Abstract

Communities of professionals work in a world saturated with information and subject to constant change. They need reliable training, updating and education. This may be based on established, stable and authoritative sources, or they may have to develop it themselves as situations and circumstances evolve. They may learn with conventional educational and training technologies, but most people are familiar with a range of popular social media. This chapter explains how the familiarity with games, their rules and formats, can be incorporated and aligned with other innovative and emerging informal digital learning techniques and implemented on free and familiar systems in order to enable sustainable, flexible, responsive and collaborative digital learning communities.

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Introduction and Rationale

There are many ideas and techniques coming out of the informal, innovative and imaginative digital learning research communities in the Global North. They are not dependent on sophisticated technology or infrastructure; they enable communities, of engineers or of farmers, to own their own learning, to make it and control it, and thus preserve and enhance their own culture, language and traditions whilst accessing the learning resources, meaning the learning content, the learning communities and the learning tools, from outside their communities, perhaps linking to similar communities, perhaps linking the global knowledge economy and the information superhighway. Five of these ideas or techniques are: mobile learning, really just learning with mobiles; e-moderating, building independent learner communities; curation, seeking, selecting, organizing and evaluating external, and perhaps internal, digital resources; heutagogy, supporting self-directed learning, independent of teachers, instructors or lecturers; and learner-generated content, encouraging learners to actively create their own resources, for the benefits of themselves and others in their community.

All these ideas or techniques empower and valorize learners, encouraging their agency and activity. In a world where information, ideas and opinions emerge rapidly and change rapidly, where there is perhaps no stable or authoritative canon or source for much essential learning, it is important for communities of learners to be able to evaluate resources amongst
themselves, to develop their own judgments. This involves developing the mechanisms by which learners can not only critique and review the resources created by others in their community but crucially can critique and review the reviews of others and understand the strengths and weaknesses, the likes and dislikes, of the learners in their community, enabling the growth of a self-critical community of learners. This is where we need to exploit the mechanics of games, those functionalities, such as points, badges, levels, leader boards, etc., that allow users to compete, compare and collaborate; sometimes called *gamification*. This can be combined with the stars, likes and reviews more commonly associated with online retailing, for example Goodreads, iTunes and Amazon, to give systems that allow learners to be more resilient, collaborative, creative, active, critical and autonomous. This is now increasingly called, in an academic context, *altmetrics* and is linked with the rise of social reading. It is a parallel development to tagging, *folksonomies* and *social book-marking*, typified by Diigo (www.diigo.com or Delicious.com, currently inactive), in these respects and offers interesting synergies. This chapter develops the case for this informal digital learning incorporating game mechanics with examples, technologies, pedagogies and resources.

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### The Pedagogies

This is true of the ideas we describe here. Many professional and community groups, and communities of practice ([Buysse et al. 2003](#)), do not usually have access to either the finance or the technical expertise and might have other, more pressing priorities.
A starting position is that learning within communities is more meaningful and more useful if the technologies and pedagogies are both aligned to the experiences and expectations of the community, rather than imposed from outside, and that they can be owned, managed and controlled by the community. This means starting with styles of teaching and learning that the community and their culture are familiar with and starting with technologies that are equally familiar, freely available and capable of delivering these styles of teaching and learning. There are now an enormous variety of Web 2.0 tools and technologies, ones that change the web from its original hierarchic top-down mode where the majority consumed what a small minority produced to a flat peer-to-peer mode where everyone consumes what everyone produces (Hage & Aïmeur 2008; De Wever et al. 2007). Social media, wikis, file-sharing and blogs are some of the archetypes, and Twitter, Facebook, Wikipedia, Flickr, YouTube and WordPress are some of the best-known exemplars.

The purpose is to explore how these can be exploited and integrated in order to facilitate the ideas and techniques of informal, innovative and imaginative digital learning. This is clearly a design process and, to be true to the rhetoric, must be a collaborative and participative design process, appropriate to each different community. This design process must however take place within a clear understanding of what is possible, the extent of the design space. The community can then proceed to explore designs within these possibilities. The community must develop processes that incorporate multiple voices and growing familiarity with proposals and prototypes. These proposals and prototypes can be expressed as low-fidelity, just sketches on paper, or high-fidelity, actual layouts on a familiar system like Facebook or WordPress (Sefelin et al. 2003); and some process like think aloud (Donker & Markopoulou 2002), where communities enact typical tasks with alternative prototypes, even a paper one, to see which works best for them. This may sound overly complex or technical but might in practice be almost an informal group game based around typical tasks, like adding an image and comments from a user’s mobile phone to the proposed system, using pictures or sketches of the various screens, to capture and test the necessary sequence of actions. Do they seem obvious, easy and safe? What
improvements are needed? A starting point for these prototypes is to look at how diverse special interest groups in Facebook use their respective spaces. How broad, narrow, clear or vague are their topics? How are behavior and contributions managed, moderated and enforced? How are media and comments introduced, used and shared? How has the Group developed, and what does the history reveal?

In terms of identifying the design space, meaning all the options and freedoms available to the community, all the constraints and limitations like finance, expertise, infrastructure and technology, but also the culture, language, traditions, experience and expectations of individuals and communities, must be taken into account. Technology constraints embrace both hardware and software, and so any system developed must match the ownership of, the availability of and the access to mobile phones, cybercafes, public libraries, school and college computer labs and perhaps individual, communal and institutional radio and television facilities.

Every community, in its culture and its environment, infrastructure, livelihoods, learning styles, habits and preferences, and capability, is unique and different. These too all are part of the design space, and part of the early scoping is understanding the impact of these constraints on what is possible. It requires ways of managing and sustaining the development and the outcome that are highly specific to each culture and community.

One can identify four ideas or techniques, before considering how they fit together and addressing the role of game mechanics:

Curation is the process of searching for content, which could be text, audio, video or images available as podcasts, websites, downloads, groups or blogs (Mihailidis & Cohen 2013) or for communities, which could be groups on social media such as Facebook, specific defining hashtags on Twitter or listservs/mail-bases, in fact anything allowing people to exchange and discuss, or finally, for tools. This process allows communities to develop the shared expertise to find, assemble and evaluate what they need to help them understand the lives and livelihoods they lead and the lives and livelihoods they wish to build. The livelihoods may indeed be formal professional livelihoods, or they may be subsistence farming, but every one inhabits several
different worlds or roles, and these ideas are adaptable to all of them but differently, and perhaps with greater or lesser breadth or sophistication in the tools that they select.

Curation has several indirect educational benefits, on top of the actual subject material or discussion being studied. It encourages learners to think about how they learn best – for example, is it from absorbing content or having a discussion, or from using a tool? It also encourages making and articulating key arguments to the discourse – is this any good, is this any better? It encourages classification and organization – how would one describe resources, what metadata describes such resources, what folksonomy works best for a given community’s quests?

Folksonomies might in fact be a better representation of a culture’s knowledge than externally imposed classifications (Gupta et al. 2010). So, for example, a community’s understanding of the relationships amongst local plants might be more useful to them than that of Linnaeus but might also be a chance for learning, sharing and teaching within a community and might thus tie into the various concepts of game mechanics, giving status and reward not only for generating or discovering knowledge but also for organizing it. “Culture” is here a broad term and refers to organizational, community, professional or office culture, sometimes defined as “the way we do things around here.”

e-Moderating, the tactics developed and designed to transform communities of online learners, is dependent on a teacher or tutor to a community of learners that is self-supporting, self-managing and potentially self-sustaining, allowing the teacher or tutor to step back (Salmon 2003), merely intervening to review progress, set tasks and correct errors. This could be a role taken by a knowledgeable community member, adaptable to mobile formats (Bren 2011).

Mobile learning is not specifically in the current sense of small-scale, subsidized high-tech pilots (Traxler 2001; Kukulska-Hulme & Traxler 2005) but learning adapted and appropriate to societies characterized, each in their different ways, by massive movement and connection (Traxler 2018a). There are overlaps with both blended learning and with distance learning, but the emphasis in relation to all of these is on those aspects that encourage ownership and control within communities rather those that are either imposed or supplied externally. With
any kind of access, mobile or desktop, there is always an equity issue, ensuring that the most marginalized have the same educational experience as everyone else. With mobiles, this includes bandwidth, connectivity and costs (Traxler & Crompton 2020).

Learner-generated content, the practice of learners contributing their own material, be it text, images, video or audio, for other learners in their community, based on shared values and experiences (Dyson 2012). There is a resonance here with the worker-writer groups and community publishers of the adult literacy movement of the 1980s. Many of these groups and communities published the poems, narratives and autobiographies of their learners (Woodin 2006; Pollard 2012). These formats could align with cultures that learn from stories and with the ideas of digital storytelling (Robin 2006). There is also an alignment with both the learning involved in citizen science (Kullenberg & Kasperowski 2016) and the preservation and transmission of indigenous knowledge (Maasz et al. 2018).

Self-directed learning, sometimes called heutagogy (Blaschke 2012; McLoughlin & Lee 2010), is the principles and practices that enable learners to manage and control their own learning. There is a relationship between heutagogy and connectivism, the pedagogy associated with the early MOOCs (Massive Open Online Courses) that attempted to capitalize on the “wisdom of the crowd” (Conole 2014), on the capacity of large numbers of learners to contribute to an emergent course. There is also a relationship with micro-learning (Buchem & Flamelmann 2010). These ideas, and many of the others we mention, must be reconceptualized in the context of different target communities (Traxler 2018b; De Waard et al. 2012), perhaps characterized by very different levels of educational attainment, pedagogic traditions, access and infrastructure from those where these ideas originated.

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Fitting in Game Mechanics

So how do all these parts fit together, and how do game mechanics fit in? In practice, many of these ideas overlap and are simpler than they sound as theory. The starting point is understanding
the needs and aspirations of any given community or organization and its culture. Whilst perhaps this is obvious, given our advocacy of learner autonomy and agency, it is still problematic. This understanding is the understanding of peoples and communities very different from the mainstream of globalized education and training systems, and the research methods we habitually adopt to do such research come with the baggage of their western, European, institutional and globalized origins. Efforts to “decolonize” research methods are only in their infancy (Prior 2007; Barnes 2018) and are obviously very culturally specific, as well as constrained by issues of infrastructure and capacity. In fact, “decolonize” might be too narrow a term, since there is clearly a need to develop community digital learning for communities outside the conventional decolonization movement, indigenous peoples, nomads and travelers, for example. The slogans should be: just because it worked for us doesn’t mean it’ll work for them; and just because it worked for some of them doesn’t mean it’ll work for the rest of them. And they may be a community of farmers or a community of agricultural engineers.

The same principles and remarks apply to the actual design processes involved in adapting the pedagogic ideas, finding the tools that deliver them and integrating them into an informal digital learning space. There are, however, already some examples of collaboratively working with communities on the development of apps so these can be adapted though again these are culturally specific.

There is a vast variety of resources online, some good, some bad, some established, some emergent, some permanent, some transient. In order to exploit all these resources available online safely and effectively, learners in communities need to develop their own critical skills and appreciate the critical skills of their fellow learners, so that as resources are curated into the community or generated within the community, everyone can understand the relative values of the resources being shared for learning. So, if one is looking for how best to support this novel kind of digital learning, the answer is clearly not the conventional input of technology, systems and content but scaffolding and capacity building amongst communities not on to them, perhaps
building on Heeks notion of ICT4D 2.0 ([2009]: 13), making the transition along “laboratory (pro-poor), collaborative (para-poor), and grassroots (per-poor).”

Everyone is familiar with the peer-reviewing systems of YouTube, Amazon and Goodreads, where in slightly different ways users can rate and review the respective resources but more importantly, everyone can look across for other reviews from the same reviewers and in essence can calibrate these other reviewers in the system; are they harsh, generous, cynical, naive, sophisticated, impartial or what? Likewise, many may be familiar with game mechanics being imported in learning apps, for example Duolingo (or Zikamob, described in Box 10.4), where learners or teams of learners can collaborate, cooperate and compete.

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**The Tools**

Within some system that acts as a portal, for example a Facebook group or a WordPress site, tying all the other tools or systems together, provides a stepping-off point or point of entry; WordPress is a typical example, but Facebook would undoubtedly work as would agile project management tools such as Trello or Basecamp.

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**Box 10.1 Indicative List of Tools**

- Tools for hosting communities, content, resources and profiles, acting as landing pages or portals to other tools: Facebook Groups or WordPress, etc.
- Tools for different kinds of content: Google Docs, SlideShare, Dropbox, Flickr, YouTube, Panopto, etc.
- Tools for curating both external and local content: Scoop.It, Flipboard, Pulse, Evernote, Pinterest, Google Currents, Diigo, etc.
- Tools for connecting learners and content: Google Hangouts, Twitter, Skype, Adobe Connect, Slack, Basecamp, Gmail, etc.
• Tools for finding content: Google, Bing, DuckDuckGo, etc.
• Tools for online quizzes/discussions: Kahoot, Padlet, Survey Monkey, Socrative, etc.
• Tools for content creation: Prezi, QuickOffice, Kingsoft Office, Sliderocket, etc.
• Tools for helping learners to schedule and prioritize their learning: Trello
• Tools for coordinating tasks and discussions: Doodle and Eventbrite
• Tools for brainstorming learning tasks and activities: SimpleMind+

The underlying philosophy is to leverage free or open systems to provide the interlocking functionality for any given community’s needs and to tap into its existing familiarity and experience with the chosen tools. In the case of game mechanics, this can be a challenge, and we must be a little more imaginative. The current candidates include the appropriation of free systems used to review submissions for academic conferences such as CMT from Microsoft or the open EasyChair with suitable setup configuration. There is ongoing development, and some reviews ([Lameras et al. 2017; Kusuma et al. 2018; Seaborn & Fels 2015]) provide systematic frameworks linking learning and game attributes, outcomes, feedback and roles, including the kinds of levels and roles we describe here. Other work is proceeding that may inform the eventual development of free or open systems ([Callaghan et al. 2014; Chorney 2012; Kim 2017]), and there are frequent references to specialist and bespoke systems in formal academia ([Gehringer et al. 2010; Luxton-Reilly 2009]). A complementary research direction might be the inclusion of recommender functionality, especially those aware of context and perhaps mobile ([Adomavicius & Tuzhilin 2011]).

Three Examples
Boxes 10.2 through 10.4 provide three examples of tools at the forefront of applying game mechanics for digital learning.

**Box 10.2 EAGLE**

EAGLE, an EU FP7 project developing informal mobile digital learning for rural local government, provides a recent case study (Stoffregen et al. 2016). The work of the local government officials across Europe draws on those areas of knowledge where there are established and authoritative sources and those where knowledge is emerging and contingent. Highway engineers encountering previously unseen types of flaw or fault in highway surfaces and local officials across different countries faced with an influx of undocumented refugees are two examples of the latter addressed in the project. The point is that in both cases, there was no authoritative or established answers or solutions, and so game mechanics created a framework that enabled emergent expertise to be recognized as the officials reviewed each other’s inputs (www.eagle-learning.eu).

**Box 10.3 BioVision**

Exploratory work with the Swiss charity BioVision (www.infonet-biovision.org) promoting sustainable organic farming in Kenya provides a similar contrast between the knowledge codified by scientists in Switzerland and the tacit or community knowledge amongst farmers in their respective village communities when faced with crop pests. Again, there was a need to reconcile and review external and local knowledge and thus use the levels, badges (Ahn et al. 2014) and missions of game mechanics to express the competence and contributions from within the communities (Vallauri 2015).

**Box 10.4 Zikamob**

Zikamob (Mangueira et al. 2019) was the name given to the mobile game app developed by a team, including the current author, with colleagues in northeastern Brazil, to change family behavior around domestic practices in order to reduce mosquito infestation and thus reduce the incidence of the disease Zika. School students and their competing schools had “missions” that
generated points and competed in leagues against each other and against other local schools, in order to gain badges and progress up leaderboards and league tables. The initiative was wildly successful and regular provincial surveys of mosquito infestation corroborated and correlated with game activity (www.uepb.edu.br/projeto-zikamob-entrega-premiacao-a-alunos-vencedores-da-gincana-de-prevencao-das-arboviros/).

Wrapping Up

These approaches are perhaps the antithesis of much so-called EdTech. The latter has focused on formal learning based in institutions and ministries, governed by curricular managed by professionals and oriented towards qualifications.

It has been delivered on dedicated and sophisticated (and costly) platforms with specific (mostly Western) pedagogic perspectives built in. The virtues, perhaps, are scale, cost-effectiveness, control and consistency, essentially industrializing the established processes of institutional learning, or rather institutional teaching. One here is advocating an alternative mode of learning, one that can exploit a host of widely known, free and familiar systems and technologies, that can be adapted, integrated and managed around communities of learners – rather than by professionals, and corporations outside and overpowering these communities. Game mechanics are one possible component of this alternative mode of learning, one that can be tuned to the culture and traditions of a community, maybe competitive, maybe collaborative, maybe a central focus, maybe a background option.

Ideas to Take Forward

The ideas and examples in this chapter are flexible and adaptable; they build on the existing tools, expectations and experiences amongst people about how they connect and communicate,
and on knowledge and ideas both inside the communities and outside in the wider world. The ideas themselves are speculative and thus require imagination and investment. Game mechanics are part of the digital experiences of many people but here adapted to giving communities of learners greater cohesion, resilience and openness. One might argue that these ideas and tools, individually or collectively, are especially important during the current COVID-19 crisis since they represent a framework capable of assimilating and structuring emerging knowledge and developing expertise.

References


