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Future-Present Learning in Place: postdigital learning at the scale of the city

Pen Lister[1][0000-0002-1071-693X]

[1] University of Malta, Msida MSD 2080, Malta.
Email pen.lister@penworks.net

Abstract. This paper critically reflects on future-present learning in place situated in the context of postdigital learning at the scale of the city [1]. The terms 'future-present' and 'postdigital' are used to attempt to encapsulate re-imagining possible futures of civic learning in urban places, situated within a technology-infused future learning city environment. Acknowledging a high level of uncertainty [2], it is argued here that we must re-imagine and investigate alternative visions of what might be possible or desirable to implement a smarter, more effective and efficient learning in place in near-future learning cities, to plan and adapt for how this future could play out, and mitigate challenges that may arise. Seeking to step out from 'business as usual' interpretations and taking a lead from innovative projects, literature and media debates, a speculative vision is outlined for a civic learning network to provide seamless, low friction learning in a smart future city. Context is placed on the importance of the web of knowledge as the foundation of any system of civic learning implementation, the role of the open social web to support citizen participation, and the potential responsibilities of platform infrastructure as part of their relationship to future technosocial contracts and citizen digital epistemic rights.

Keywords: knowledge commons, knowledge web, smart learning, ubiquitous learning, civic learning, learning cities

1 Introduction

This paper considers 'learning in place' in contexts of smarter learning cities that are open and technically enabled to offer ubiquitous interactivity with knowledge resources via any suitable technological infrastructure. In order to provide this kind of seamless knowledge interaction for citizens, ideas are outlined for a speculative 'civic learning network' (CLN). Key areas discussed within this context are related to user requirements, digital literacies and open, fair access to the knowledge web. Subsequent challenges that may arise are considered, such as providing more effective, useful recommender systems, particularly within a user data rights and anonymity setting. The epistemic responsibilities related to a CLN are explored, including questions concerning curation and maintenance of the integrity of the knowledge web; 'artificial intelligence' considered in relation to potential impact on recommender systems; and the possible role of a CLN in a future technosocial contract for citizen digital epistemic rights, supporting democratic engagement and ontological security.

Urban geocoded knowledge content can already be effectively discovered and delivered using various methods[1] to enhance a casual learner's experience of place. Adding open social web communication offers potential for citizen contributions to the knowledge of place, and argument is made in this paper that building an open civically-owned interactive learning network can act as a cornerstone of urban democratic belonging and ontological security, within what a future learning city for all sections of the learning society could become [1, 3–6]. Drawing on a variety of similarly themed learning city orientated research and community initiatives, this paper reflects on how we can move forward to achieve a flexible, technologically hybrid solution for civic learning, supported by a Human-Technology Interaction (HTI) integrated approach (e.g. [7]). Contributions to ideas, and highlighting possible limitations, may assist in pointing the way to future directions for realising the provision of CLNs within a new technosocial contract of knowledge and the fourth generation human right for citizen access to trustworthy epistemic information [8, 9].

The background of the author is a multimedia professional and interdisciplinary higher education academic with experience in using technology to support learning in place [10]. This provides sufficient layman's practical awareness of what might be possible or desirable in conceptualising a CLN, but perhaps without detailed awareness of challenges that might be encountered in relation to some ideas outlined.

1.1 Lifelong learning in place

Learning in place forms a natural part of urban technological infrastructure in the smart learning city, occupying a key aspect of smart learning literature debates. Emphasis in research is often placed on developing new interactive smartphone apps, online learning platforms or ways of delivering smart 'personalised learning' based on user data (e.g. [11, 12]). Learning in place may not only be about 'being in place', but also incorporate learning about a place while being in another place, as it might be that learning cities together form local, national or international networks [13, 14], or that someone in one city might find something of relevance in a place in another city [15].

Facer & Buchczyk [1] reflect on "the way the materiality of the city 'itself' educates", that a "concept of the city as a site that 'educates attention' (where) learning is reframed as a process of dwelling in the city", and the 'key issue' that "learning is framed as a co-emergence between the people and the materiality of the city" (p. 161). They and others consider lifelong learning as a significant aspect of learning in place and learning cities, not only as part of formal education to emphasise employ-

[1] Technology such as augmented reality smartphone camera image recognition, textual recognition, geocoded location data, sensors, beacons, QR codes or SMS notifications all offer mechanisms for knowledge related to place to be delivered to a user's smartphone while they are in place.

ment skillsets, but as incidental or unplanned learning, motivated by natural curiosity rather than any idea of training or teaching (e.g. [16, 17]). The possible reasons why people engage with knowledge 'for its own sake' are probably infinite, however we need only examine Facebook groups based on knowledge and place, for example archaeology, architecture, photography, general arts, socio-cultural history, cities, towns and more, to find evidence of how much people love to engage with knowledge about places. All of those aforementioned groups would benefit from a digital infrastructure for learning in place. This paper considers this kind of incidental learning, that happens every day with a Google search [18], visit to a cultural heritage website, social media discussion, or shared images about places, as the learning that may be most impacted by a CLN.

1.2 Why a learning city?

According to Facer & Buchczyk [1], learning cities have their roots in the critical pedagogy of the 1970's [19], and the conceptual belief that social change can be best achieved in urban contexts. In subsequent years initiatives such as the UNESCO Global Network of Learning Cities[2] are now promoted as centralised policy bodies to support social change and economic development. However, there is a tension around why learning cities exist, that "the development of international networks and benchmarks for what should constitute a learning city might be seen as a practice of colonialism and coercion [1]. Citing various other related work, they go on to note there should be "a richer more complex normative vision for a Learning City as engaging not only with preparation of citizens for economic competition, but with political and experiential education … environmental awareness and sustainability … and with the more emancipatory goals of critical adult education traditions" [1].

Decentralised (localised or specialised) networks of learning in and between cities [20] may bring advantage to both citizens and to the ad-hoc varied purposes of learning that can manifest as citizen-led activities and knowledge generation, separate from formal learning or even any declared purpose of learning. Surely this complements Freire's 'liberating pedagogy' that "cannot be developed or practiced by the oppressors. It would be a contradiction in terms if the oppressors not only defended but actually implemented a liberating education" [19]. If every learning city was imbued with a CLN, they could potentially digitally federate together with others at local or regional scale. This would create an affordance for a citizen-led curated custodianship of the urban knowledge web between all learning city network instance infrastructures, decentralised in ownership and authority, adopting the app and platform interoperable model of the open social web utilised in the Fediverse [21].

[2] UNESCO Learning Cities https://www.uil.unesco.org/en/learning-cities

2 Future-Present postdigital learning in place

Future present learning in place is a vision of what can manifest as learning in place based on and inspired by a different vision to that which already exists. For example, to reinvent a future that is not based on current conjecture or supposition about cost, types of learning or civic educational expectations as they exist now. It is the opposite of 'present future', a future version of the present rooted in present understanding and assumptions about 'how things work'. We need to explore the future in the present [22], by thinking of smart cities in the 'future present' [23], to anticipate learning and teaching postdigital hybridities and prepare for them in the present [24]. This 'future-present' vision is 'latent and changing', but "can be recognized and foreseen, thus impacting the present by entering into it and being used in the present', in contrast to the 'present future' of 'pre-given futures' rooted in the past as 'linear continuations of the past in the present" [2].

Jandrić et al. [25] observe that we are "somewhat weary of various post-concepts" because post-industrial societies "have not in any way left the smokestack era of factory production". However in this paper 'postdigital' is a useful term, interpreted as a blend of Negroponte's 'being digital' as only noticeable by its absence [26], and Cramer's interpretation of 'post-digital' as "a media aesthetics which opposes … high-fidelity cleanness" [27]. This is Townsend's vision of the smart city, with its 'motley assortment of activists, entrepreneurs, and civic hackers … tinkering their ways toward a different kind of utopia' [28]. The citizen-hacker led approach toward utopia is somewhat reflected in the work of Soch et al.'s [7] utopian collective intelligence for 'future human-technology interaction design'. Conceptually, future-present postdigital learning in place considers a CLN as being a manifestation of a 'city as interface' [29], where digital interactions with knowledge resources and networked communities are pervasive, platform and app agnostic, available at point of need or interest, and may be engaged with by any user at any time. Ideally civic learning technical infrastructure is owned or co-owned by citizens in a decentralised federated network model, forming part of a technosocial contract of citizen human rights to the knowledge web.

2.1 Postidigital epistemological context

The postidigital epistemological context of this paper can be considered as the pervasively persistent human/technological urban future city lifeworld, a digitally integrated landscape of citizen and object data, in a 'mediatic surfaces' infused built environment [30–32]. Smart city epistemological work has postulated a variety of data-driven learning contexts (e.g. [11, 12, 33], however ideas such as the 'Frictionless Learning Environment & Activity Theory' (FLEAT) model and 'Ambient Theory' [34, 35] position learning to be a pervasive flow of citizen interactivity within a 'heightened awareness' ambience of interactive agency in the digitised city. This theoretical understanding of human-technology interaction relationships that acknowledge the hybrid complexity of interdependent human/technology inter-

face/data-reliant awarenesses complements how this paper considers the epistemological backdrop for discussion in a postdigital smart urban environment. It is the ebb and flow of need, curiosity and interest mediated by ad-hoc interactions with "technologies supporting enhanced awareness and spaces accommodating more aware people and their multisensorial capabilities" [35], that perhaps might also be referred to as a postdigital 'situated literacy'[36].

3 Understanding urban citizen learning

Urban citizen learning should encourage learners to explore their 'objects of vital interest' [37] in a context of value, engagement and intrinsic motivation [38]. Interactions with a CLN should support transversal skills, fostering a critical curiosity and 'learning-to-learn' mindset in a culture of wellbeing and self-realisation [39–43]. This learning is unplanned, as Pyyry suggests, a sudden event of 're-cognizing ordinary everyday environments', further citing Ingold [44], who discusses knowing by dwelling, … (s)kills are developed in being, in involved activities and while relating to everyday situations…" [4]. To reiterate, the focus of learning in this paper is predominantly on learning that can happen anytime, by anyone for any reason, and while this is mostly considered as implicit or incidental learning, it may also form a part of student directed or problem solving pedagogical strategies in formal education. Lui et al. provide a clear definition between formal and informal smart learning, framing this as explicit and implicit learning. They declare that "a smart learning system includes two aspects: school smart learning system and social smart learning system", defining explicit learning as 'what people normally think of as formal learning' that often happens in school, and implicit learning as social learning, often happening 'in an environment of community learning, enterprise (work) learning, and learning in public places' [33]. This acknowledges the "incidental or random learning that results from ordinary life activities" or events not designed as educational activities, or designed as 'covert' learning [17, 45]. Eyal & Gil [46] argue "learning can be unintentional and exist within authentic activity, context, and culture", and "focuses on the relationship between learners as autonomous, proactive entities (and) produces an infinite potential of learning possibilities, but not necessarily those realised in an educational, institutional context" [46].

A CLN should be envisaged in a context of side-stepping assumed limitations, accepted past ways of doings things or simply imitating them with added technology [47]. However in recent years there has been renewed interest "to recover and learn from past examples of research and practice in city-wide thinking about education" [1]. We can find inspiration to implement a CLN system through being informed by innovative projects from the past. Projects highlighted here serve to provide ideas that when combined help to produce a potential blueprint for a CLN.

Hidden Cities[3]: Part of the 'PUblic REnaissance: Urban Cultures of Public Space between Early Modern Europe and the Present'[4] project, Hidden Cities provides a relevant example of history-in-urban-places mediated by technology. Five participating cities in the Netherlands, Germany, Spain, Italy and the UK provided smartphone apps to enable citizens to access historical content related to specific places while traversing the streets of each city. The Hidden Cities example offers a glimpse of what a smarter city could provide to its current and future citizens, if technological infrastructure enabled access to creating, consuming and interacting with a CLN.

The Zone of Possibility: Cook, Lander & Flaxton [15] proposed use of a location-based technology app within 'Zones of Possibility', a way by which we might think of locations, areas, terrains and local places that can be smart learning spaces within urban environments not imbued with technical infrastructure of themselves, yet provide possible interactive local social learning within arts and cultural contexts. To paraphrase their description: *"As you move around the streets with the app, media is triggered that invites viewing, comment and response, offering a chance for informal learning. You may view content, comment on it or make and share your own media to contribute ideas. There are two modes, 'walking' and 'armchair'. Armchair mode can be accessed from anywhere - e.g. someone in Athens might be interested in seeing if there is any transferable knowledge in Bristol. Walking mode allows for discovery through the triggering of content based on physical location and time. The app can be set to surprise you, or you can tell it that you want to know something"* [15]. This summary indicates several key aspects: access via GPS triggering or via anywhere, social interactions and contributions, and the potential importance of serendipity for knowledge delivery.

The Urban Belonging Toolkit: Discussed in Madsen et al. [48], the 'Urban Belonging Toolkit' is a 'toolkit for studying place attachments with digital and participatory methods', involving citizen generated content to engage with urban planning feedback. Use of an app[5] and website[6] for photo and voice commentary is distributed to citizen communities to input their own image content along with accompanying comments and observations. The research and app were particularly aligned with under-represented groups of Copenhagen, self-described as "marginalized as part of their life … (including) LGBT+, deaf, ethnic minorities, mentally vulnerable, physically disabled, international expats, and or houseless". The project demonstrates a thoughtful approach to use of citizen digital interactive knowledge content contributions and shows culture mapping in contemporary citizen perspective settings.

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[3] Hidden Cities https://hiddencities.eu

[4] PURE, funded by the Humanities in European Research Area (HERA), through the 'Joint Research Programme', Public Spaces: Culture and Integration in Europe https://heranet.info/projects/public-spaces-culture-and-integration-in-europe

[5] Urban Belonging smartphone app, Play Store & App Store: https://play.google.com/store/apps/details?id=com.urbanbelonging.app; https://apps.apple.com/dk/app/urban-belonging/id1573456017

[6] Urban Belonging website https://urbanbelonging.com/

Los Angeles Civic Memory Working Group[7]: This project concerns capturing and maintaining the civic history of the city of Los Angeles [49]. It was particularly orientated towards the populations who historically originally populated the Los Angeles area and involved engaging with the citizens themselves in addition to experts and specialists. Geddes [50] continually extols the virtues of not forgetting the city of the past, and this project offers an idea of how civic memory can play an important role in compiling the heritage of the city from the perspective of the citizens who have lived there, to build an environment of caring, flourishing and belonging [51].

Creative City Network of Canada[8]: Discussed in Duxbury, Garrett-Petts & MacLennan [36], the Creative City Network is an example of how to develop a national network of cities with creative purpose and initiatives. Of several 'toolkits'[9] available, the cultural mapping toolkit is particularly relevant. Cultural mapping (a technique used in the Urban Belonging toolkit), is a way of remapping a local territory "to make visible the ways local stories, practices, relationships, memories, and rituals constitute places as meaningful locations" [52]. In the Canadian example, there is a fully developed network of content knowledge repositories and support for various initiatives going back more than twenty years.

The common themes of these projects indicate creative ideas for citizen participation in knowledge of place, contributing to discussions, image banks, videos, events and urban planning concerned with local places, with varying degrees of top-down and bottom-up organizational control. This paper poses questions about what we can learn from these exemplary projects to build an innovative and effective CLN, taking the best ideas and thinking in new ways to bring them to greater and more sustained fruition, for the benefit of future citizens.

4 Building a civic learning network

An urban technological infrastructure imbued with digital knowledge connectivity can be imagined with as many interaction opportunities as there might be objects, artifacts and locations, in a built environment that affords digital micro-interaction knowledge delivery and community interactions. The realisation of a CLN should be in the context of a city as interface [29], where digital knowledge interactions are available at point of need or interest, are platform and app agnostic, and where learning is 'usually unintentional rather than deliberate', and 'anchored in a context of social meaning' [46]. This can also involve digital/physical hybrid spaces of engagement opportunity such as zones of possibility [15], city-wide collaborative learning [53] or 'learning regions' and 'creative cities', "ushering in place-based strategies to exploit local creativity and social capital to achieve a "new urban vitality" [54].

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[7] The LA Civic Memory Working Group http://civicmemory.la/

[8] Creative City Network of Canada https://www.creativecity.ca/

[9] Creative City Network of Canada toolkits https://www.creativecity.ca/libraryold/tool-kits/

A CLN in today's urban environment might need to provide a number of user functionalities that in the past were not present in the expectations of the user (or the researcher). For example, being able to upload as well as search and download content to and from a knowledge network, filter and save searches, contribute to discussions, ask or answer questions, add images to discussions or topic areas, and perhaps the option to do all this and more anonymously, with a temporary or 'pseudo' username (e.g. [55]). Ideally, digital knowledge web repositories, social communications and user interfaces should embrace a platform and app agnostic interoperable relationship between knowledge and social interaction - a ubiquitous integration of the open knowledge and open social web. This would perhaps be achieved through mutual ActivityPub protocol[10] CRUD[11] interactions, adopting the model of the Fediverse [21]. Table 1 provides a broad indication of what might be offered and available as core functionalities of a CLN.

Table 1 Core functions of a proposed civic learning network

Civic Learning Network (CLN) Function	Description
Camera/ image triggering for place-related (and geocoded) *Knowledge Search & Delivery Technology*[12] (KSDT)	App and platform agnostic access to Google Lens[13], Bixby Vision[14] or other camera/ image triggering for geo-coded or otherwise place-related knowledge search and delivery
Open API[15] plugin(s) between KSDT and any Learning Management System (LMS)	Any LMS could be used in conjunction with KSDT. (Moodle[16], Blackboard Learn[17], Canvas LMS[18] etc., with e.g. web entity detection & Cloud Vision[19].)
Open API connection with social media and forums	To permit any social media or forum app to be used in conjunction with KSDT and the CLN, likely via ActivityPub protocol. E.g. WordPress ActivityPub[20] integration to the Fediverse.
User functions for KSDT interactivity	Additional KSDT inbuilt user functions: search, enhanced search, save as, share, add to group(s), download, contrib-

[10] ActivityPub Protocol https://en.wikipedia.org/wiki/ActivityPub
[11] CRUD https://en.wikipedia.org/wiki/Create,_read,_update_and_delete
[12] KSDT refers to knowledge content search and delivery mechanisms, e.g. via AR triggered interface; offering key results related to a trigger plus further functionality for a web entity
[13] Google Lens https://lens.google.com
[14] Samsung Bixby Vision https://www.samsung.com/global/galaxy/apps/bixby/vision/
[15] Open API https://en.wikipedia.org/wiki/Open_API
[16] Moodle LMS https://moodle.org/
[17] Blackboard Learn LMS https://blackboard.com
[18] Canvas LMS https://www.instructure.com/en-gb/canvas-overview
[19] Cloud Vision web entity detection https://cloud.google.com/vision/docs/detecting-web
[20] WordPress & ActivityPub https://techcrunch.com/2023/09/14/wordpress-blogs-can-now-be-followed-in-the-fediverse-including-mastodon/

	ute, upload, camera integration etc.
Smart KSDT recommendations	Smart recommendations, including refreshed serendipitous suggestions based on anonymised user data, popular hits, outlier hits etc.
Smart KSDT metadata	Making use of RDF & OWL[21] social platform metadata properties in addition to e.g. OER Schema[22] for rich snippet results related to geocoded/place-related web entities

Civic learning network interface and functional design/development might utilise the collective intelligence of citizens themselves for defining and refining their own optimum information interaction requirements, perhaps somewhat like the approach utilised by Soch et al. [7] or Madsen et al. [48].

4.1 Citizen interactions with the knowledge web

This paper proposes that citizen critical hybrid digital literacies could be supported, developed and embellished through use of ubiquitous CLNs, connecting places and things with smartphone apps, learning management systems and the knowledge web[45]. Citizen understanding and curiosity for different types of knowledge, contexts of culture and social domain might be assisted by 'normalising' knowledge inquiry in 'ordinary everyday environments and activities' [4], and by placing greater emphasis on the contributions of citizens themselves to their own shared knowledge of place. Further, it builds and sustains the ontological security of identity referred to by Shotter, "to sustain their identities, the ontological security of their social being, they must sustain … (that is) morally respect both the identities of those around them, and the social relations which sustain those identities" [6].

The knowledge web is interpreted in this paper as the full sum of all open knowledge on the World Wide Web (WWW), available via browsing, searching, linkback[23] or social web sharing. User-generated knowledge content contributions are considered as an informal part of this resource. This is the broadest way that the whole of open digital knowledge might be defined, and is the interconnected knowledge resources to "search, read, (and) synthesize" in hyperspace [56]. Mioduser et al. call this 'hyperacy', and foreground today's heightened multi-awareness 'post-digital situated literacy' (after [35, 36]), noting the "dissonance between formally acquired and actually required skills for everyday life in the knowledge society", and prompting us to provide "the intellectual tools comprising the cognitive toolbox of hyperacy" [56].

Eisenstadt & Vincent [57] refer to the 'Knowledge Web' as a taxonomy based system of connected knowledge, with 'psychological agents' to undertake tasks for

[21] RDF & OWL Explainer https://www.linkeddatatools.com/introducing-rdfs-owl/
[22] Open Educational Resources Schema https://oerschema.org/docs/
[23] Linkback: https://en.wikipedia.org/wiki/Linkback

knowledge delivery to the user, envisaged as a closed database system. Nowadays we regard the whole of *'the internet'* as consisting of networked knowledge units (nodes), connected via strong or weak ties (edges), using various semantic and technical methods. In addition to publisher or platform taxonomies, methods such as metadata, URI and DOI[24], Linked Open Data[25], linkbacks[23], search keyword relevance, place-name or geocode relatedness, popularity of search result or social web sharing and rating statistics can all be used to connect and deliver knowledge content. Recommender systems as knowledge delivery mediators therefore become integral to interacting with the knowledge web. Subsequent following sections focus on recommender systems in the potentially required conditions of anonymised user data, privacy protection, and the increased understanding of the importance of serendipity as a part of search result suggestions [58]. The roles that Large Language Model[26] trained artificial intelligence (AI) tools might play are considered, particularly in light of possible impact on the integrity of the knowledge web.

5 Intelligent cities & citizen data

In considering intelligent systems that support learning, constraints may arise due to the conditions that exist today that may not have been pertinent in prior system design or planning. These include potential socio-political aspects of funding and technical infrastructure ownership, custodianship and maintainability of knowledge content quality and integrity, issues relating to intellectual property and AI use of web based digital content, user interactions data in terms of processing, rights, and privacy, and those relating to aspects of digital sovereignty.

5.1 Recommender Systems

Search result recommender systems that might be best employed in a CLN would most likely be based on anonymised user profile interactions and employ a system whereby related topic results could be offered that include opportunity for surprise and further exploration. Duricic et al. [58] emphasise that "accuracy may not always be the most important criterion" of graph neural network (GNN)[27] based systems, as "aspects such as recommendation diversity, serendipity, and fairness can strongly influence user engagement and satisfaction". Within the context of diversity (of content) and fairness (of returned results against others), serendipity would seem to be of most significance for CLN recommendations, as it "indicates the unexpected nature of recommendations, (and) encourages users to explore beyond their usual preferences and stimulates curiosity" [58]. GNNs use 'collaborative filtering' techniques, that begin with data preprocessing of "user-item interaction data and auxiliary information such as user/item features or social connections" [58]. Duricic et al. demonstrate vari-

[24] DOI/URI, e.g. in https://wiki.lyrasis.org/display/VIVO/Concept%3A+DOI+vs+URI
[25] Linked Open Data https://en.wikipedia.org/wiki/Linked_data#Linked_open_data
[26] Large language model https://en.wikipedia.org/wiki/Large_language_model
[27] Refer for GNNs and different types of web entity https://distill.pub/2021/gnn-intro

ous approaches of utilising collaborative filtering relating to diversity, serendipity and fairness that may be relevant to a CLN, however these may depend on scale of data and user demographic factors. User group size, age, language(s), types of knowledge being sought, and role for the open social web may impact recommendation techniques and results for different user groups in a CLN context. Recent studies concern proposed use of social networks and community orientated collaborative filtering methods, with work by Sheng et al. [59] appearing of interest (though this author is not sufficiently technically literate to judge in detail). Their proposal of item attribute interpretations in contexts of user-user relationships seems relevant in light of prior comments about CLN community and user differences.

Anonymised User Data. Anonymity of the user would appear desirable in a large and open CLN. Literature indicates the increasing concern around user data rights and privacy. Citing various others, Müllner et al. [60] state that "previous research has revealed multiple privacy threats for users in recommender systems, such as disclosure of users' private data to untrusted third parties and inference of user gender or age, and that "users themselves care more about their privacy in recommender systems". Müllner et al.'s work provides us with a review of mechanisms for obscuring user data via differential privacy techniques (describing the patterns within the group while withholding information specific to individuals)[28]. Van der Nagel [55] discusses user profile pseudonymity, suggesting that platforms encourage particular kinds of engagement through framing identity information of users, and that user multiple identities are becoming commonplace. Discussing 4chan's[29] default 'anonymous' user profile setting, she makes the case for how user profiles are distinct from user identity, and argues for the importance of 'pseudonymity' online. Though this would benefit from further research in the context of a CLN, it hints at an idea of offering a one-off auto-persona generated sign-in, with no other data required. Whilst it may be that by connecting to a CLN via a smartphone app or LMS system would include more personalised user data being held in those platforms or apps, the CLN itself would not hold any of that data within its own system.

5.2 Preserving the integrity of the knowledge web

The preservation of the integrity of the knowledge web is considered of significant relevance and importance to a CLN, as the knowledge web acts as the foundation of any system of civic learning implementation, and is the cornerstone of open knowledge node delivery in contexts of urban citizen learning at point of need.

Quality and Trustworthiness of Knowledge. The safeguarding of the continued authenticity and maintainability of the open web of knowledge is increasingly viewed as potentially under threat in relation to 'poisoning' of the information sphere through influx of low quality data output from 'generative foundation models' [61]. This

[28] Differential Privacy https://en.wikipedia.org/wiki/Differential_privacy
[29] 4chan https://en.wikipedia.org/wiki/4chan

might in part be regarded as a manifestation of the tragedy of the knowledge commons [62–64], and though by no means a certain outcome, discourses in literature [65, 66] and media [67–70] have begun to voice various serious concerns.

Mainstream technology and news, topic interest blogs and university website articles continue to debate problems of safeguarding web knowledge content quality and integrity, or other AI generative foundation model (GFM) limitations (e.g. [71, 72]. Information generated by GFMs is a 'blurry jpeg, rendering a 'glitchy, spammy, scammy, AI-powered internet' [73]. For example, the rise of AI fake news and 'pink slime' (content produced solely by GFMs), interspersed with 'real' news content highlights the intense challenge of users being able to differentiate between GFM content, intentional fake content and authentic content [74]. Full Fact[30] produces guidelines to counter fake content, including how to spot deepfake videos and images, or misleading/false information. Though done with the best intentions, it appears woefully inadequate in the face of the increasing amount of fake content on the WWW. Whilst the problem of fake content is not confined to GFM output, it may well increase exponentially due to GFM output, impacting quality and trustworthiness of the knowledge web. From a technical perspective, obtaining 'clean' training data, that is, human created content, is becoming a challenge for AI GFMs [75, 76]. Training GFMs have other problems, such as cost, accuracy, and removing or countering bias in the data being used for training [72, 77, 78]. Chatbot hallucination (making things up) continues to be a challenge [71], and national security is of concern in relation to ChatGPT or other text based GFM content [79].

Intellectual Property. There is increasing concern about the problematic widespread use of intellectual property available in the open knowledge web being absorbed into training data for AI GFMs such as ChatGPT or Midjourney without consent (e.g. [80, 81]). Lists of artist's digital work being used to train the Midjourney GFM have recently been published on the WWW, none of the artists had given consent or agreement for their work to be used [82]. Many of these artists are in legal disputes with Midjourney [83] and they or others may have begun to use pixel-protection mechanisms as preventive AI webscrape blocking measures [84]. Significant numbers of authors of written works, some very high profile, are also involved in legal action (e.g. [85]). As yet there are no clear solutions to this problem, however Lee et al. introduce us to the full complexity at hand [86].

6 A technosocial contract for civic learning

Epistemic rights have become a significant consideration in the debates around digital human rights to information. In a future-present postdigital conceptualisation, a CLN may form part of what Risse [8] suggests as a fourth generation human right for "epistemic rights in digital lifeworlds', and be a manifestation of a digital social contract.

[30] Fullfact: https://fullfact.org/toolkit/; https://fullfact.org/blog/2023/dec/how-to-spot-deepfakes/

Sometimes referred to as a technosocial contract - the digital social contract partially concerns the role of platform content and communication monopolies in society, that could be ethically and legally bound to act for the greater good [9]. D'Arma et al. [87] argue "it is not enough to speak about communication or digital rights. A more comprehensive term is needed to grasp the multifaceted challenges of the current situation to citizens, organisations, and democratic structures". They go on to make 'the claim of epistemic equality', that "in a functioning democracy, citizens should be equally capable of making informed choices about matters of societal importance. This claim includes the notion that citizens have equal access to all relevant information and knowledge necessary for informed *will formation*" ([87], author's own emphasis). We might consider that a CLN could provide a part of citizen 'equal access' to information and knowledge, to foster 'will formation' in a mutually shared ontological security for the uncertainty of the heterogeneous urban future-present city environment. D'Arma et al. [87] argue "there is a growing consensus about the necessity of epistemic rights. These rights are not only about the right to know but also … the right to have a voice and be heard". This indicates the value of considering the CLN as both knowledge and social interaction, equal parts of the knowledge web as a whole.

To support the future learning city, proprietary platform providers might be required as part of their technosocial contract obligation to invest in technical development initiatives to build and maintain app and platform interoperable, free and open civic learning networks, accessible by all. This might involve agreements for acting in regional digital sovereignty, in partnership with digital public good initiatives (e.g. various, in [3]). Additionally, data related territorial sovereignty legal obligations may mean that regional data-flow arrangements become mandatory, "as policies of data localisation" reshape "the architecture of connectivity" [88]. Perhaps data-flow territorial restrictions could act as further motivation for proprietary platform monopolies to act for the public good in regional context, though this seems an idealistic interpretation. Psaros claims that "(a)ll technologies, including digital ones, are considered to be deeply involved in the constitution of societies" [89], in this light the concept of data and information fiduciaries as public trustees as outlined in Napoli [90], appears relevant to the CLN. "In law a fiduciary is a person or business with an obligation to act in a trustworthy manner in the interest of another" [91, in 90]. An information fiduciary deals in information, with a duty of care and loyalty, to act in confidentiality and not do harm, and not disclose data to untrustworthy third parties [90]. Phillips & Mazzoli go further, describing a public service search engine, free of state intervention and 'commercial imperatives' [92]. Perhaps this, along with the interoperable connectivity with an open social web, might be how a CLN could provide equal access and voice to all citizens in their interactions with an urban knowledge web.

7 Conclusions

Contributing to civic quality of life, general ontological security, potential for democratic engagement and involvement, and the sense of value in contributions to knowledge are all reasons to consider the idea of a civic learning network. Whilst this paper has conceptualised a CLN in a context of an urban citizen digital lifeworld, CLNs could have a wider reach to become federated instances of a global network for learning. Though it may sound ambitious, impossible even, the message in the body of literature concerning future roles for digital platforms within society seems to imply we are on the edge of new ways to think about how technology meshes with human lives, and the purposes of what it can achieve. A CLN is a practical vision of a decentralised, potentially citizen-owned, Fediverse inspired model for civic learning technical infrastructure, providing access to open knowledge and opportunity for citizen contributions in a democratic inclusive smarter learning at the scale of the city. Perhaps this should be a prime goal of technological implementations in smart learning cities, and if citizen-led or owned is a technosocial critical pedagogy for lifelong learning.

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