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Review

A Critical Review of Mobile Learning: Phoenix, Fossil, Zombie or .....?

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Abstract: The established mobile learning paradigm is now two decades old; it grew out of the visions and resources of e-learning research communities in universities in the world's more economically developed regions. Whilst it has clearly been able to demonstrate many practical, pedagogic and conceptual achievements, it is now running out of steam. It has failed to adapt to a world where mobile technologies are pervasive, ubiquitous and intrusive and where people and communities can now own their own learning. This paper looks at the evolution of the established mobile learning paradigm and explores the current global, demographic, social and technical environment in order to develop a new paradigm more suited to the changed and changing realities and priorities. This is *mobile learning2.0*. The paper looks at the axioms and values of this paradigm and its possible tools and techniques. The treatment is discursive and critical. The paper reimagines the concepts and practices of learning with mobiles. It embraces many significant themes at a high level, including inclusive and equitable education; learning theories and design; pedagogical frameworks and methodologies; digital and media literacies; social media and learning environments; online collaboration and communities; Informal and formal learning.

Keywords: mobilities; mobile learning; paradigm shift

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1. A Provocation

A couple of years ago, Mark Pegrum approached me for a 'provocation' for the opening chapter of his then-forthcoming book [1]. With hindsight, it turns out to capture the big issues,

> *The 'long 16th century' in Western Europe, in particular the scientific revolution, was accompanied by several epistemicides, those events where a culture's understanding of the world was suppressed or destroyed.*
>
> *They took place within Europe, with the march towards the Enlightenment and the Industrial Revolution, and they took place outside Europe in the course of colonial expansion, as mercantile Protestantism emerged as the dominant epistemology, catalysing the Enlightenment, the nation state, high capitalism, and finally modernism, that world view that good and evil, cause and effect are easy, that history is going somewhere, that objective reality exists, that science and education are benign and that languages and symbols describe the world.*
>
> *In the global North, however the connectedness and mobility of near universal personal digital technology is now giving rise to partial, transient, subjective truths, as individuals and communities produce, discuss, transform and share information, identities, images, ideas and opinions, an Arab Spring for education for everyone, that threaten this modernity, replacing it with the liquid mobility where nothing ever settles.*
>
> *Meanwhile, in the global South, these same technologies are the mechanisms of new and renewed epistemicides as marginal, nomadic and indigenous cultures, languages and traditions become road-kill on the information superhighway, suffocated by global*

corporations and Anglophone technologies, designed in California and built in China (And we should have added, "..exploiting child labour in the Congo.").

This is perhaps an apocalyptic vision of the impact of pervasive and ubiquitous personal digital technologies on the world's societies, but in a historical context that includes, for example, the global impact of the printing press and the motor car is nevertheless appropriate. The current paper is not so melodramatic but does nevertheless deal with the same fundamental issues and consequences. These are the mismatch when we consider mobile digital technologies, between 'mobile learning' as an expression of an earlier static modernist world and the evolving wider mobile post-modernistic worlds beyond it. The background to the current paper is a growing discomfort with the established mobile learning paradigm. In a slew of recent papers and presentations, the author has attempted to document and dissect this discomfort from a variety of different perspectives. Their titles were indicative, for example, "The future already behind us" [2] and "What killed the mobile learning dream?" [3–6]. Now it feels that the time is ripe to move forward and begin to construct an alternative. The current paper is not a criticism of the people and the projects involved. It is a critique of the axioms and priorities as expressed or implied in the literature that espouses mobile learning in relation to the wider economic, social and political context in which it took place. It could be argued that this is setting up a strawman or caricature merely to knock it down. Perhaps. It is impressionistic and personal and so does not adhere to a focus on materials, methods and results. This allows a clearer articulation of the breadth of possibilities, and perhaps prompts clearer thinkers to debate the issues more rigorously.

2. Introduction

The title of this paper captures the crux of our question; namely, is 'mobile learning' as currently understood by its eponymous research community,

- A fossil, dead, and only of interest to historians and archaeologists;
- A zombie, clinically dead but still moving forward due to earlier momentum;
- A phoenix, arising anew but unchanged from its own ashes;
- A pupa, a new entity consisting of the old entity reconstituted.

We tackle this by looking at a critique of 'mobile learning' from both internal criteria—is it succeeding on its own terms, as the activities of a research community—and external criteria—is it succeeding on anyone else's terms, contributing to the world outside academia. We feel this is both an ethical and an intellectual imperative to help those global millions untouched by current 'mobile learning' research with their mobiles to improve the quality of their lives and livelihoods, and to seek greater intellectual rigour in addressing changing contexts and conditions. We ask whether this critique hints at the possibility of alternatives, a new paradigm, and whether the work of other disciplines can inform a more meaningful and worthwhile enterprise at the intersection of mobile digital technologies, learning (and knowing and understanding) and different societies and cultures. We have to recognise that this critique is subjective and impressionistic, the views of someone working in or around 'mobile learning' for two decades. After articulating a new paradigm for learning with mobiles, we close by looking at the tools and techniques that might deliver this new paradigm. We must, however, start with some history of 'mobile learning'. The paper follows loosely a linear 'background, methods, results, conclusion' format, but at a higher altitude where details and direction can be less precise.

3. Background: The Established Mobile Learning Paradigm

So, we start by outlining the history, form, and content of what we are calling the established mobile learning paradigm. It dates back to approximately 2001, the year of the first mLearn conference, held at the University of Birmingham in England [7]. We must remember that at this point, until perhaps 2008 (this is an arbitrary date and varies across definitions, countries, sectors and demographics), mobile technologies were expensive,

fragile, scarce, difficult and consequently the necessary experience and expertise were institutional and professional. This was an era when phrases like technology-enhanced learning (TEL) [8,9] had a meaning, drawing attention to the positive and noteworthy addition of digital technology, including mobile digital technology, to learning. Once technology becomes ubiquitous and pervasive, such phrases merely draw attention to the disconnect or inadequacy of education systems compared to the rest of society outside those education systems. As a forward reference, to be picked up later, we should remind readers that at a certain point, again perhaps 2008, mobile technologies became cheap, familiar, easy, robust, and personal, social and recreational, at which point the established paradigm of mobile learning started to get left behind. In a different sense, it was left behind as activity shifted away from research findings to business models and the centre of gravity shifted across the Atlantic, with the public take-up of the smartphone, as epitomised by the iPhone. The telling phrase, the apps economy, surfaced around this time [10].

To start at the beginning, the 'mobile learning' community's research agenda grew out of the aspirations and interests of the e-learning research community. It grew in an era when institutions of formal education were the recognised and obvious mechanism for increased social mobility, enlarged educational inclusion and increased economic opportunity for many people in our communities and in the few places where networked computers would facilitate this mobility, inclusion and opportunity [11]. We have argued elsewhere [12,13] that the mission of opportunity, participation and inclusion that characterised much educational policy and activity in 1990s was a failure in its own terms, but in the 2000s became increasingly irrelevant as the institutions lost their monopoly of the digital technologies that facilitated learning, especially facilitated learning for less privileged learners. This was the point in history where we argue that 'mobile learning' lost its relevance to the wider world.

As we have stated, initially 'mobile learning' emerged out of the e-learning communities of the global North leading up to the turn of the century and inheriting some of the e-learning visions, theories and personalities [14,15]. At this stage mobile learning bought into the prevailing ethos of small-scale and state-subsidised highly-theorised curiosity-driven trickle-down innovation, facilitated by researchers with the necessary technological and pedagogic skillsets, in research-active universities in some 'mobile learning' hot-spots, mostly western Europe, Asia Pacific and also in some more widely dispersed individual institutions [16]. This was an understandable response to the pressures and opportunities of the time and saw 'mobile learning' seeming to deliver on the promise of 'learning anytime anywhere' that had eluded the tethered e-learning [17] community, essentially however reforming digital learning rather than transforming it, offering not just 'learning anytime, anywhere' but soon 'learning-just-in-time' and 'learning-just-for-me' [18]. We argue that ultimately 'mobile learning' merely reconfigured the nature of the 'tethering', still tying learners to schools, colleges and universities, now physically off-campus but still connected to and dependent on enrolment, lecturers, curricular and assessment.

In this first decade, there were practical, pedagogic and conceptual achievements including demonstrations of ways in which formal education could be enriched by becoming more contextual, social, situated, authentic, personalised [19] and by augmented reality, recommender systems and real-time simulations. These did, however, in the course of the first decade of 'mobile learning' all evolve from experimental systems to retail commodities. In terms of theory, we saw the 'mobile learning' research community engaged with Activity Theory [20,21], the Conversational Theory [22,23], Actor Network Theory [24] and rhizomatic learning [25,26] and a socio-cultural ecology [27], amongst others. There were also demonstrations in the same accounts that mobile learning could not only transcend geographical or geometric distance but also social and economic distance, reaching out to different kinds of community, but as I myself pointed out in the USAID mEducation Alliance keynote of August 2012, this was always 'our' learning not 'theirs'.

The 'mobile learning' community however did not move with the times, as we said earlier, as mobiles transitioned from being fragile, scarce, difficult, complex and expensive,

to being cheap, easy, robust and universal; nor did it respond the withering of state enthusiasm and state resources entering the second decade of the century. One major missed opportunity was the exploration of 'contextual mobile learning' as a sustainable pervasive collaborative social experience of locality, environment and history [18] as location-aware smartphones became widespread in Europe.

Furthermore, the community did not make the transition from the web1.0 world, where the majority consumed what the minority produced, to the web2.0 world, where the majority consumed what anyone and everyone produced. This is perhaps a different way of asserting that universal mobile technology challenged the monopoly on learning previously held by education systems. Either way, the apparent benefits of 'mobile learning' did not trickle down from the global North to the global South, in spite of the mobile's intrusive ubiquity in most of the communities of the South from the very earliest days. What was true of the hardware—it became cheap, easy and robust—also became true of the software. In fact, increasingly non-technical users were shielded from complexity as the simplicity of interactions became paramount as the permutations and possibilities of functionality became saturated.

There were inherent contradictions in this first decade and these are part of the explanation of the failure to move forward. In these early formative days, the most trustworthy evidence came from research that used the same consistent hardware platform, that is the same mobile device, provided by the project, across the whole population of research subjects, that is the learners, thus eliminating device-variety as a confounding variable. This was however not a realistic scenario. Scaling up and sustainability depended on learners using their own diverse and ever-changing platforms, the bring-your-own-device (BYOD) scenario [28]. The paradox was that the best evidence was the least useful. This was however only relevant within the closed domains of formal education. Increasingly these closed domains became permeable as mobile phones became pervasive and ubiquitous in students' lives in the real, outside world. The positivist mindset of researchers was progressively less useful as the post-positivist world leaked into the classroom and the lecture theatre. So, at the risk of parody, the positivist researchers were increasingly enclosed in a post-positivist world, and their largely psychological perspectives were failing to keep up with sociological realities. This change was transforming learners with no mobile experience or expectations, into learners with enough mobile experience and expectations to overwhelm the pre/post empirical settings for the dedicated educational app under investigation [29]. Research could no longer rest on the assumption that learning with mobiles was somehow disconnected from the outside world.

A further irony was the status of 'disruption' within the mobile learning research community [30], which was touted as a significant attribute of mobile learning in its first decade. Disruption is either 'weak', meaning classes being disrupted by incoming calls, or 'strong', meaning the authority of the teacher being challenged by alternative sources of information, was to be a major stimulus and provocation to conservative education systems. The irony was that this talk of 'disruption' was coming from established academics entrenched in apparently secure and conservative institutions which might themselves later be disrupted by the new epistemologies of pervasive movement and connectedness.

We can look at the demographics and bibliometrics of the published 'mobile learning' research community and these too are sometimes worrying, with authors, speakers, reviewers, editors, publishers, and readers from the global South under-represented in the journals and conferences actually devoted to their own region, or not devoted to thinking about their region in the ways that they themselves thought about it. There is also a perception that could be tested statistically or bibliometrically, namely that the literature of 'mobile learning' has become largely conservative and self-referential, feeding off itself for ideas and authority. A look at my own bibliometrics served up by Google Scholar might make this point indirectly. I have written on mobile learning for over two decades and have well over 9000 citations. When I look at which papers are getting cited, it is overwhelmingly those from the first decade, those that mostly dealt with pedagogy and technology, were

upbeat and were generally endorsing and analysing 'mobile learning', rather than those from the second decade, dealing with wider societal, ethical, critical and philosophical issues. The latter were, I must admit, downbeat and have not made much of an impression, suggesting that researchers seem happier continuing to buy into the established version of 'mobile learning' rather anything that might unsettle it.

There have been objective bibliometric analyses of the literature of 'mobile learning', some merely giving researchers guidance on improving their citations [31], others showing the distribution of clusters, key words, hot-spots and emerging topics. There seem to be only nine significant but weakly connected clusters of collaborators and co-authors in a small number of countries [32]. All of these results seem to favour the countries of the Pacific Rim. The ten most cited papers all pre-dated 2013 [33], whilst the research paper output may have decreased since about 2015 [32] or continued to grow [33] though from a low base [34]. In the most recent results, covering the last decade [35] four clusters of topics were identified: concepts of m-learning, applications of m-learning in education, designing framework for learning/acceptance and emerging technologies. The analysis of keywords underlines our point about lack of engagement with the social, cultural and economic concerns of the wider world as opposed to education within the education system, usually the higher education system. These observations seem do however strongly dependent on the methods and provenance, and any inferences should not be taken too seriously. Perhaps bibliometric analysis cannot answer our questions, namely is 'mobile learning':

i. Self-referential, a closed community mostly just citing itself?
ii. Backward looking, referring mostly to key early papers?

The answers must depend on expertise and experience.

In terms of the wider impact of mobile learning, we should however also look at how 'mobile learning' research was funded, how it interacted with the policymakers, and how policy was formulated—how in fact policy and research fed off each other [36,37].

Another way in which the mobile learning research community may not have moved with the times, certainly in European countries including the UK, was adapting to the changing ethos of national research funding, as it changed from a single-discipline, blue-skies ethos to a multidisciplinary, challenge-based, impact-driven agenda. This translated as a focus on working across disciplines, working with non-academic partners, addressing major global and societal challenges like forced migration, food security and climate change, and on being able to demonstrate the high likelihood of major change and improvement in the relevant policy or practice. This was, we argue, not something that the mobile learning research community responded to very effectively.

In the first decade of 'mobile learning', alongside the small-scale research projects, there were also larger-scale programmes using mobiles to reach specific disadvantaged demographics. The nature of their funding meant they were less committed to rigorous evaluation or to widespread publication, and they too were probably hit by the global economic downturn post-2008. The trends skewed 'mobile learning' research away from the marginal and the peripheral and were driven by the appetite for projects reported as successful case-studies with simple outcomes, for American English as the medium for research publication [38] (and its relationship to global league tables for universities), for conference presentations from researchers with travel budgets and for university systems that recognised the value of research alongside teaching or management.

Furthermore, there has been little or no evidence that the community of mobile learning researchers ever recognised or resolved the conflicting imperatives of sustainability, equity, quality and scale—any given project or initiative could perhaps achieve two but never three or four and unfortunately these are usually the policy priorities of any national education system, any educational institution or funding agency.

As stated earlier, the year 2008 marked a transition. On the one hand, the global economic downturn and shifts in government thinking in many countries led to a dramatic reduction in the public money going into 'mobile learning' innovation and research in the global North. On the other hand, global agencies and international development

ministries finally noticed mobile technologies as a way to deliver their humanitarian and educational missions. This led to a shift in focus to the global South. But the pressures for scale and sustainability, on and from these agencies and ministries, expressed as 'system strengthening' and 'service delivery', reinforced traditional didactic teaching based on schools and content, but not so much on livelong, adult or informal learning, nor for marginal, peripheral or indigenous communities and their languages. Looking at the impact of 'mobile learning' on mother tongues, indigenous cultures and nomadic peoples; or even just those countries, communities and individuals away from the large, the norm and the mainstream, we conclude that 'mobile learning' is skewed away from these countries, communities and individuals, and instead is usually skewed in favour of Anglophone American interests or the global North more generally [39,40].

This then is a subjective account of mobile learning in its first two decades. And this critique may be equally true or relevant to other niches that prospered in the TEL research environment at the end of the last century.

4. Methods: The Two Criteria

Our critique has two strands, the internal and the external:

- In its own terms, by asking, if 'mobile learning' as a research community has been intellectually and logically coherent and convincing?;
- In the terms of the people, communities and cultures outside those of the established research community, by asking the question, did 'mobile learning' do them any good?

So, on the first question, was 'mobile learning' logically coherent and convincing? Elsewhere [41,42] we have explored whether 'mobile learning' has run its course as a paradigm, perhaps using 'paradigm' in a less grandiose sense than the canonical version [43], more akin to how software engineers would use it [44–46]. Of course, it was never an explicitly articulated paradigm, and we have to infer its axioms, adherents, research questions and foundational texts from the indirect evidence, both formal and informal. Nor was it ever completely coherent, consistent and homogeneous. The ongoing disputes around definitions underline this, whilst they also strive to embrace and replace all their predecessors, never however freeing themselves of their e-learning parentage or of education predicated solely on the work of educators (for example, [47]). Furthermore, definitions do not happen in isolation, but rather attempt to show how a paradigm is different and distinct from it 'parents', 'siblings' and rivals, in this case from tethered e-learning [42]. There is, of course, also always likely to be a difference between the espoused definition and the one enacted. Nevertheless, at this point we maintain our assertion that 'mobile learning' as widely understood, has failed. Our suggestion elsewhere [41] is that 'mobile learning' as a paradigm has reached the end of its research agenda and is ripe for a 'paradigm shift'.

As we implied earlier, mobile learning's foundational axioms were situated in settings where mobile devices were scarce, fragile, difficult, expensive, where learning with mobiles was innovative and institutional (and research was the consequence of specific economic and political conditions) and where the research community's mind-set was a legacy or inheritance from 1990s e-learning. Mobile learning, defined in general terms to be learning mediated by personal connected mobile digital technologies [19], has now ironically become static, stuck in institutions that are not moving forwards, doing what it did ten years ago but to ever-smaller audiences. Authors still refine their definitions of 'mobile learning', but our worry is that these all treat learning itself as unchanged and unchallenged [42]. While there is a plethora of different definitions, some key characteristics can be identified, namely that learning can be extended in terms of its reach or catchment and enhanced and enriched in terms of its experience [39] Implicit in these definitions is however little evidence that learning itself is changing as the nature of society changes together with its relation to technology within it. This is a key difference between the established 'mobile learning' paradigm and a world where mobiles, mobility and connectedness change what is learnt, how it is learnt, who it is learnt from, why it is learnt, where it is learnt and how

this learning is used and valued, essentially how mobiles, mobility and connectedness change the epistemological foundations of our worlds and cultures.

On the second question, we are asking both, has it been of value to countries, communities and cultures, especially those most marginal and disadvantaged, and does it understand and represent those countries, communities and cultures, specifically in how they generate, share, evaluate, express, transform, manage, control and own the knowing and the finding out that form the foundations of their learning. That might in some senses be asking whether 'mobile learning' has a moral purpose rather than an intellectual purpose, which might in turn be asking whether in the current language of our funders whether it makes an 'impact' or just a 'contribution to knowledge'.

We have addressed both these points elsewhere, but to reiterate briefly, the technologies of mobile learning, and also the policies and funding [36], are systematically skewed away from those languages and traditions, from those communities, countries and cultures most different and distant from the global and national norms [43] in terms of language, livelihoods, social interaction, social practices and values, both expressed explicitly as laws and tacitly as norms. The focus of 'mobile learning' research has mostly been enriching the learning experience of college and university students rather than primary school children and their parents, teachers and community members.

This is not to say that the mobile learning research community did not engage with indigenous or other marginal communities. It did, on many occasions, for example, Māori [48], Cree [49], aboriginal communities in Australia [50–52] and earlier, 'travellers', meaning circus folk and homeless people, in England [53], but this, to a greater or lesser extent, seemed to use 'mobile learning' as outreach or access for the mainstream education system rather than the integration of mobile technologies into local pedagogic and epistemological practices. There is, at best, an ambivalence between these two perspectives that hints at a paradigmatic uneasiness and a parallel with critiques of the inclusion, participation and opportunity agendas in UK and European higher education [13,54].

We should also note that early 'mobile learning' theorising was dominated by European names, though we should also recognise contributions from the highly sophisticated Pacific Rim (viz. [11,21,55]). This was, as we noted earlier, a consequence of the 'mobile learning' hot-spots and the funding and political environments which nurtured them. An antidote to these is now a growing decolonising movement [56,57], but this has not yet reached a position where individual cultures and communities have explored the interaction between mobile digital technology and many local and indigenous knowledge systems. This would however certainly be valuable because there is an argument that for fragile, peripheral and indigenous communities, cultures and languages, pervasive mobile technologies and everything that comes with them, represent the next recolonization of knowledge and epistemicide [40,58,59]. This is the epistemicidal threat we mentioned in our opening.

Some earlier papers [60–62] coming out of a prestigious STELLAR Alpine Rendezvous workshop, explored the ongoing global crises, the ecological, economic, political crises, and asked whether TEL, and 'mobile learning' in particular, were complicit in these crises, whether the TEL research community saw itself, saw technology, research and education as unconditionally benign, scientifically dispassionate and objective. Our view was certainly that 'mobile learning' research and its publications are short of any wider criticality, beyond that of their own internal academic rigour.

We argue also that 'mobile learning' in the ways it is funded, staffed, published, incentivised and managed, often disadvantages research by, from and amongst the disadvantaged—as opposed to research on or to the disadvantaged—though this would be true of much other education research especially on the global South.

To put it another way, mobiles are transforming the 'knowledge economy', the processes by which knowledge is manufactured, distributed and consumed, from a system focused on the prestigious knowledge factories of the global North to a decentralised globally dispersed craft system or cottage industry based on barter and gift. To pursue the

metaphor, educators must move away from head office and become 'barefoot educators' in the digital villages [63].

Our ongoing disquiet can be crystallised around a few key concerns, in relation to the enacted formulation of 'mobile learning', rather than any specific or individual projects or programmes, some intrinsic, some extrinsic, some objective, some impressionistic, and they are generalisations. These are:

- The lack of new ideas, specifically breaking out of subsidised small-scale fixed-term interventions or the development of apps, a reaction to papers and presentations, 'haven't we already done this?'. A closer search on bibliometric data might reveal a self-referential academic and intellectual community and discourse. Looking at Google Scholar hits on 'mobile learning' would reveal only a handful of papers published in the current decade.
- The lack of impact, relevance and sustainability. This is of course difficult to prove, and the absence of evidence is not the evidence of absence. The take-up of 'mobile learning' has been limited to pockets of specialist courses where the strategic or economic drivers justify the ongoing cost. Of course, impact, relevance and sustainability were not the necessary attributes of any research activity, certainly not of research activity within an essentially modernist, curious-driven and largely positivist philosophy, but the growing emphasis of research funders on multi-disciplinarity and global challenges does not put the 'mobile learning' research community in a strong position.

There are others, perhaps a lack of concern for equity, lack of methodological innovation, lack of recognition of the changed political and economic zeitgeist post-2008, failure to recognise the changed demographics of mobile technologies, failure to recognise historical forces of capital at work underneath education and technology [58], failure to work in wider cultural contexts in particular those of the communities and concerns local to the global South and the disadvantaged; the characterisation of evidence as basically 'fluffy', not getting out of a quasi-scientific mode of empirical work in ways that would give confidence to policymakers, manager or journalists [64].

It might be argued that these concerns could be resolved by technical fixes, quantitative changes and minor adjustments but we argue that the world has moved on too much and that something more dramatic is now needed.

5. Results: A New Paradigm—Mobile Learning2.0

We are arguing now for a new mobile learning paradigm, *mobile learning2.0*. This must grow out a changed understanding of our world, a world now characterised by incessant movement and perpetual connectedness, a world where the modernist European enlightenment no longer has its former global authority. So, the foundational axiom for our new paradigm is underpinned by a comprehensive worldview based "five highly interdependent 'mobilities' that form and re-form diverse networks:

- corporeal travel of people for work, leisure, family life, pleasure, migration and escape;
- physical movement of objects delivered to producers, consumers and retailers;
- imaginative travel elsewhere through images of places and peoples upon TV;
- virtual travel often in real time on the internet so transcending geographical and social distance;
- communicative travel through person-to-person messages via letters, telephone, fax and mobile." [65]

These mobilities transform the foundations of learning and knowing. Whilst it is easy to read them as applicable to the affluent global North, we read them as globally applicable and prioritise the less affluent in order to 'level up'.

The ethos of 'mobile learning' is based on understandings of a static Eurocentric worldview that are no longer relevant.

Our foundational axiom, adapted from an earlier work [41] is;

> *in most societies today, characterised as they are by permanent, ubiquitous and pervasive connectedness and mobility, . . . learning and digital technology are no longer separable or discrete; they are merely aspects of the ways things now are, skewed however by the powerful interests that control bandwidth and connectivity, that control the design and manufacture of technology, that control education systems and economic opportunities.*

We say that learning, digital technology and society are fused and inseparable; one is never found without the other two, though the learning may not be the recognised or authorised form, it is nevertheless out there.

In the context of a paradigm, this axiom only has to be plausible, not objectively or verifiably true; it has to be more useful and effective in resolving discrepancies and discomforts than the earlier paradigm, namely those discrepancies and discomforts of 'mobile learning' outlined earlier. This new paradigm cannot be empirically proven because it is the paradigms that define the framework by which any empirical evidence is understood, not the other way around. In fact, the relationship between two paradigms might be comparable to that between rabbit and the duck in the popular visual ambiguity [66], except that here experiences irreversibly shift the perception from the older to the newer.

A paradigm's primary role is defining a research agenda and its research questions. In our case, these are, (adapted, abbreviated and revised from [41]).

Firstly, 'what characterises and differentiates these societies, from each other and from earlier models of society?', and in terms, for example, of social practices and norms, political organisation and activity, economic transactions and commodities, expressive and creative genres, the nature of culture and hegemony, the nature of epistemology and ontology, that constitute the rationale, the contexts and the foundations of learning; in terms, for example, of the nature of exclusion, development, disenfranchisement and disadvantage, and of capital(s), power and privilege; in terms, for example, of our ideas of self, identity, community, relationships, and in order to help understand, the paradigm shift being outlined, how does our depiction of societies align or interact with other depictions of societies, perhaps the postdigital or futures [67]?

Secondly, in the context of the mobile perspective on societies and cultures, 'what is the nature of learning, and what is its purpose?' which leads to more specific and practical questions about the definition and nature of epistemology, pedagogy and didactics, and then how 'should we conceptualise the roles and responsibilities of educators, their organisations and institutions, and their practices and procedures, such as courses, exams, qualifications?' and 'what is the nature of learning within our paradigm in relation to existing pedagogic theories such as connectivism, constructivism, heutagogy etc.?'

Thirdly, 'what is the nature of language?', meaning 'what are the symbols, conventions, interactions, contexts, media and gestures that constitute the language used to exchange meaning and feeling, that underpin learning, knowing and understanding, transmitting and preserving them? 'How do we understand the status of dialects, lingua franca, mother tongues, indigenous languages and global power languages in a world where so much language is mediated digitally? What and who now owns, shapes and controls language?' 'How, to focus on technological aspects, do real-time translation, voice activation, auto-correct, emojis and home automation change, for example, the nature of language, community and communication, and consequently of learning [68]?' and given the implicit postmodernity of our axiom, 'what is the nature of language in shaping the society we describe in our axiom, compared to the modernist position that language merely records it?'

Whilst language has always been in some senses the property of some hegemony, the current hegemons are mostly anglophone global digital corporations and our axiom explicitly recognises and problematizes this observation. Language is the medium of learning and of research.

So we ask, fourthly, 'what is the nature of research?', that is, 'what are the methods, tools and techniques; what constitutes proof, reason, logic, trustworthiness and authority?' How do we explore the changed human condition and its social context?' 'How in practical

terms, would the research community operate in a world of fractured fluidity? Are journals, conferences, studentships and the other formats still adequate? Are questionnaires, surveys, focus groups, semi-structured interviews and other accepted research tools still sufficient?' We have made an opportunistic attempt, prompted by the needs of the pandemic, to start to explore this issue and map some principles and some possibilities [69].

We need these as the basis for researching and supporting learning, howsoever this is now understood.

These are not new questions—there is no reason why they should be—but the old questions addressed within the context of the new paradigm's defining axiom and ethos. They are ambitious for an educational paradigm but remember that there is, for example, a straight line from mobile digital technology to increased popular radicalism via the Arab Spring and the cyber-Intifada, and from global corporate capitalism to fragile mother tongues via the information superhighway. This now has added impetus as responses to COVID-19 re-invigorate every aspect of conventional institutional digital learning whilst ignoring the potential for innovative and inclusive learning with mobiles outside conventional educational institutions.

The consequences of articulating this paradigm are not only the formulation of a new research agenda, but also the development of scholarly community and the foundational texts. Furthermore, an open and resilient paradigm should look to other disciplines, beyond the historical e-learning research communities, for stimulation, tools, concepts, methods and collaborators. The most obvious community is the mobilities turn within sociology [70–72]. This not only espouses mobility and connectedness as the defining characteristics of our world and its societies but currently also lacks any significant learning dimension [73,74]. Other kindred and complementary communities are those advocates of critical pedagogies with digital interests [75,76], and researchers in the m4d, ICT4D [77] and HCI4D communities [78,79] with interests in learning and decolonisation [80,81], perhaps decolonising the curriculum, perhaps decolonising research methods. This resonates with our desire to see a mobile learning paradigm that makes no Eurocentric or Northern assumptions, and recognises the unique and universal place of mobile digital technologies, a counterbalance to the schools, state education systems and scaled corporate digital learning that are the strongholds of the established 'mobile learning' paradigm.

6. Tools and Techniques to Deliver This New Paradigm

Having briefly addressed which other schools and disciplines might inform or support our new paradigm, it is important to also review the tools and techniques that might enable its adherents to actually deliver it. There are, of course, some caveats. One is the need to recognise cultural and contextual specificity; not to impose general, static or universal solutions, in fact not to impose anything, but to look for methods and formats that will enable community appropriation and sustainable ownership, and enable collaborative adaptation and participative development. Another is to build for change, indeed for instability, transience and chaos, and specifically now to recognise that the current global pandemic means that no trends or projections can be trusted, that both the central focus of learning with mobiles on pedagogy and technology and its surrounding penumbra of society, culture, economics, nations and politics will transform and that the existing distribution of educational, digital and economic capital will be disturbed and disrupted, most likely in favour of those with most already.

Whilst these remarks sound like the language of enlightened international development directed at marginal communities in the global South, they are intended to be read as applying as much to the global North, its marginal communities and its mainstreams. Our argument is that mobility and a new worldview mean that we have to start from scratch, from a tabula rasa, in understanding learning needs, their specific cultural contexts and the forces that shape, press and distort them. It is, however, logical, methodological and ethical to start from the perspectives of the disadvantaged or the marginal of the global South and North, their people and communities, since not only does this more starkly expose the

forces at work in our societies but also it addresses the biggest challenges first making later, smaller ones easier.

Our proposal here is outlined in three stages. The first is to argue that the research tools and techniques that we currently use to understand the lives of people and their communities are based on a static, stable, Eurocentric and supposedly homogeneous, or perhaps hegemonic, view of the world and its cultures and that in a mobile and culturally heterogeneous world, a palette or portfolio of more appropriate research tools and techniques are needed, appropriate to each different culture, each mobile and learning in its own way [69]. This in turn argues for the research ethics and research governance that are aligned to this new ethos. The second is to argue that that the ubiquity, pervasiveness and universality–nearly–of personal mobile digital technologies means people are familiar and confident with a wide variety of web2.0 applications, functions and affordances, which they already use to create images, ideas, information, identities, communities and opinions and to share, review, transform, merge and discard them [82]. The third is to argue that there is a host of emerging and innovative pedagogic ideas coming out of web2.0 technologies that are suitable for adapting and combining to suit specific cultural and environmental contexts [83] in ways that would enable any community, including the most remote or the most mobile, to create, develop and control their own digital learning spaces [84,85]. This host is not definitive. It was chosen to represent possible pedagogies that give agency and autonomy to mobile learners in our mobile societies, rather just those 'tethered' to an institution of formal learning, reflecting a web2.0 world not a web1.0 world. It was also chosen to give access and opportunity to communities, North and South, further from the dominant mainstreams of the global digital.

The roles and responsibilities of researchers—and of innovators, activists and advocates—in the new mobile learning paradigm are to facilitate processes by which learners with their personal technologies and in amongst their mobile communities can define, own, produce, share and consume their own learning, can learn from each other, their experiences and their environment, physical and digital.

7. Conclusions: What Next?

This paper is the result of much activity and reflection over two decades; it is the consolidation of one phase in learning with mobiles and the outline for the next. It was written in the hope that it would spark debate and provoke change. The answer to our opening question is, we hope, 'pupa', a new entity, *mobile learning2.0*, consisting of the old entity, 'mobile learning', *mobile learning1.0*, reconstituted. The connection to the opening quotation [1] should now be more explicit; mobile digital technologies are globally ubiquitous and pervasive, and our societies are in motion and connected. There are threats and there are opportunities—*mobile learning2.0* represents an appropriate response to all of these.

In terms of the immediate plans, the nature of opportunities, resources, contingencies and principles argue against a coherent, disciplined strategy, in favour of incremental, inclusive and pragmatic approaches. The focus will be the establishment of a UNESCO Chair in 'innovative informal digital learning in disadvantaged and development contexts', the establishment of a network fostering the development of the 'grass-roots' research tools that will enable communities to exploit external pedagogic and technological expertise, of strengthening links with such bodies as the UK Edtech Hub and the Commonwealth of Learning, and exploiting a new mailbase, CRIT-DIGIT-LEARNING-RESEARCH4DEV@jiscmail as a focal point.

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References

1. Pegrum, M. *Mobile Lenses on Learning*; Springer: Singapore, 2019.
2. Traxler, J. Mobile Learning—The future already behind Us. In Proceedings of the 7th International Conference on Interactive Mobile and Computer Aided Learning, Amman, Jordan, 6–8 November 2012.
3. Traxler, J. What Killed the Mobile Learning Dream? Available online: https://medium.com/@Jisc/what-killed-the-mobile-learning-dream-8c97cf66dd3d (accessed on 6 September 2021).
4. Krull, G. Mobile Learning Has Dtalled. Available online: https://mlearningstudy.wordpress.com/2016/03/17/mobile-learning-has-stalled/ (accessed on 29 February 2016).
5. Atwell, G. Mobile Learning—The Dream Goes On. Available online: https://www.pontydysgu.org/2016/02/mobile-learning-the-dream-goes-on/ (accessed on 9 November 2016).
6. Hall, R. Towards a Critique of Mobile Learning. Available online: http://www.richard-hall.org/2011/12/07/towards-a-critique-of-mobile-learning/ (accessed on 6 September 2021).
7. Naismith, L.; Corlett, D. *Reflections on Success: A Retrospective of the mLearn Conference Series 2002–2005*; HAL Archives Ouvertes: Banff, AB, Canada, 2006.
8. Kirkwood, A.; Price, L. Technology-enhanced learning and teaching in higher education: What is 'enhanced' and how do we know? A critical literature review. *Learn. Media Technol.* **2014**, *391*, 6–36. [CrossRef]
9. Bayne, S. What's the matter with 'technology-enhanced learning'? *Learn. Media Technol.* **2015**, *401*, 5–20. [CrossRef]
10. Genachowski, C.J. *Mobile Broadband: A 21st Century Plan for US Competitiveness, Innovation and Job Creation*; Speech, New America Foundation: Washington, DC, USA, 2010.
11. Keskin, N.O.; Metcalf, D. The current perspectives, theories and practices of mobile learning. *Turk. Online J. Educ. Technol.* **2011**, *102*, 202–208.
12. Traxler, J. Inclusion, measurement and relevance . . . and COVID-19. *Postdigital Sci. Educ.* **2020**, *3*, 27–35. [CrossRef]
13. Traxler, J. Inclusion in an age of mobility. *Res. Learn. Technol.* **2016**, *24*, 1–18. [CrossRef]
14. Kukulska-Hulme, A.; Sharples, M.; Milrad, M.; Arnedillo-Sánchez, I.; Vavoula, G. Innovation in mobile learning: A European perspective. *Int. J. Mob. Blended Learn.* **2009**, *1*, 13–35. [CrossRef]
15. Wong, L.H. A brief history of mobile seamless learning. In *Seamless Learning in the Age of Mobile Connectivity*; Springer: Singapore, 2015; pp. 3–40.
16. Boekholt, P. The evolution of innovation paradigms and their influence on research, technological development and innovation policy instruments. In *The Theory and Practice of Innovation Policy*; Smits, R.E., Kuhlmann, S., Shapira, P., Eds.; Edward Elgar Publishing: Cheltenham, UK, 2010.
17. Ozuorcun, N.C.; Tabak, F. Is m-learning versus e-learning or are they supporting each other? *Procedia Soc. Behav. Sci.* **2012**, *46*, 299–305. [CrossRef]
18. Traxler, J.; Kukulska-Hulme, A. *Mobile Learning: The Next Generation*; Traxler, J., Kukulska-Hulme, A., Eds.; Routledge: New York, NY, USA, 2015.
19. Traxler, J. Learning in a mobile age. *Int. J. Mob. Blended Learn.* **2008**, *1*, 1–12. (In Arabic) [CrossRef]
20. Chung, C.J.; Hwang, G.J.; Lai, C.L. A review of experimental mobile learning research in 2010–2016 based on the activity theory framework. *Comput. Educ.* **2019**, *129*, 1–13. [CrossRef]
21. Sharples, M.; Taylor, J.; Vavoula, G. Towards a theory of mobile learning. In Proceedings of the mLearn, Venice, Italy, 17–24 October 2015; Volume 1, pp. 1–9.
22. Winters, N. What is mobile learning. In *Big Issues in Mobile Learning*; LSRI: Nottingham, UK, 2007; pp. 7–11.
23. Laurillard, D. Pedagogical forms of mobile learning: Framing research questions. In *Mobile Learning—Towards a Research Agenda*; Pachler, N., Ed.; University of London: London, UK, 2007; pp. 153–175.
24. Wright, S.; Parchoma, G. Technologies for learning? An actor-network theory critique of 'affordances' in research on mobile learning. *Res. Learn. Technol.* **2011**, *19*, 247–258. [CrossRef]
25. Mbati, L. Rhizomatic principles in mLearning: A synthesis of existing qualitative research. In *The Mobile Learning Voyage—From Small Ripples to Massive Open Waters. mLearn 2015*; Brown, T., van der Merwe, H., Eds.; Springer: Singapore, 2015.
26. Engeström, Y. Wildfire activities: New patterns of mobility and learning. *Int. J. Mob. Blended Learn.* **2009**, *1*, 1–18. [CrossRef]
27. Pachler, N.; Bachmair, B.; Cook, J. *Mobile Learning: Structures, Agency, Practices*; Springer Science & Business Media: Berlin/Heidelberg, Germany, 2009.
28. Traxler, J. Students and Mobile Devices. *Res. Learn. Technol.* **2010**, *18*, 149–160. [CrossRef]
29. Basoglu, E.B.; Akdemir, O.A. comparison of undergraduate students' English vocabulary learning: Using mobile phones and flash cards. *Turk. Online J. Educ. Technol.* **2010**, *9*, 1–7.
30. Cochrane, T. M-Learning as a catalyst for pedagogical change. In *Handbook of Mobile Learning*; Routledge: New York, NY, USA, 2013.
31. Elaish, M.M.; Shuib, L.; Ghani, N.A.; Mujtaba, G.; Ebrahim, N.A. A bibliometric analysis of m-learning from topic inception to 2015. *Int. J. Mob. Learn. Organ.* **2019**, *13*, 91–112. [CrossRef]
32. Goksu, I. Bibliometric mapping of mobile learning. *Telemat. Inform.* **2021**, *56*, 101491. [CrossRef]
33. Sobral, S.R. Mobile learning in higher education: A bibliometric review. *Int. J. Interact. Mob. Technol.* **2020**, *14*, 153–170. [CrossRef]

34. Hung, J.L.; Zhang, K. Examining mobile learning trends 2003–2008: A categorical meta-trend analysis using text mining techniques. *J. Comput. High. Educ.* **2012**, *24*, 1–17. [CrossRef]
35. Khan, F.M.; Gupta, Y. A bibliometric analysis of mobile learning in the education sector. *Interact. Technol. Smart Educ.* **2021**, ahead of print. [CrossRef]
36. Traxler, J. Mobile learning research: The focus for policy-makers. *J. Learn. Dev.* **2016**, *3*, 7–25.
37. Lomas, J. Connecting research and policy. *Can. J. Policy Res.* **2000**, *1*, 140–144.
38. Bennett, K. Towards an epistemological monoculture: Mechanisms of epistemicide in European research publication. In *English as a Scientific and Research Language: Debates and Discourses*; Alastrue, R.P., Perez-Llantada, C., Eds.; De Gruyter: Berlin, Germany, 2015; pp. 9–36.
39. Traxler, J. Learning with mobiles in the digital age. *Pedagogika* **2018**, *68*, 293–310. [CrossRef]
40. Traxler, J. Learning with mobiles: The global south. *Res. Comp. Int. Educ.* **2018**, *13*, 152–175. [CrossRef]
41. Traxler, J.; Read, T.; Kukulska-Hulme, A.; Barcena, E. Paradoxical paradigm proposal. *Argent. J. Appl. Linguist.* **2019**, *07*, 89–109.
42. Traxler, J. Mobile learning: The philosophical challenges, problems and implications of defining and theorising. *S. Afr. J. Open Distance Learn. Pract.* **2018**, *38*, 17–33. [CrossRef]
43. Kuhn, T.S. *The Structure of Scientific Revolutions*; University of Chicago press: Chicago, IL, USA, 1970.
44. Petre, M. A Paradigm, please—And heavy on the culture. In *User-Centred Requirements for Software Engineering Environments*; Springer: Berlin/Heidelberg, Germany, 1994; pp. 273–284.
45. Rajlich, V. Changing the paradigm of software engineering. *Commun. ACM* **2006**, *49*, 67–70. [CrossRef]
46. Wernick, P.; Hall, T. Can Thomas Kuhn's paradigms help us understand software engineering? *Eur. J. Inf. Syst.* **2004**, *13*, 235–243. [CrossRef]
47. Peng, H.; Su, Y.J.; Chou, C.; Tsai, C.C. Ubiquitous knowledge construction: Mobile learning re-defined and a conceptual framework. *Innov. Educ. Teach. Int.* **2009**, *46*, 171–183. [CrossRef]
48. Crow, T.; Parsons, D. A mobile game world for Māori language learning. In *International Conference on Mobile and Contextual Learning*; Springer: Cham, Switzerland, 2015; pp. 84–98.
49. Koole, M.; wâsakâyâsiw Lewis, K. Mobile learning as a tool for Indigenous language revitalization and sustainability in Canada: Framing the challenge. *Int. J. Mob. Blended Learn.* **2018**, *10*, 1–12. [CrossRef]
50. Townsend, P. Travelling Together and Sitting Alongside: How Might the Use of Mobile Devices Enhance the Professional Learning of ABORIGINAL and Torres Strait Islander Pre-Service Teachers in Remote Communities? Ph.D. Thesis, Flinders University of South Australia, Adelaide, Australia, 2017.
51. Johnson, G.M.; Oliver, R. Cognition, literacy and mobile technology: A conceptual model of the benefits of smartphones for Aboriginal students in remote communities. In Proceedings of the EdMedia+ Innovate Learning Association for the Advancement of Computing in Education (AACE), Victoria, CB, Canada, 24 June 2013; pp. 1273–1278.
52. Reedy, A.K. Rethinking online learning design to enhance the experiences of Indigenous higher education students. *Australas. J. Educ. Technol.* **2019**, *35*, 132–149. [CrossRef]
53. Attewell, J.; Webster, T. Engaging and supporting mobile learners. In *Mobile Learning Anytime Everywhere: A Book of Papers from mLearn 2004*; Learning and Skills Development Agency: London, UK, 2005; pp. 15–19.
54. Traxler, J.; Vosloo, S. Introduction: The prospects for mobile learning. *Prospects* **2014**, *44*, 13–28. [CrossRef]
55. Ally, M. Using learning theories to design instruction for mobile learning devices. In *Mobile Learning Anytime Everywhere: A Book of Papers from mLearn 2004*; Learning and Skills Development Agency: London, UK, 2005; pp. 5–8.
56. Langdon, J. Decolonising development studies: Reflections on critical pedagogies in action. *Can. J. Dev. Stud.* **2013**, *34*, 384–399. [CrossRef]
57. Heleta, S. Decolonisation of higher education: Dismantling epistemic violence and Eurocentrism in South Africa. *Transform. High. Educ.* **2016**, *1*, 1–8. [CrossRef]
58. Hall, B.L.; Tandon, R. Decolonization of knowledge, epistemicide, participatory research and higher education. *Res. All* **2017**, *1*, 6–19. [CrossRef]
59. Hall, B. Beyond Epistemicide: Knowledge Democracy and Higher Education. Available online: https://dspace.library.uvic.ca/bitstream/handle/1828/6692/Hall_Budd_BeyondEpistemicide_2015.pdf?sequence=2 (accessed on 6 September 2021).
60. Hall, R. On the Secular Crisis and a Qualitative Idea of the University. Available online: http://www.richard-hall.org/tag/history/page/4/ (accessed on 6 September 2021).
61. Lally, V.; Traxler, J. TEL—The crisis and the response: An introduction. *Interact. Learn. Environ.* **2016**, *24*, 935–937. [CrossRef]
62. Traxler, J.; Lally, V. The crisis and the response: After the dust had settled. *Interact. Learn. Environ.* **2015**, *245*, 1016–1024. [CrossRef]
63. Henning, E. Walking with "barefoot" teachers: An ethnographically fashioned casebook. *Teach. Teach. Educ.* **2000**, *16*, 3–20. [CrossRef]
64. Guardian Signal Poor on m-Learning's Impact, the Guardian. Available online: https://www.theguardian.com/education/2012/mar/13/mobile-learning-research-language-teaching (accessed on 6 September 2021).
65. Urry, J. *Mobilities*; Polity Press: Cambridge, UK, 2007.
66. Gopnik, A.; Rosati, A. Duck or rabbit? Reversing ambiguous figures and understanding ambiguous representations. *Dev. Sci.* **2001**, *4*, 175–183. [CrossRef]

67. Traxler, J.; Connor, S.; Hayes, S.; Jandrić, P. Futures studies, mobilities, and the postdigital condition: Contention or complement. *Postdigital Sci. Educ.* **2021**, 1–25. [CrossRef]
68. Traxler, J. Learning with mobiles in developing countries—Technology, language and literacy. *Int. J. Mob. Blended Learn.* **2017**, *9*, 1–15. [CrossRef]
69. Traxler, J.; Smith, M. Data for development: Shifting research methodologies for COVID-19. *J. Learn. Dev. Issue* **2020**, *7*, 306–325.
70. Sheller, M. From spatial turn to mobilities turn. *Curr. Sociol.* **2017**, *65*, 623–639. [CrossRef]
71. Sheller, M.; Urry, J. The new mobilities paradigm. *Environ. Plan. A* **2006**, *38*, 207–226. [CrossRef]
72. Jensen, O.B. *Mobilities*; Routledge: London, UK, 2015.
73. Brooks, R.; Waters, J. *Materialities and Mobilities in Education*; Routledge: London, UK, 2017.
74. Danaher, P.A.; Moriarty, B.; Danaher, G. *Mobile Learning Communities: Creating New Educational Futures*; Routledge: London, UK, 2009.
75. Farrow, R. Open education and critical pedagogy. *Learn. Media Technol.* **2015**, *42*, 130–146. [CrossRef]
76. Lewin, D.; Lundie, D. Philosophies of digital pedagogy. *Stud. Philos. Educ.* **2016**, *35*, 235–240. [CrossRef]
77. Heeks, R. ICT4D 2.0: The next phase of applying ICT for international development. *Computer* **2008**, *41*, 26–33. [CrossRef]
78. Beale, R.; Dearden, A.; Dray, S.; Jackson, A.; Jones, M.; Kam, M.; Abdelnour-Nocera, J.; Winters, N. Human-computer interaction for development (HCI4D): Who, what, where, when and how. In Proceedings of the Conference on Computer Human Interaction (CHI09), Boston, MA, USA, 4–9 April 2009.
79. Chetty, M.; Grinter, R.E. HCI4D: HCI challenges in the global south. In Proceedings of the CHI'07 Extended Abstracts on Human Factors in Computing Systems, San Jose, CA, USA, 28 April–3 May 2007; pp. 2327–2332.
80. Abdelnour-Nocera, J.; Densmore, M. A review of perspectives and challenges for international development in information and communication technologies. *Ann. Int. Commun. Assoc.* **2017**, *41*, 250–257. [CrossRef]
81. Lazem, S.; Giglitto, D.; Nkwo, M.S.; Mthoko, H.; Upani, J.; Peters, A. Challenges and paradoxes in decolonising HCI: A critical discussion. *Comput. Support. Coop. Work* **2021**, 1–38. [CrossRef]
82. Traxler, J.; Scott, H.; Smith, M.; Hayes, S. Learning through the Crisis Helping Decision-Makers around the World Use Digital Technology to Combat the Educational Challenges Produced by the Current COVID-19 Pandemic. Available online: https://wlv.openrepository.com/handle/2436/623926 (accessed on 18 November 2020).
83. Traxler, J. Only connect: Indigenous digital learning. *Interact. Des. Archit.* **2019**, *41*, 7–23.
84. Traxler, J. Community MOOCs—Back to basics, back to the future. In *The 2018 OpenupEd Trend Report on MOOCs*; EADTU: Maastricht, The Netherlands, 2018.
85. Traxler, J.; Crompton, H. *Critical Mobile Pedagogy: Cases of Inclusion, Development, and Empowerment*; Routledge: New York, NY, USA, 2020.