

FROM GAZING TO UNDERSTANDING

EXPERIENCING A METHODOLOGICAL SHIFT

DE LA MIRADA A LA COMPRESIÓN

Experimentando un cambio metodológico

DO OLHAR AO ENTENDIMENTO

Experimentando uma mudança metodológica

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RESUMO

Como pesquisador de educação matemática da Índia, tento capturar vislumbres de um território confuso chamado educação— ou talvez notas de campo de diferentes experiências, convidando humildemente à comunidade MES a se envolver e juntos nos tornarmos mais reflexivos em relação às nossas práticas e o que trazemos conosco. Este artigo faria perguntas relativas à educação matemática. No entanto, não começaria por perguntá-las ou marcá-las como questões de pesquisa. Neste artigo, prefiro tentar traçar as marcas de criação de certas questões de pesquisa; mostrar como esse movimento nos leva a certas questões metodológicas existenciais ao conduzir e relatar pesquisas em educação matemática.

Palavras-chave: pesquisa em educação matemática. metodologia. publicidade. adivasis da Índia. terra e relacionalidades.

ABSTRACT

As a mathematics education researcher from India, I try to capture glimpses of a messy terrain named education— or maybe field-notes from experiential tours, humbly inviting the MES community to engage and together become more reflexive towards our collective practices and baggage. This paper would, nonetheless, ask questions pertaining to mathematics education. However, it would not start with asking them, marking them as research questions. In this paper, I would rather try to trace the birthmarks of certain research questions; to show how this endeavour brings us to certain existential methodological issues in conducting and reporting mathematics education research.

Keywords: mathematics education research. methodology. publicness. adivasis from India. land and relationalities.

Como investigador de educación matemática de la India, trato de capturar destellos de un terreno desordenado llamado educación, o tal vez notas de campo de recorridos experienciales, invitando humildemente a la comunidad MES a participar y juntos volvernos más reflexivos hacia nuestras prácticas y experiencias colectivas. No obstante, este artículo planteará cuestiones relacionadas con la educación matemática. Sin embargo, no comenzaría por formularlas, marcándolas como preguntas de investigación. En este artículo, preferiría rastrear las marcas de nacimiento de ciertas preguntas de investigación; para mostrar cómo este esfuerzo nos lleva a ciertas cuestiones metodológicas existenciales en la realización y presentación de informes de investigación en educación matemática.

Palabras clave: investigación en educación matemática. metodología. publicidad. adivasis de la india. tierra y relacionalidades.

Introduction

If writing is an act of ‘meaningful’ communication— systematically communicating thoughts, hunches, tensions, anxieties, and findings— then the ‘formal’ core concern immediately shifts from drafting a research paper merely abiding certain academic rules/norms to finding whatever be the ‘best way’ to communicate. However, the normative forms of writing and presenting, maintaining the “benchmark of academic rigor and trustworthiness” (Bhattacharya, 2007, p. 1109) often stand in between what we desire and aspire to communicate and what actually gets communicated. What happens when the means of communication through a piece of write-up sheds its pretentious cloak of academic posterity¹ and needfully ventures into painful terrains of building relationships, transforming oneself and others, challenging social structures, caring, loving, facing brutalities and experiences of mundane lives— the essential core of education? Let us walk together and try to investigate a “method of currere” (Pinar, 2004, pp. 35-40)².

Methods Is ‘Being’ *The ‘Social’ I belong to*

When I write, my social- and political-geography speak the most— a riverine basin rife with land-based economic (Mukerjee, 1938), political, ecological, and bureaucratic tensions (Bhattacharyya, 2021) for centuries. In today’s academia, mine would be considered a voice from the ‘global south’— a geo-political coinage that encapsulates the historicities of the global event of colonial land-grabbing³, as well as colonizing the ‘mind’-fields⁴. I belong to a caste-society, where graded hierarchical social structures

¹ Strict practices of producing and reproducing monolithic-monolingual ways of research paper drafting, by following the oft-repeated structure of ‘motivation’ → ‘finding/formulating research question’ → ‘theoretical framework’ → ‘methodology/methods’ → ‘data’ → ‘analysis’ → ‘implication/conclusion’.

² It is a “systematic study of self-reflexivity within the processes of education”, which “provides a strategy (...) to study the relations between academic knowledge and life history in the interest of self-understanding and social reconstruction” (Pinar, 2004, p. 35). It could also become, as envisaged by Baszile (2015), a form of inquiry and modes of expression.

³ Together with a restructuring of the existing land-revenue models and building a new morality to establish the justness of these loots and changes (Said, 2003).

⁴ A widely discussed sub-theme within the anti-colonial and post-colonial scholarship, quite a comprehensive picture of this primarily two-folded process as a means of perpetuating imperial domination is presented by Ngũgĩ wa Thiong’o (1994). Firstly, the colonizers shake hands with the “flag-waving native ruling classes” (wa Thiong’o, 1994, p. 2). Then follows the annihilation of the colonized, subjugated, and marginalized populace’s belief “in their names, in their languages, in their environment, in their heritage of struggle, in their unity, in their capacities and ultimately in themselves”, leading to the creation of the myth for the colonized that their history is a “wasteland of non-achievement” and they gradually enter in a vicious cycle of “despair, despondency and a collective death-wish”. Then the imperialism which has, in the first place, created this whole deserted condition for the generations, offers itself as the cure and “demands that the dependent sing hymns of praise with the constant refrain: ‘Theft is holy’”. This is how colonization of mind legitimizes the theft, the loot of material and the cultural resources. As a by-product, it gives rise to a “new creed of the neo-colonial bourgeoisie” (p. 3) who carry forward this ideological legitimation for the generations to come. Although based on the typical historical context of Africa, as wa Thiong’o puts it forward, the resistance against the colonizing forces is by nature beyond the particular nationalities. For, the colonizing tendency is

based on endogamic sexual and nuptial norms dictated social, political, and legal behaviours for millennia (Mitra, 2021). These norms have deep and entangled connections with land-ownerships and their hereditary transfers (Kumar, 2020), defining and socially reproducing dignity—who are dignified, who are not, and what are the consequences of getting debarred from having dignity. Untouchability, among the most heinous kinds of discriminatory practices (and experiences) still thriving in human societies (Guru, 2009; Sarukkai, 2009), has been at the core of maintaining this complex structure in myriad ways. Dalits, Bahujans, and Adivasis⁵, currently population-wise constituting almost three-fourth of India⁶.

have been outcasted economically, socially, educationally, and epistemologically based on such caste-norms. Encounters with apparently ‘modern’ and liberal cultures, political independence from oppressing colonial rule, and a few significant liberatory social and legal changes that took place in post-colonial Indian polity— could not eradicate such social hierarchies based on notions of (im)purity, untouchability and social reproduction of conditions of such oppressive realities.

Entanglement of my social and ‘Geo-’

I belong to the land of rivers, West Bengal—the eastern part of the Indian peninsula. The signifier ‘West’ here refers to another geopolitical trauma that my land had to endure—the partition, breaking off of nations along different fault lines, including several cultural, representational, economic, linguistic, religious as well as land-related factors (Roy, 2009). I belong to a caste named Mahishya, which has historically been among the land-owning, but predominantly peasant lower castes residing on the floodplains of the Gangetic basin. Calcutta (now Kolkata), the capital of this land, because of its maritime trade-strategic importance, gradually became the political, administrative, and cultural center for the British colonizers, starting from the last half of the 18th century. This shaped our society fundamentally by making Kolkata the hub of the emerging elites. This also set the normative standards of Bengali society through a number of educational and socio-political reforms (Kopf, 1969)⁷. Money flowed in from local decentralized economies to the metropolitan Kolkata in forms of labor and material resources like agricultural, artisanal, and intellectual produce, only to flow out again to the European colonizers’ treasuries (Bagchi, 2010; Cuenca-Esteban, 2007) through the established European East India companies and their paraphernalia consisting of the elite clerical class. This gradual historical process was quite dominant and yet to die out. Our Mahishya villages, albeit self-dependent to quite some extent in terms of agricultural sustainability (owing to the fertile delta-lands and water-resources), still depend upon Kolkata for a dignified life. Being lower castes, bereft of social honor and dignity, people from my community for at least a century now, resorted to Kolkata-centric educational upliftments (Das, 1909)⁸. This aspiration for upward mobility had and still has its material roots in the caste-system, albeit lately the new factors, like the neo-liberal economic reforms and unemployment getting added into. Essential manual works and workers like the peasants or the artisans were regarded with disdain and contempt by the privileged classes. This has been one of the direct manifestations of the institution of untouchability. Based on these prejudices, the mobilities from one profession to another were forcefully stalled (blasphemous for a peasant, an artisan, or a sanitation worker to aspire for a

as much global in nature as is its material implications through the US-backed imperialist tradition. This is why I found the accounts of wa Thiong’o most persuasive in making sense of colonization of minds in India as well.

⁵ The term ‘Dalit’ was first formally used and defined by anti-caste activist, thinker, and social-reformer Dr B R Ambedkar in 1928 to politically signify the communities which were stigmatized based on Hindu-Brahminical scripture-dictated and socially propagated norms of untouchability and were socially, economically, culturally, and politically subjugated (Paik, 2011). Also refer to Sengupta et al. (2022). ‘Bahujans’ and ‘Adivasis’ respectively refer to other backward castes and the indigenous communities in the Indian peninsula in general.

⁶ The census-2011 data from India shows the population of the reserved categories (SC, ST, and OBC) to be three-fourth of the total population. In reality though a lot more people experience casteism in their everyday lives.

⁷ Also see Bhattacharya (2005) for a comprehensive view of the role education played in shaping the nineteenth century society of Bengal and what role the elites played in that context. See also Acharya (1995), on how the ‘Bhadraloks’ (native Bengali elites) influenced British educational policies in Bengal.

⁸ See a recent study by Roy (2012) for a similar caste-tendency from my neighboring area Singur.

clerical job) and thus exploitation of labor sustained and social hierarchies reproduced⁹. Therefore, to Mahishyas, letting go off their ancestral land in return for city-ward mobility— was a crucial deal for having a life, which is essentially a life with dignity. My personal educational journey, my ending up in Kolkata-based university and colleges, being part of city-centric political and liberatory activism— in all these, the ties to the aforementioned peculiar historical-material roots could not be denied.

I am well aware of generalizing teleologies dictating our historical thoughts. I do not want to fall prey to that. However, when I start to chart out my present and future educational research endeavors, I would want to keep those factors in mind since whatever we do, planfully (research) or unconsciously (ideological actions), we carry these undeniable historical lineages. To put it simply, I carry my ‘land’ and relationalities with me.

Being Equipped With A ‘Critical Gaze’ For publicness

I collaboratively work towards making, being in, and experiencing public spaces, be it educational, social, or political. The notion of publicness for me is not a fixed and defined categorical concept. It is informed by my understanding of the interactions, friendships, and camaraderies I have had during the last decade. It is also informed by my deeply held historical community-aspirations (described in the previous section). Search for dignity, experiencing togetherness, breaking-off heinous social barriers— my notion of publicness is ‘oriented’ (Ahmed, 2006) towards these. However, togetherness comes at a cost when the society itself is fragmented. Rooting for publicness does not remain a passive aspiration, rather becomes equivalent to being resilient and persistent in resisting dominations and hierarchies. I find historical support in my community people resisting and ensuring dignified representation¹⁰.

Although, it took a long struggling journey for me to start experiencing publicness in this manner, and I am still in that process. I characterize this as an ongoing and life-changing process of systematic creation, exploration, and experiencing of publicness. What were the effects of being part of this process?

Sharpened gaze, critical anxieties

Coming from a caste-village and entering the urban metropolitan of Kolkata as a university student opened up newer avenues of thoughts and actions for me in 2014. Direct engagement with the campus students’ politics and activism became a part of the new life (Chaudhuri, 2019)¹¹. It was during those days that the world started unfolding before me with its intricate complexities¹². It was the time when a right-wing fascist government came to national power. Funds were being cut from the higher education and research project (Bhattacharya, 2019), university autonomy was getting crunched, freedom of speech crushed. A Dalit research scholar Rohit Vemula from the University of Hyderabad was

⁹ Drawing from previous scholarly works on the origin of caste system and the institution of untouchability, Jaiswal (1978, p. 226) ascribes the cause for forming such an unique institution to a “contempt of the privileged classes for manual work combining with primitive ideas of taboo and impurity associated with certain material objects”.

¹⁰ Mahishyas, the community I belong to, a land-owning lower caste peasant community in the Gangetic delta, showed retaliatory and assertive political aspirations for a Bengali cultural and geo-political identity during the first quarter of the 20th century. See Bandyopadhyay (2018) for a history of Mahishya retaliation on the ground of “a controversial proposal to add some parts of eastern Midnapore district with the forthcoming province of Odisha” during the year of 1932, which would have certainly forced the Mahishyas of the then Midnapur district to lose their collective cultural selfhood by getting identified with the culturally different province of Odisha. For another account of Mahishya political assertion, see Das Gupta (1980), where he presents the evidence of a caste movement among the Mahishya peasants as well as Mahishya landlords aspiring for a commendable social status. It was evident that “their social position in Hindu society was not commensurate with their economic position” (p. 59) owing to the fact that a “low social status” was “accorded to them by the caste rules of Hindu society” (p. 61) despite they being the principal landowning community back then in that area. This caste movement culminated in giving the Mahishya community of Midnapur a very particular caste-based community sense, which Das Gupta terms as their own version of ‘peasant-pride’, and which in turn culminated in their formidable collective and movemental opposition against the British colonial rule both during the non-cooperation and civil disobedience movements respectively in the ’30s and the ’40s. Not only this, the Mahishya communities elsewhere in Bengal looked up to them as well.

¹¹ I was an active protester in this movement, taking place in our campus in 2014-2015.

¹² Ahmed (2006, p. 8), drawing from Husserl, would like to describe this as “the zero point of orientation, the point from which the world unfolds”.

institutionally murdered. He was being so heckled for expressing liberatory views on the questions of caste, nationality and the ongoing state brutality at Kashmir, that ultimately he had to commit suicide. He left a small letter for us, that he himself termed “first time of a final letter”. We found a radically different voice of dissent in that letter, never heard before— “The value of a man was reduced to his immediate identity and nearest possibility. To a vote. To a number. To a thing.” (The Wire Staff, 2019).

These lines resonated with my personal ongrowing uneasiness with the discipline of mathematics (I was pursuing a masters in Mathematics during that time). Did mathematics make us inhuman? Obsession with numbers, who are privileged enough to detach from reality by going meaninglessly abstract, the highly celebrated social position of mathematics as a normative type of knowledge (D’Ambrosio, 1985)— I started critically gazing at these questions and issues. In other informal educational initiatives, born out of our campus activism, we collectively tried to attend to these concerns while teaching the kids. Our initiative cum printed magazine “Science For All” featured Bengali articles critically commenting on intersection of gender, science as a discipline, values, and dying ecologies¹³. While engaging with another informal educational space in an Adivasi village in West Bengal, it was still this gaze with a condescending attitude that was at the forefront (a [term paper](#) by the author captured this attitude). Publicness was thought to be attained (engineered) through making the teachers aware of larger politics and deeply held ideologies.

Critical gaze at disciplines continued in an ethnographic work undertaken with a team of masons in 2017. The focus was to document how the professional workers think about and deal with mathematical knowledge in their workspace. The naive hope was to incorporate their views and ways of doing mathematics into the mainstream curriculum to make the school mathematics more inclusive. The conference paper born out of this work (Santra & Mukhopadhyay, 2019) fumbles badly while trying to comment upon this incorporation. The masons valued school mathematics, but did not bother about the possible connections it might have had with their own professional work.

Boundary Plays and Figured Worlds: Some Contingent Theoretical Support

I was swinging and struggling between “mathematics made us inhuman” and “we made mathematics inhuman” until a public lecture series by Prof. Pratim Sengupta gave us the opportunity to listen to his work with Prof. Marie-Claire Shanahan, on publicness and public computing. They clearly demarcated:

In using the word public we are careful to engage the term primarily as a description of experience in a space and its materiality rather than only as a noun for those involved. (Sengupta & Shanahan, 2017a).

The notion of ‘figured worlds’ (Sengupta & Shanahan, 2017b) casted a new light, for me, on publicness in the context of mathematics education. Making a learning space accessible to the public is not the end, rather a mere starting point. Learning affordances could further be designed and used purposefully to mediate the epistemological pathways of disciplinary knowledge. But the term ‘design’ has every possibility to evoke the sense as if learning were a literal ‘engineering problem’. With a careful reflection now, I confess that I was still poised with such a view back then. ‘Gazing’ (be it critical or condescending) itself has its closeness to positivist attitudes (Kincheloe & Tobin, 2009). Thanks to the theoretical support provided by Sengupta & Shanahan (2017a, 2017b), I was at last coming to gradually realize that it would probably take a lifetime of everyday internal and external intellectual struggle to do away with such attitudes. Theoretical framework could not ensure stability to me, it charted out further uncertain terrains.

¹³ Santra (2017) is one such article written in Bengali.

Terrains Of Experience

I was gradually coming to terms with ‘experience’. From my fieldwork done during the pandemic to my MPhil proposal— I kept struggling to make sense of publicness from a phenomenological ground¹⁴. Although, throughout I have been very close to experiences— personal, political, and social. What I needed was a fundamental shift from ‘gazing’ to ‘understanding’. I have incrementally started learning from indigenous feminist scholars and activists what understanding means. For them, it is a dire need to soften the “boundary erected long ago between those who know versus those from whom the raw materials of knowledge production are extracted” (TallBear, 2014, p. 2). Otherwise, researchers as morally just and honest agents, could (and oftentimes, do) become the subject of the “outsider/insider disease of angst” (TallBear, 2014, p. 4)— flipside of which is a condescending attitude towards the oppressed and marginalized peoples they work with. I have started learning from them what relationality is and why research work must be practiced and performed as building, maintaining, and evolving relationships with “place, one another, more-than-human kin, the environment, to natural cycles and expected returns” (Tuck et al., 2022, p. 3). These helped me to “slow down” (Tuck et al., 2022, p. 3), to listen to my own feelings, aspirations, stories and histories, and gave me a window to reflect upon what I have been doing and thinking. Understanding has to be standing with humbleness, care, “labor of love” (Tuck et al., 2022, p. 3 & p. 6); it is in acknowledging the idiosyncrasies, complexities and pain we bear and experience. True that different figured worlds could be made to come and interact with each other at their boundaries, there could be ‘boundary plays’ (Sengupta & Shanahan, 2017b), but not without the unexpectedness it could lead us into.

In the next section, I would like to describe in short, two distinct experiences from the field I work(ed) with. Terrains— where things took ‘unexpected’ turns. Methodologically shifting from gazing to humble understanding has not only been helping me navigate through those turns, rather I would argue, the turns were visible in the first place due to this very shift itself!

Turn! Turn! Turn!¹⁵

Mutual aid

In one of our collaborative science literacy projects with the teachers and students from the organization Paschim Banga Kheriya Shabar Kalyan Samiti¹⁶, we played a game where the participants were acting as butterflies foraging for nectar from flowers¹⁷. This followed another outdoor session on finding wild butterflies and documenting their behavior. The participants were supposed to play the game and simultaneously keep track of the loss and gain of energy with a basic mathematical calculation at each round (using a hand-out provided to them beforehand). The intention was to look at the emergent behavior of the whole flock, and at the same time, mathematizing the collective and individual behaviors to an extent possible, to make a sense of complexity as an emergent phenomenon. Once the ‘energy’ depletes completely from a butterfly, it dies. The participant acting as that butterfly then has to step down from the game. However, when such a situation actually came after introducing a preying bird (one of us), the butterflies (the kids) invented their own moves by giving each other mutual support in forms of energy units (marble pebbles). They did not want their friends to depart. The game did not work out as ‘planned’. But we realized, the Kheriya Shabar kids were deeply caring for each other. In their figured

¹⁴ In that fieldwork report, I went on to ‘analyze the data’ and describe a teleology of ‘why’ things were happening. It was based on documenting people’s disciplinary experiences of mathematics assessments, which were painful, humiliating, and self-excruciating. Later in my MPhil study, people’s experience gradually came to the centre. Contact me to read these unpublished reports.

¹⁵ https://en.wikipedia.org/wiki/Turn!_Turn!_Turn!

¹⁶ This is a community NGO in Rajnagarh, Purulia district, West Bengal, India. Kheriya Shabars are one of the ‘denotified’ indigenous communities from India (DNT, denotified tribes). They were declared by the British colonial rulers as criminal tribes (Criminal Tribes Act 1871) and faced rampant police brutalities for more than a century. Though this particular act has been repealed by the Government of India in 1949, an almost similar one, Habitual Offenders Act 1952, was enacted in place of that. Since the colonial taking-over of the forests and forest-land in the name of ‘protecting’ them through Forest Departments and legal structures, the Kheriya Shabars, predominantly forest dwellers, started losing their livelihoods and now economically they are one of the most vulnerable communities. The Samiti works towards economic, cultural, and educational upliftments of the Kheriya Shabars. I and my fieldwork mentor Dr Tathagata Sengupta visited the place and conducted week-long learning sessions in collaboration with the students and teachers from the Samiti.

¹⁷ Adapted from the embodied modeling activity described in Dickes et al. (2016, pp. 743-749).

world, elimination was a painful experience to avoid, if avoidable. Their world met with ours, and showed us a new possibility. We stumbled upon the questions, “Have we been trying to model the world wrongly?, “Did we consider mutual aid when we designed the game?”

Boundary plays are not fancy: conflicts and resistances

I invite you now to a recent ongoing fieldwork. This is another Adivasi village in the same district, where I first reached as an environmental activist when the villagers were protesting against a multinational hydel-power company sponsored pump storage-based power project to be built. This was illegally sanctioned by the state government to be built over a natural falls and a vast hilly forest land around it (Mukherjee & Prokritibadi, 2019). These falls and the forests are the lifeline of the Adivasis, part of their livelihood, culture, spiritual beliefs, and collective existence. Their protest garnered active solidarity from several other indigenous villages in that area and now is one of the leading indigenous, anti-corporate, anti-state movements in the state. I later was invited to teach in one of the make-shift informal learning spaces the protesting youths have built for the village kids during the pandemic. It was when the formal government schools were shut down. My proposal for experiencing a public mathematics learning space is based on this learning space. I, together with the kids and my principal research partner and friend UM (abbreviated original name, to protect his identity), who is an adivasi protester from the village itself, are working on building a mathematics curriculum which would help us all scientifically understand the inappropriateness of such a hydel project in their area. I had my own notion of scientifically understanding the ecological effect of such a big project. During our background reading, we chanced upon a document, the environmental clearance¹⁸ of another similar project in the same area, the Bandu Pumped Storage Project. The same hilly area already had the PPSP (Purulia Pumped Storage Project), a completed project right now, running from 2008. It was also found that not only the controversial illegally sanctioned recent one, it was actually a string of 4 such projects including the PPSP, which were proposed by the Government Of India’s Central Electricity Authority in the year 1979 (Bhaduri & Gangulee, 2014). Nobody from the area knew about any of these until the government notice for the recent one came out. The PPSP was also completed without conducting any public hearing back in the 2000s. A careful reading of the environment clearance document divulges the gaze of the engineers and the surveyors on the area, its people, environment, and ecology. Based on some calculations (probably on the water flow, heights of the dam, the average rainfall etc.), they found all the 4 schemes to be “techno-commercially feasible” (p. 8 of the said pdf document given in footnote 18).

I learned from the protesting indigenous activists, the villagers, and my friend UM what feasibility means in their everyday lives. They do not have enough hospitals, anganwadis¹⁹, higher education institutions, even proper access to drinking water. They do need electricity, but not at the cost of devastation of their forests, land, water, and their deity Marang Buru²⁰. Moreover, they did not have a say in deciding what is feasible for them in the first place! Feasibility was being defined and redefined by powerful people, using powerful media, guided by the logic of profit and ‘usability’²¹. I and UM kept reading the document and found out that it did have a chapter on environmental impact (pp. 78-139 in the said pdf given in footnote 18). Surprisingly, it talked about environment and ecology in terms of cost and compensation. UM smirked, “What does 11000 Lacs even mean?”

His smiling face immediately made me stumble at a boundary of two conflicting figured worlds (Sengupta & Shanahan, 2017a). It was a boundary play (Sengupta & Shanahan, 2017b), of a learning that initiated for me at that very moment and was going to be what Tuck described as, a constant tugging

¹⁸ Find it here.

¹⁹ Government funded rural child care centers

²⁰ Marang Buru (Buru = hill, in Santali language) is more than a hill. It is one of the most sacred places for the Santals to congregate during the auspicious days of performing their rituals. It figures abundantly and respectfully in Adivasi folk tales and everyday stories. The recent project will completely submerge Marang Buru. The project engineers are going to use two adjacent hills as the two walls of the storage tank itself. One of the hills among them is Marang Buru.

²¹ K-12 science textbooks too harp on the feasibility aspects of hydel power, ignoring the complex social, ecological, economical, cultural, and spiritual consequences of such projects. Reinforcing one straitjacketed view by ignoring other and multiple views and voices rooted in multiple conflicting experiences, is a form of symbolic violence (Sengupta et al., 2022) worth resisting.

to my elbow for the rest of my life (Tuck et al., 2022, p. 10). “How dare one make a valuation of the environment, ecology, and lives—animate and inanimate, in monetary terms?”

Boundary play here was a conflict between how our modernized, scientized, statist, corporatized, capitalist world ‘calculates’, and how indigenous communities ‘sense’, ‘experience’, and ‘live’. I felt that learnings from Sengupta & Shanahan (2017a, 2017b) might give me a conceptual framing to do away with the uneasiness sparked by UM and other elderly activists’ nonchalant smiles targeted at what they found as completely absurd. But it took me to newer discomfiting avenues. How far could we allow the boundary play of an ‘other’ epistemological world with a demarcated world of disciplinary mathematics? Is it possible to play at all if the values embedded in both the worlds are completely in conflict with each other? Not only conflict, as I could understand from the ongoing movement, indigenous values are sometimes showing constant resistance against the values imbued in disciplinary bodies of knowledge like mathematics, science, and engineering. UM, for example, while showing me his ancestral paddy fields, pointed out the coexistence of hilly terrains, water channels, small river beds and sowed lands. In most of the cases, there is no demarcating mark between fields. The idea of ownership was different and beyond the individualistic profit-oriented goals. The small trek around UM’s village that day made me reflect upon my own understanding of my community’s ‘peasant-pride’ (see footnote 10), whether ownership in our community’s case too had more layers under its sleeves, whether it was only about profit-making (and boasting landlordship).

Riverbed itself is a moving entity in UM’s village, and people with their harvests move along with it. There are small embankments made with hilly rocks to divert the flow of water in such a way that all the fields get adequate water, at times when needed. The embankment is moving too, depending upon people’s negotiation. With consents from others, one can simply shift the rocks around to direct the flow in their required direction. Pointing at one such small embankment, UM utters, the engineers should learn from us how to ‘play’ and live with water; they know only how to kill it efficiently.

UM and elderly community members from the protesting villages are demanding their stolen lands, water, lives, and asking for their epistemological spaces to be represented. One could listen to NB, an elderly Adivasi activist and organizer of the protest, demanding an university in Purulia where the best studies could be offered on ecology, environment, and adivasi people’s lives and culture. He invites us, the ‘good’ folks from Kolkata, to get admission to that university and learn about nature and its people. What would then a public mathematics curriculum look like, if it acknowledges relationality, conflict, resistance, land- and water-questions, ecology, pain, loss, joy, humiliation, care, and love? What public²² would it then create around itself? These are the unexpected questions I stumbled upon while being taken away, by my friends, comrades, and research participants, towards unexpected turns.

What Awaits?

Not maintaining the ‘usual’ structure of a research article is neither ‘woke’ nor does it pertain to advocating for some ‘post-structure’ in paper writing. We wanted to be true to our experiences and wished for a meaningful means of communicating the concerns, tensions, and anxieties felt in the field of mathematics education in India. As a long-felt concern in qualitative inquiry, we argue after Bhattacharya (2007) that, what we could or could not do in terms of research actions and analysis, are dependent upon the methodological paradigm we operate within:

The failure to know and extract certain information can be an indication of the limits of a framework, methodology, or epistemology. (Bhattacharya, 2007, p. 1103).

Some might become very anxious about this ‘failure’ aspect; they might wonder, if there is no such objective magic-wand that could seamlessly produce or extract data from our participants, what is it that educational research does anyway? We do not think this to be an illuminating question at all. We only

²² My MPhil proposal document delineates what I mean as ‘publics of mathematics’ and their possible reimagination, drawing from the historical work done by Senthil Babu (2015) on epistemology of mathematics.

know that forging new friendships and relationalities in this immensely broken world and writing real stories about them could be the only way ahead. It could be the only ‘method’ that awaits us— the MES researchers, probably in search of a ‘resilient ecology’ (Gutiérrez, 2016) to grow more.

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