

Only Connect: Indigenous Digital Learning.

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Abstract. There is now a unique interdisciplinary opportunity to work across the various digital technology development communities, for example ICT4D and m4d, albeit with their conservative conceptions of learning, and the innovative digital learning communities breaking away from institutional e-learning formats, for example the open learning movement, at a time when many indigenous communities in the global South have considerable experience, access, ownership and familiarity with personal and social digital systems and when the decolonising movement provide the impetus and processes to develop new tools and techniques to work together for an accurate and authentic understanding of learning needs and the methods to address them. This is timely and urgent since digital technologies, produced by Anglophone global corporations and promoting the global knowledge economy, threaten fragile cultures and languages and promote the Fourth Industrial Revolution whilst in fact delivering the next wave of epistemicides. This paper sets out the case for urgent, collective and coherent action.

Keywords: digital learning, participative development, ICT4D2.0, community MOOC

1 Introduction

The global context and the specific contexts of different indigenous peoples are changing rapidly, and these changes are accelerating. They include the environmental and ecological contexts, as for example climate change imperils many but especially fragile, nomadic, coastal, rural and remote communities; economic contexts as economic power and output shifts away from traditional centres and resources, and towards China, Russia and the Gulf amongst others, and towards knowledge and information not raw materials as commodities; political contexts with the rise of populism, extremism and nationalism and the failing legitimacy of democratic institutions and intellectual expertise; cultural contexts as global English and American culture overwhelm smaller languages and cultures; and technological contexts as digital technology and all it embodies and empowers becomes more intrusive, pervasive and ubiquitous.

We argue in this paper that digital learning within indigenous communities is one of the measures that might ensure and enhance the safety and identity of these communities and argue that there is now a unique and urgent interdisciplinary opportunity to

- work across the various digital technology development communities, for example those represented by ICT4D¹, m4d² and IST-Africa with their relatively conservative conceptions of learning, and
- the innovative digital learning communities as they break away from high-tech institutional e-learning formats, for example the open learning movement as exemplified by OER19³ in April 2019, at a time
- when many individuals and communities in the global South now have considerable experience, access, ownership and familiarity with personal and social digital systems and technologies and when
- the decolonising movement, as exemplified by a course at Goldsmiths⁴, and our seminar at the University of Manchester provide the impetus and processes to develop new tools and techniques to work together for an accurate and authentic understanding of learning needs and the methods to address them, and where there is an alignment with the growing scepticism and critique of inclusion and participation in the universities of the North [1]
- and confront the challenge and rhetoric around what is promoted as the Fourth Industrial Revolution, uncritically embracing the rise of pervasive AI (artificial intelligence), IoT (the Internet of Things) and performance support technologies including wearables and real-time translation (Smith & Anderson 2014), specifically in how they might constrain and direct the nature and opportunities for the learning and livelihoods of marginal, indigenous and nomadic languages, communities and traditions.

This is also a timely analysis since this year, 2019, is UNESCO *International Year of Indigenous Languages*.

2 Context and Reasoning

The economic development, social cohesion and welfare of individuals and communities depends on, we argue, understanding their aspirations, their needs and their environment, and the role that learning, however that is conceived for them, can play in their lives. This can however only happen based on research methods that encourage authentic expressions of these needs and aspirations, and on learning characterised by participation, choice and control. This is especially true of diverse indigenous communities distant and different from global norms and practices. Otherwise, even in purely methodological terms, there are the risks *inter alia* of that much may be *taken-for-granted* and *not-worth-mentioning* [2][3]

Mobile phones and social networks are transforming the definition, nature and ownership of learning. They provide people and communities, including many indigenous ones, rather than just corporations and institutions, with the spaces to create, transform, share, store, discuss and discard their own opinions, ideas, information and images, using popular free web2.0 systems accessed by mobile phones, and defining learning in ways outside the mainstream or established curricular and pedagogies. For most of the world's population, even those in many

¹ <https://www.ict4dconference.org>

² <https://www.kau.se/en/news/m4d-2018-conference-kampala-uganda-november-15-16-2018>

³ <https://oer18.oerconf.org/launching-oer19-recentering-open/>

⁴ <https://www.gold.ac.uk/asc/workshops/decolonizing-research-methods/>

⁵ <https://bceltra.wordpress.com/2018/12/06/a-meeting-with-john-Author/> (now removed)

⁶ <https://en.iyil2019.org>

remote regions, mobile technologies are the portals to social media, web2.0, Internet resources, online communities and learning opportunities. Whilst this has been argued in general and global terms [4], this is not to argue for alternative generalisation about indigenous communities but rather to focus the necessary discussion.

These new spaces for learning create opportunities to develop and combine new and appropriate pedagogic and technological tools and techniques, that we outline later, and new and appropriate research tools and ethics, also outlined later, to empower and engage excluded indigenous groups and communities, and their vulnerable languages and cultures. Such opportunities must however be exploited within a more critical stance about tensions between the global knowledge economy and its domination by a limited range of languages, values and economic modes, and local communities with more fragile indigenous livelihoods, languages, cultures and traditions.

These opportunities possibilities and challenges are already apparent and are set to continue, thereby creating and complicating digital divides but also affording the chance to expose, address and reduce them. We are keenly aware that no research, education and technology is culturally, economically, ecologically or politically neutral and often favour larger or more powerful classes, castes, countries, corporations and cultures so our brief is to promote continued rigour and scrutiny in the interests of the smaller and less powerful. The roles of research, learning and technology in the context of informal digital learning must be problematised in order to improve welfare and sustainable livelihoods in indigenous communities.

At the heart of this paper is the aim to explore and support ways in which communities can express and address their own learning needs and aspirations using the digital technologies that they own, access, control and afford in order to build community spaces for learning. In doing so, they will meet their own immediate priorities and preferences and develop digital skills and attitudes that will grow and sustain these spaces. They will also be able to develop their own collective critical, meta-cognitive and conceptual skills and thus ensure and enhance their future learning and livelihoods.

This must however take place in a context of a critical and rigorous awareness that the pedagogies, languages, cultures and values of many marginal communities, away from the national, epistemological, organisational or economic mainstream, are threatened by the drive to scale and sustainability, the need to present success, the modernist mind-sets of officials and the demands of funders. Consequently, any activities with and within the communities must be coupled with a critique of the ways in which policy, funding, dissemination, history, culture and capacity select, skew, filter and bias the evidence, reasoning and understanding of the effectiveness and ethics of programmes, pilots and projects attempting to tackle disadvantage. The dominance of American digital corporations and of the global knowledge economy are also part of this critical awareness [5].

This agenda has to be seen within a wider agenda of decolonising development studies research [6] and its parallels within the disadvantaged margins of developed regions. It also resonates with continued exploration of the Capabilities Approach in relation to learning contexts, in seeking to promote the learning and livelihoods that people and communities themselves value.

3 Interdisciplinarity

Part of the case we are making for renewed interdisciplinarity is the relative ignorance of some research communities of the most imaginative and exciting research and development happening in others.

This certainly seems true when we look at how education in general and digital learning in particular are understood within those research communities looking at digital technologies in international development. An examination of the outputs and proceedings of the ICT4D and m4d⁷ conferences bear this out and in Africa those of the IST-Africa series make a similar point in an African context. This may in part be a reflection on the priorities of the agencies and funders. These seem focus on initial formal education systems⁸ and on concerns to make these systems function more effectively and efficiently; they focus on scale, sustainability and cost-effectiveness, avoiding the risk of innovating within largely conservative and under-trained post-colonial education management and ministries.

If we look at the focus and concerns of the digital learning research community, for example ALT_C, the annual conference of the UK Association for Learning Technology⁹, ISTE, the comparable body in the USA (see a recent blog¹⁰) and the STELLAR *Alpine Rendezvous* [7] community at the cutting edge of research in TEL (technology enhanced learning) across Western Europe, we can also see clear trends, topics and positions. Notwithstanding the obvious national and regional focus and responsibility, and the diversity across these examples, it would still be fair but understandable to discern a pre-occupation with Western formal education, its institutions, its professionals and its ethos, with technological sophistication and with an implicit consensus in how the Western mainstream sees learning, training, schooling and studying. Even their own minority communities and languages, for example digital learning for Native Americans, Welsh-language speakers or the Roma, seldom feature. Part of the explanation may be a residue or expression of the trickle-down mechanisms of the innovation paradigm that dominated the financing and structuring of these kinds of research and/or practitioner communities across the 1990s and beyond, and the fact that these have favoured established channels and approaches in mainstream institutions rather than unorganised groups on the margins.

There are of course research centres, communities and conferences already based around indigeneity and indigenous peoples, around their epistemologies [8]. Random examples include the *American Indigenous Research Association*¹¹ with its newly launched *Journal of the American Indigenous Research Association*¹² and *IK: Other Ways of Knowing*¹³, the *International Indigenous Research Conference*¹⁴ in New Zealand/Aotearoa, the *International Conference on Indigenous Languages*¹⁵ in Canada, the *World Indigenous Research And Education Conference*¹⁶ in Norway and the *Contemporary Indigenous Knowledge and Governance group*¹⁷ at Charles Darwin University in the Northern Territories of Australia. These are all however based in or around technologically and educationally sophisticated countries and institutions. There are also associated groups of activists and advocates, for example the *Indigenous Peoples of Africa Co-ordinating Committee*.¹⁸

⁷ <http://cit4.mak.ac.ug/M4D2018/about.html> for 2018 and all earlier proceedings

⁸ for example, the focus on children with the school system in the new DFID EdTech Research Hub, <https://www.gov.uk/government/news/uk-aid-funds-worlds-biggest-educational-technology-research-project>

⁹ https://www.alt.ac.uk/events/past_events

¹⁰ <https://blog.edgenuity.com/iste-2018-conference/>

¹¹ <http://www.americanindigenousresearchassociation.org>

¹² <https://airajournal.wordpress.com>

¹³ <https://journals.psu.edu/ik>

¹⁴ <http://www.indigenousresearch2016.ac.nz>

¹⁵ <https://www.fpcflanguageconference.com>

¹⁶ <https://wirec2018.weebly.com>

¹⁷ <https://www.cdu.edu.au/northern-institute/contemporary-indigenous-knowledge-and-governance>

¹⁸ <http://www.ipacc.org.za/en/>

There are already some examples of parts of the interdisciplinarity that we need. HCI4D[®] is at the intersection of HCI, human-computer interaction, and development studies, but lacks the innovative digital learning dimension. One typical publication from this community is *At the Intersection of Indigenous and Traditional Knowledge and Technology Design* [8].

So, the most urgent need is to create contact and communication amongst these various groups and networks and to create the interface, forum and discourses for synergy and synthesis.

4 Innovative Research Tools

Moving on from communities to actions, there is an urgent need for improved research tools [9]. Some sources already give us a generic overview for research methods [9] but most lack the digital learning dimension. Some do focus on indigenous cultures and others on the mobilities that might characterise some nomadic cultures [10]. Classical/conventional methods [11] [12], in the context of indigenous communities, are however problematic, and by the classical/conventional methods, we mean questionnaires, focus groups, semi-structured interviews and surveys, the defaults within the social sciences of the global North. They are problematic in a context of decolonising development studies research [13] [14] [15] [16] both in terms of techniques and methods and in terms of empowering local researchers. We could critique individual techniques here on specific grounds, for example infrastructure in some cases, literacy in some others, but these critiques are all the consequences of the historical hegemony of the global North in academic research.

Broadly, our argument is that without adequate research tools, it is difficult to get trustworthy access to the aspirations, experiences, expectations, environment and constraints of individuals and communities, especially of individuals and communities that are different from our own and distant from the mainstream values, culture and language of their respective countries as expressed and embodied in their institutions and systems.

However, in order to explore these aspirations, expectations and experiences and to expose the tensions and conflicts within and across communities, it is necessary to critically examine conventional research tools and seek to develop and validate more appropriate ones, especially given the radically different technical, infrastructural and financial environments, alongside the radically different cultural, economic and social environments. Likewise, the subsequent collaborative development of any digital space to enhance the opportunities, resources and activities of the community needs better and more appropriate developmental tools and formats in order to record and respond to communities as they participate in workshops, trials and evaluations. We should recognise of course that the expertise and experience to do this may already reside in other communities so we must reach out and ask questions nevertheless there is a clear need for better tools from data gathering all the way through to participative development and to sustainable community ownership.

So, this work need not start from a *tabula rasa*. There is already local and specialist work, for example, from the USA, the conceptual model of the Indigenous Research Paradigm of the AIRA[®] and *Research for Indigenous Survival: Indigenous Research Methodologies in the Behavioral Sciences* [17] addressing the problems that researchers encounter when adjusting social science research methodologies to [sic]

¹⁹ <http://chi2013.acm.org/communities/hci4d/>

²⁰ <http://www.americanindigenousresearchassociation.org/mission/spider-conceptual-framework/>

‘Native values and tribal community life’. This reinforces the point that there are threads waiting to be woven. The same is true of any work on ethics. We have already outlined some overarching issues from a digital technology, education and development studies perspective [18] whilst *Research Ethics in Africa: A Resource for Research Ethics* [19] [20] is an example of how the institutional perspective can try to comprehend some indigenous issues within its systems and procedures. We do however anticipate that much needs to be done to generate a more inclusive and sensitive account of what constitutes ‘harm’ in the cultures of indigenous communities and how issues like ‘informed consent’ play out away from the highly individualistic and legalistic concerns of Western Europe.

5 Progressive Digital Learning

Increasingly, progressive digital learning, meaning digital learning that is better aligned to the different forms of the increasing movement and connection that now characterise most countries and societies, meaning the digital learning outside institutional digital learning, is about the ownership, creation and control of learning by learners. We feel these, if approached with open minds and the capacity to adapt (and fail) represent a multitude of likely resources, and that disillusionment with the institutional e-learning 1990s [21] and the growth of web2.0 [22], personal and social digital technologies [23] have examples, ideas and concepts ripe for examination and adaptation. Some principles, ideas and concepts that exemplify this progressive digital learning include,

- critical digital literacy, building the skills, attitudes, competences and knowledge to flourish in an increasingly digital world, and to critique the underlying forces and relations, by ‘taking a position’ and asking, of digital resources and interactions, and of education and training, ‘whose interests are being served?’[24], [25], building on recent work that critiques the largely Eurocentric conceptions of digital literacy [26];
- curation, the skill of identifying, managing, evaluating and exploiting external digital content and communities [27] in order to create flexible and evolving community-based learners’ libraries matched to learners’ styles and preferences
- micro-learning [28], learning in very small ‘bites’
- personal learning environments, encouraging and enabling learners to customise or create their own digital learning community and support; supporting personalised and autonomous learning [29] [30]
- community MOOCs, the orchestration of free digital and/or open tools, systems and resources to produce learning community learning spaces; [31][32][33][34][35]
- user-generated content, learning by creating shared, digital resources; valorising the learner amongst other learners, and linked to the rhetoric and practice of the more radical voices of European adult literacy movement and the worker-writers movement [36][37]²¹
- e-portfolios, a tool helping learners reflect on their journeys and achievements
- game mechanics plus learner analytics, encouraging active digital learning through community review and recommendation [38] [39] [40] [41],

²¹ both these sources use phrases that would resonate deeply with indigenous communities

allowing learners to judge their level of expertise and achievement in emerging subjects

- mobile learning, matching learning to the dominant digital technology, quite likely the default for any indigenous community perhaps supplement by internet cafes, but updated from its original conceptions in the 2000s; [42] [43]
- flipped learning, encouraging engagement and reflection, and optimising contact and community [44] by encouraging individual or group retrieval and assimilation before larger group discussion and support
- digital badges and other forms of learning recognition and credentialing, creating a sense of achievement and progression [45]
- open learning, without any barriers of cost, access and entry but specifically open development, open source or Open Educational Resources (OER) [46] [47][48];
- connectivism, a pedagogy exploiting communities catalysed by connectivity and thus made more than the sum of their parts, [49] [50]
- heutagogy, a pedagogy articulating the attitudes, methods and tools of self-directed learning [51] [52]

These have all been implemented or developed on free and/or open software tools and systems, mostly in more developed countries, organisations and institutions. There has however been no comprehensive, coherent or consolidated attempt to test, adapt and deploy across developing or disadvantaged communities or cultures. Clearly there are technical constraints – bandwidth, power supply, connectivity, airtime – that must be considered; increasingly mobile phones are the portal to these resources in regions of poor infrastructure.

There is clearly a need to combine innovative and appropriate research tools and methods that would explore the needs and aspirations of disadvantaged and disparate communities with the development of innovative and appropriate digital learning spaces that would address these needs and aspirations, adapting and combining local pedagogies to the digital space and innovative digital learning to local cultural expectations. These would furthermore be by definition self-sustaining and adaptive, technically, culturally and financially.

6 Process

The core of the development work that is needed would be regular participative workshops events hosted within each of the participating indigenous communities, and supported by a local coordinator and local researchers. These would develop the tools, mentioned earlier, that would then underpin the adaption of the pedagogies, also mentioned earlier, for integration into the eventual community space. In these, the focus would move from initially

- the iterative introduction, evaluation, adaptation and validation of conventional²² and innovative²³ social research tools and methods, where the

²² Meaning surveys, questionnaires, interviews, ethnography etc; addressing innovative data capture eg SMS, video memo

²³ Drawn for example from PCT (card sorts, laddering), SSM (rich pictures), creative methods, in various media and formats, digital story-telling, photo-elicitation, in consultation with experts from for example the ESRC National Centre for Research Methods, the Centre for Mobilities Research, Lancaster University and the global HCI4D, m4d, ICT4D communities. This is only preliminary.

community could experiment, discuss, document and record between workshops, with

- the discussion and development of culturally appropriate research ethics protocols, leading to the synthesis of tools, methods and ethics specific to their community, culture and concerns, and then
- the exploration and documentation of the information needs and habits, the livelihoods, markets and occupations, the educational experiences and expectations; the infrastructure, access and environment; and of individuals and groups within the community [53], then leading to
- the selection, introduction, adaptation, evaluation and eventual integration of progressive digital learning tools and techniques, alongside training and supporting community members to populate, manage, curate, moderate and direct their own platform and space
- feeding the evidence, analysis and synthesis through to the policy and funding communities in ways that challenge the current filters, skews and biases currently constraining their opinions and values.

This differs from many earlier documented participative processes [54] in aiming to engage and empower communities, rather than deliver an artefact.

In more detail, the design process, in and between workshops, would enable the community to take greater and greater control and comprehension of the process and the outcomes as they, using the tools, first define the design space, that is as they identify the constraints, resources, limitations, expectations and experiences within which their design must take places, and then later, develop and document the heuristics for selecting resources (meaning, content, communities and tools) and then finally integrate, manage and learn within the space. Adaptations of agile techniques [55] would certainly be appropriate alongside other design approaches [56].

This too is not a *tabula rasa* but rather a framework into which existing communities could contribute their ideas and techniques, meaning that the initial phase must be reviewing what these might be. There are, for example, already critiques of existing design practices [57] and proposals Including education amongst indigenous communities [58] [59]; from fields outside education, often information systems [60], knowledge management [61] and indigenous knowledge [62] [63]. These and others all features elements of co-design and participation working with widely spread indigenous communities; they offer philosophical foundations and practical tools [64] [65]. There are already reviews that draw these together [66] as well as work that supports the mobile dimension [67]

7 Tools for Learning

The following list illustrates the diversity, richness and abundance of free tools and technologies that could support different activities and pedagogies available to constitute a digital learning space within an indigenous community,

- Hosting communities, a focus for content, resources and profiles, pointing to other tools: Elgg, Joomla, Facebook, Joomla, Drupal, WordPress.
- Hosting and managing content, different media, learners' and external content: Google Docs, SlideShare, Dropbox, Flickr, YouTube, Panopto, Acrobat Cloud
- Peer reviewing and rating, gamification, tools for encouraging comments and discussion of learners' work in progress: Easychair, CMT

- Curating external and local content, different levels of structure, complexity and sophistication: Zotero, Scoop.It, Flipboard, Pulse, Evernote, Pinterest, Google Currents, Diigo
- Connecting learners and content, facilitating seminars, discussions, meetings: Hangouts, Twitter, Skype, Adobe Connect, Slack, Basecamp, Gmail
- Facilitating quizzes, surveys and feedback: Survey Monkey, Socrative
- Helping learners manage, individually and in groups: Trello, SimpleMind+
- Facilitating content creation, for drafts, mixed media: Prezi, QuickOffice, Kingsoft Office, Slidrocket
- Finding content and communities: Google, Bing, Google Scholar
- Coordination and synchronisation, for meetings, discussion, support: Doodle, Eventbrite
- Suites combining email, calendar, tasks: Opera Mail, Evolution, eM Client, Inky

Some are of these universally recognised and generic, others specialised and specific; most are not educational in any formal sense; most are stable and well-established, levels of formality and sophistication vary widely. The categories are indicative not precise, and functionality often overlaps. Many communities might only use one or two. The list is intended to indicate that across the whole range of potential pedagogies and from entry level to postgraduate, the tools are waiting for whatever a community may want and need.

8 The Threats

These tools and processes that give communities their own learning spaces are brought together partly as a response to opportunities and resources but partly a response to threats and problems. We are conscious of the pressures and trends on mainstream economies and indirectly on more marginal and disenfranchised communities. These include the Internet of Things (IoT), artificial intelligence (AI), robotics [68] and more generally the so-called Fourth Industrial Revolution [69] alongside the ‘hollowing-out of the labour market’ [70]. Their impact is likely to be most problematic for those marginal and disenfranchised communities currently least able to respond, adapt and appropriate. This will include indigenous communities. This is perhaps the underlying message of the movement for critical digital literacy [71] but this message is least well developed and understood in the global South amongst the indigenous communities of the ‘the Fourth World’ [72] In some senses our ideas are the practical working out of that message for disparate, different, diverse and disadvantaged communities, empowering them digitally going forward.

To illustrate, one aspect of these threats, an earlier paper [73] looked at the interactions between mobile digital technologies, essentially Anglophone American technologies produced by global corporations, and languages, especially indigenous ones, marginal mother tongues and those of pre-literate societies. The paper collated observations that were ostensibly not-worth-mentioning or taken-for-granted, observations that technology is not necessarily benign or even neutral, and that technology skewed language and learning in a variety of ways, that usually favoured powerful mainstream interests. These included interfaces and interactions, graphical, textual and audio, that favour some languages, vocabulary, scripts, dialects and gestures over others, altering the balance amongst mother tongues, indigenous languages, national languages, lingua franca and global languages [74]and usually

reflect the hegemony of US English and its culture, values and gestures, of US digital technologies and global corporations, and indirectly of the international agencies and donors with whom they work [75].

This includes messaging, voice recognition, gestural interfaces, skeuomorphic icons and auto-correction, amongst other features but at a deeper level the technology, specifically the relationships between systems analysis, systems design, programming paradigm and programming language, were culturally specific [76] [77], placing the worldviews of indigenous, marginal or minority cultures at a disadvantage in comprehending, co-opting and controlling the digital technologies of the mainstream and global.

The concept of *epistemicide* [78][79] encapsulates a more profound threat, perhaps masquerading as the Fourth Industrial Revolution, to indigenous communities and highlights the impact of alien epistemologies, usually European ones, buried inside language, technology and learning, on indigenous cultures. OER, a specific and much vaunted technology for educational development in Africa, has been critiqued as *information imperialism* [80] and alerts us to be on our guard against *pedagogic imperialism* as we build our foundations for learning.

9 Policy and Funding

One objective of the work we outline is the possibility that we can help address the flawed relationship between researchers and activists working with and within marginal and indigenous communities and the policy, official and funding communities that interact with them. This has been an ongoing impediment to the lifestyles and livelihoods of marginal communities. A recent paper [81] outlined the problems with the relationships and transactions between these loosely defined communities [82] [83]. This not an area that is easy to objectively and systematically research or even document and thus draws on experience and expertise. Policy research will need continued progress on better tools and methods to reach more trustworthy conclusions [84]. The paper looked at different ways in which digital learning and research could be defined in order to draw out the policy implications, for example in terms of ministerial responsibilities or macro-economic benefits, seeking to explain and analyse different types of learning and research, for a policy audience, in terms of their implications for meaningful, appropriate, authentic and sustainable impact on indigenous and marginal communities.

It is often the case that academics and their institutions in the global South reproduce the practices and priorities of the global North but in a subordinate and subservient role, attempting to copy but always lower down any global league tables or international rankings [85]. They are however in a system where

- There are differing professional structures, careers, practices, rewards and environments for researchers and chronic under-funding, lack of networking, organisational under-capacity and low status of research
- Research funding, reporting, reviewing, networks, publication and dissemination favour the values and voices of the global North even when discussing the global South
- Projects and programmes in the global South are often staffed, managed and directed from the global North
- Funding, rewards and programmes skew research and deployment in favour of the scalable, success-driven technical-fix agenda

- Funders' preferences determine the trajectory of research and how they, because of their own funding, are predisposed to success, generalisability, uniformity, transferability, measurable outcomes and financial sustainability.
- The default research ethics, that we discuss elsewhere, are those of the literate, technically savvy and individualistic global North.
- Funders, in terms of their own abilities, accountability and constituencies, prefer simple, scalable and generalised causal relationships and explanations, and not multi-causality and 'unexpected consequences'.
- Researchers in the global North seldom understand the systems, values, structures and organisations within which colleagues in the global South work.

Indigenous and nomadic communities and their cultures are doubly disadvantaged by these characteristics being marginal to the institutions of their own countries. We hope that our proposed programme of improved research tools, techniques and ethics would enable more accurate and authentic evidence, reasoning and understanding of indigenous communities for officials, funders and policymakers at a national and international level.

10 The Network

We think there is the opportunity for a network at the *necessary and unique intersection and interaction* of community education, innovative research methods, policymaking, development studies and universal digital technology working for the development and support of local, marginal, indigenous and disadvantaged communities. There are at present no global agencies or institutions with a natural affinity to these positions and ambitions, nor any research networks at the intersection of development studies, education, research and technology.

We are hoping to build a network of civil society, voluntary sector and community groups, some in developing countries, some at the margins of the developed countries, for example Cree in Canada, Aboriginal in Australia and, in a different way, communities under occupation in Palestine. We hope to that this network could articulate and test the emergent concepts and practices we have outlined. There should however be no expectation that an over-arching theory, model or concept would emerge from across these communities or could be developed elsewhere; only the assumption that these various communities are at margins of the established, the powerful and the mainstream. We would make no assumptions about the nature of learning within any specific cultural context, only that all communities constitute spaces where necessarily information and opinions are acquired, produced and shared, nor any assumptions about preferences for local or external information or the pedagogies by which communities engage with it, nor any assumptions about which digital devices, systems or technologies communities can access and afford. The information in question may be local weather or scientific climate data, advice and prices for crops, guidance on techniques and tools, financial literacy and basic skills.

This is in fact an approach now favoured by some funders, for example in the GCRF calls²⁴ and the new EdTech Hub²⁵.

²⁴ <https://www.ukri.org/research/global-challenges-research-fund/>

²⁵ <https://edtechhub.org>

11 Tentative Ideals, Aims and Objectives

So we hope, building on a lot of earlier thinking [86][87] [88], to encourage the formation of a network that will promote sustainable and equitable livelihoods, activity and occupations by creating and adapting the research tools and methods that will enable activists and researchers to collaborate and develop community digital learning spaces that are based on the authentic and sensitive expression of economic, educational, environmental and cultural needs, aspirations, expectations and experiences. To summarise, one objective of our network would be to explore innovative and appropriate social research tools and techniques that might be exploited across the communities and to share ideas more generally enabling member communities to be more self-sufficient and to represent and be recognised as a more resilient, socially sophisticated and digitally articulate asset to their respective countries. Another objective would be to enable and empower disadvantaged communities to engage more effectively with the mainstream and the established in their countries, and the wider world, whilst ensuring their own local traditions, culture, livelihoods and language can still survive, adapt and flourish, balancing equity with sustainability. Such a network, given the collaborative nature of its ethos, methods, tools and ethics presents an interesting challenge in terms of governance and management [89].

An underlying objective in a conceptual sense is to explore, develop and apply Heeks' notion [90] of ICT4D 2.0, where he described a move from an ICT4D *pro-poor*, done on their behalf, towards an ICT4D *para-poor*, alongside them, or ICT4D *per-poor*, by them, to the Networks' governance and project management, and to its research methods and research ethics. Heeks also uses the analogy of the *long-tail*, the capacity of ICT to profitably respond to smaller and more diverse needs and communities, and this too is useful in how we think about governance, management and ethics, but also about learning. Heeks sees ICT4D moving into a new phase, which will,

... require new technologies, new approaches to innovation, new intellectual integration, and, above all, a new view of the world's poor. The phase change from information and communication technologies for international development (ICT4D) 1.0 to ICT4D 2.0 presents opportunities for informatics professionals and offers new markets for ICT vendors.

..... ICT4D 2.0 focuses on reframing the poor. Where ICT4D 1.0 marginalized them, allowing a supply-driven focus, ICT4D 2.0 centralizes them, creating a demand-driven focus. Where ICT4D 1.0 - fortified by the "bottom of the pyramid" concept - characterized the poor largely as passive consumers, ICT4D 2.0 sees them as active producers and innovators.

Within his notion of ICT4D 2.0 he sees

- *Pro-poor* innovation, outside poor communities, but on their behalf. (29)

- *Para-poor* innovation, done working alongside poor communities. (30)
- *Per-poor* innovation, within and by poor communities. (30)

Clearly, we favour *para-poor* or better still *per-poor* but no longer *pro-poor*. The ideas in this paper attempt to apply this simple message across all the domains of governance, methods, tools, learning and ethics and provide a framework and a focus for this.

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