.* [Unpublished doctoral dissertation]. Ohio State University.

Save the Children. (2016). *Protecting children in brick kilns: Stories of children and their families*. Save the Chilren.

Schubert, W. H. (1986). *Curriculum: Perspective, paradigm, and possibility*. Pearson College Division.

Shrestha, I. M. (2018). *My pedagogical sensitisation towards holistic mathematics education: A practitioner's inquiry* [Unpublished MPhil's dissertation]. Kathmandu University.

Spry, T. (2001). Performing autoethnography: An embodied methodological praxis. *Qualitative inquiry*, *7*(6), 706-732.

Stock, P., & Burton, R. J. (2011). Defining terms for integrated (multi-inter-trans-disciplinary) sustainability research. *Sustainability, 3*(8), 1090-1113.

Stroud, A., & Baines, L. (2019). Inquiry, investigative processes, art, and writing in STEAM. In M. S. Khine & S. Areepattamannil (Eds.), *STEAM education: Theory and practice* (pp. 1-18). Springer.

Taylor, P. C. (2016). Why is a STEAM curriculum perspective crucial to the 21st century? https://researchrepository.murdoch.edu.au/id/eprint/37950/1/STEAM.pdf

Taylor, P. C., & Taylor, E. (2019, June). Transformative STEAM education for sustainable development. In *Empowering Science and Mathematics for Global Competitiveness: Proceedings of the Science and Mathematics International Conference (SMIC 2018), November 2-4, 2018, Jakarta, Indonesia* (Vol. 125). CRC Press.

Taylor, P. C., Taylor, E. L., & Luitel, B. C. (2012). Multi-paradigmatic transformative research as/for teacher education: An integral perspective. In *Second International Handbook of Science Education* (pp. 373-387). Springer.

Taylor, P.C. (2013). Research as transformative learning for meaning-centred professional development. In O. Kovbasyuk & P. Blessinger (Eds.), *Meaning-centred education: International perspectives and explorations in higher education* (pp. 168-185). Routledge.

Wickson, F., Carew, A. L., & Russell, A. W. (2006). Transdisciplinary research: Characteristics, quandaries and quality. *Futures, 38*(9), 1046-1059.