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DeMOOCing society: Convivial tools to systems and back again in the information age

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ABSTRACT

Since early development of information technologies, in particular computers and the Internet, there has been tension between those who believe these new technologies and their applications they have been mired in tension. Originally conceived and developed as tools for enabling high level, nonhierarchal engagement in problem-solving and development of information sources they have more recently been appropriated by those who believe the new technologies are best used for creating expert driven systems that guide users in obtaining important outcomes. One of the most eloquent social/educational theorists in recognizing this tension was Ivan Illich. Some of the most important early pioneers in computing technology were influenced by Illich's writings on tools conviviality, while many of the networking researchers were highly sympathetic to his ideas. In spite of this the idea of development of closed networks gained traction in popular culture, including in education. Many Internet-based education interventions, for instance, focus on creating directive systems that mimic traditional educational tools and goals in guiding students and/or teachers. One of the most important things education can do is teach students to reclaim conviviality of new information tools, especially applications focusing on engagement that have emerged in the last decade.

Introduction

Ivan Illich's thinking about the burgeoning information revolution changed in dramatic fashion over that last three decades of his life. In the 1970s Illich saw the computer, and what he came to call new electronic devices, as tools with potential for helping to, in his famous phrasing, deschool society, overriding the rigidity of socially embedded schooling where learning is designed primarily to meet the need of the dominant social group. He saw the (early) computer as a tool that could be used for agency, creativity and joyous connection (i.e. conviviality). In the 1980s, Illich became less sanguine about the purposes for which electronic devices might be used: fearful that the new ecologies created by these devices might be appropriated by more powerful forces and pushed away from their potential for creating a new type of education that challenged traditional schooling. Digitally developed ecologies could very easily fall into the same social traps as earlier technologies, dominated by small, powerful groups that control resources, setting agendas for those who became dependent on them. The potential for these new electronic devices to extend the reach of those who controlled them made the dangers of

appropriation that much more salient. As Illich entered the last decade of his life he began to see an increasing array of centralized applications and platforms as posing an existential threat to the human condition.

MOOC in this article is used as a concrete manifestation of the types of closed system that Illich feared—a new and greater threat to learning and society's control over what we know and how we know it than even traditional, ritualized, place base school systems. This article is not meant to be a diatribe against the use of technology in education—but a repositioning of perspectives on the relationships between computer/networking applications, technological systems, and education. Educators and learners, engaged and working towards transparent purposes, are in position to reclaim the possibilities of information technologies by relearning them as tools for conviviality, functioning outside of managed systems rather than subject to them: by deMOOCing society.

Illich's evolution of thinking about technologies and society

In his early writings Illich saw the potential in the new technologies (involving computers and networking) as tools for conviviality. His thinking was similar to, and possibly influenced by, some of earliest pioneers of what we have come to call information technology.[1] But Illich began to see dangers as these new devices started to penetrate and take hold in the larger society. Originally the development of networking tools was relatively subversive (Barlow, 2005; Turner, 2010), developed primarily to create new, open spaces for connection and engagement in critical and immediate problem solving (with the technology secondary to the specific problem set). The nascent information technologies that led to the creation of the Internet were meant to keep small groups of scientists/researchers engaged and connected. As these new technologies became more popular and accessible they began expanding out to larger populations of users. The new electronic devices came to be seen more as products than process. Their application in social discourse became less about idea creation and shared problem solving and more about being able to influence, and in some cases actually determine behavioral and thinking trajectories.

Illich recognized these new centralized, opaque uses of the quickly proliferating electronic devices as dangers that must be attended to if computer/networking technologies were going to fulfill their promise as tools for conviviality. There needed to be development of some type of organic governance before the potential of the technologies to challenge the status quo slipped away. Illich's worries about the direction of the new electronic devices coincided with a similar conflicts occurring within the computer and networking communities of the time. Conflict between those who looked to keep the new technologies and tools in the service of democratic, grass roots decision making and governance, and those who saw the new technologies themselves as the solution in and of themselves. Later Illich would suggest that the new information tools, convivial or otherwise, were becoming lost in an epoch of systems; we were giving ourselves up to controlled networks created separate from our individual issues and problems but designed to direct our activities in solving them just the same. The systems approach that Illich feared has, I would argue, dominated the ways the Internet have been integrated in to society in general and education in particular over the last decade or more.

In spite of, or maybe because of, this centralization, some newly evolving Internet applications involving creation of new spaces for communication (wikis) and activity (virtual worlds) have emerged as viable platforms and applications with potentials for creating spaces of silence with new approaches to learning. Open (cyber)spaces of learning that challenge the status quo more than even Illich might have recognized almost half a century ago. The major difference with Illich's thinking on technologies, techniques and systems presented in this article is recognition of the potentials for electronic devices recapturing their original identities as tools for

conviviality. Not through society's creation of laws and rules to protect the commons (which usually benefits society more than individual users or user communities), but in creating a generation of learners who develop capabilities (literacy, intelligence, efficacy) to use these applications/platforms: a bottom up reclaiming of computer and networking technologies.

Convivial tools and their relationships to education

Tools for Conviviality focused on the idea that open tools are created and developed locally, as a form of problem solving, over time by users; initially for egalitarian (joyous) engagement (problem solving and engagement are critical co-components of any successful tools). One of Illich's most striking examples of tools developed for conviviality is a technology that, like schools, have been so deeply integrated into larger social systems that we often do not or are incapable of thinking about as a participant driven, local technological innovation—roads. While it was true that roads brought distant populations together in different ways, these defined thoroughfares initially were designed, built by and ultimately belonged to the users and served the purpose of whatever the users needed at the time. Open tools for connection, used for communication purposes, increasing abilities of families to visit each other, or even building fruit stands on the roadside for passers-by as a form of commerce. When larger social institutions claimed ownership of roads, they did so as a means of control, creating strict boundaries on where they could go, who could use them and what people could use them for (e.g. war, commerce, control of movement).

The promise Illich saw in early information technologies as convivial tools for learning

Illich starts chapter six of *Deschooling Society* by proposing what he refers to as learning networks. However, in a telling few paragraphs he explains why he wants to replace the word networks with webs, specifically what he refers to as learning webs. What becomes apparent as Illich lays out his argument is that he is using language and concepts that are very similar to ideas that were primary motivations for the early development of Internet applications (and perhaps to a lesser extent the personal computer). These were ideas shared by Bob Taylor who first had the idea of connecting computers, J.C.R. Licklider a powerful guiding force in early digital technologies, and Douglas Engelbart at the Augmentation Research Center (Glassman, 2012). The idea of webs of thinking had first been raised by Vannevar Bush in his ground breaking article *As We May Think* (1945) which served as inspiration for the development of links and hyperlinks, windows, and applications enabling the type of open, nonhierarchical sharing of thinking and ideas that Illich promotes as a new context for learner driven educational processes.

Illich refers to four (types of) educational networks: (1) reference services for educational objects that can be used by students; (2) skill exchanges; (3) peer-matching; and (4) reference services to educators at large. The first and fourth, reference services, predict (almost precisely) the idea of object oriented Open Educational Resources (Glassman, 2016). Illich outlines a network of open resources that can be accessed independently of any institutional oversight and used as "learning objects" (Illich actually uses this term which would become critical to OER three decades later). Learning objects that can be accessed by students as part of their educational processes (network 1) or by teachers/facilitators in helping students learn (network 4). How Illich was able to predict OER in 1971 is a subject for another article.

Of primary interest for this article is Illich's third network. He suggests that students should be able to find peers who are interested in the same ideas/tasks/problems they are looking to pursue, so they could create organic, nonhierarchical working groups for developing their ideas and their skills. Illich describes network 3 as a communicative network, suggesting computers as

a new tool that can put like-minded individuals in touch with each other for exchanging and refining their own ideas (again foreshadowing the information/communication debate that has haunted the Internet[2]). Illich also mentions using bulletin boards (though not the online type) as a tool for bringing individuals together to work on problem sets. Combining the concept of bulletin boards with computers would lead to one of the major breakthroughs in the use of networked computers for the creation of the types communities Illich envisions through network 3 just a few years later (Abbate, 2000). In essence, Illich was making the same argument about networking that Vannevar Bush was in his foretelling of the Internet. Except Illich's vision prioritized communication (partially synchronous development of ideas) rather than information. His framework replaces scientists with students, democratizing the application of networked learning (the idea of a public network like the one Illich envisions was decades away from even being considered). He was also suggesting that these networks could have a positive effect on the human condition. Illich might have even been thinking of the networked computer as an optimum tool for conviviality—individual students making connections to individual students outside of the control or even purview of school ritual; open exploration replacing tests and articles.

An important component for students being able to use this type of networking in their educative processes is having a deep understanding of the intricate connections between users it enables. Illich's larger framework suggests that computers (and be extension digital applications) should not be black boxes whose attributes are controlled by a coterie of experts. Using digital technologies/devices as convivial tools requires a true understanding of underlying concepts and materials (later a core value of the Open Source movement (Glassman, 2013).

When danger lurks in technology: Silence as a commons we must protect

It is commonly believed that in the late 1970s and early 1980s Illich made a turn in his thinking about technology (including computers and other electronic devices) and networks (which were becoming more common among users). That he no longer considered technology as creating webs of opportunity for learners, the proverbial anti-school—but as vehicles for centralized control. While it is true Illich suggested human should be aware and vigilant about the proliferation of electronic communication devices (long before texting or Facebook), his argument about how we should treat their increased presence in our lives is a good deal more subtle and reflects tensions in the computer/networking community at the time (Turner, 2010). Illich outlines the dangers and how he thought they might be ameliorated in his article *Silence is a Commons* (1983). Illich's primary concerns revolve around the use of electronic devices to recreate communications as resources rather than as opportunities for shared commons (where a network of learning could flourish). When Illich talks about commons he is referring to a shared communicative place/space where individuals could learn to subsist together, with each other, based on unwritten social agreements that develop organically over time. The commons as an open arena for teaching and learning. Silence offers the opportunity to use these new commons for convivial engagement. A cycle emerges where organically derived "traditions" emerge as shared, unwritten governance structures passed down between generations (with generations in the digital world turning over much more quickly than in the physical world).

Illich compares these potential communicative commons to the pre-industrial place based commons, shared spaces (e.g. the town square) where individuals have equal, unspoken rights based on strong ties to local culture and traditions (Illich had traditionalist tendencies believing that it was these unwritten rules developed over time, naturally brought order to a chaotic world. The concept of 'disruption' as a good thing would probably have been anathema to Illich). Illich made the argument that these traditional commons had been encroached upon and then destroyed by small, powerful groups who looked to control them as limited resources. Those who controlled these newly defined resources would eventually move to determine how

and why to distribute them. Individuals and small groups worked to fence the commons off so they were no longer shared, open spaces but resources for predetermined purposes that fit their larger agendas. Human activity turned learning how to purposefully engage at a local level to meet transparent goals and through this engagement live as members of a shared community (subsistence) to being passive consumers of resources. The owners of these resources increased their control over individuals by creating the illusion of scarcity (Illich was actually working on a book about the impact of scarcity on human behavior at the time, which he never finished). While this idea of commons turned to controlled resources seems simplistic, Illich was using it primarily as a metaphor for his growing fears of the impact control of space as limited resources would have on human behavior.

The four networks in chapter six of *Deschooling Society* offer spaces of silence as commons where individuals can participate according to their own needs and work with others in solving immediate problems. Silence maintained through unwritten traditions for the common good built up over time through shared activity. The rise of corporate interests looking to control and even dominate these shared spaces put organic activities for intellectual and emotional subsistence at risk. If corporations and/or governments were able to assert control of these electronic spaces, close them off, treat them as limited resources, they could fill them with their own communicative acts that drowned out the silence; open, multi-lateral engagement would be replaced by whatever those controlling the space wished to communicate, or were paid to communicate.

In his silence is a commons period Illich does not seem to have given up on using networks as important tools in establishing learning webs—although he does not speak of education specifically in the article. He also realizes that electronic devices were turning networks in to manipulative tools capable by supplanting authentic dialogues with cacophonies of information—a constant stream of what you must learn, know and do in successfully using the space. Illich offers an illustrative example describing the experience of his grandfather who lived on an island where inhabitants were more or less equal in their abilities to communicate with each other in the common square, following traditions of engagement developed over centuries. One day the first loudspeaker arrived on the island (a disruption) and those with access to its microphone began to override the traditions of the commons. Whoever controlled the microphone controlled discourse and if there was only one microphone (scarcity) that person had great power in determining the agenda for the entire population.

It is possible to apply Illich's point, at least partially, to what occurred in the 2016 election in the United States. Initially online communities were made up of a variety of bulletin boards that served as empty spaces for the transparent purposes of their users. These early online communities could hijacked by different agendas but, for the most part, they helped create distributed networks of users where different ideas competed in an open space (Eric Raymond's famous metaphor of a Bazaar, 1999). The 2016 elections saw extensive hijacking of these networks take place in plain sight. The more successful of these commons naturally evolve their own "traditions" of use (e.g. Linux, Apache, Glassman, 2013) As well funded platforms dominated by small investor groups began to emerge the control of communication became more opaque and more under the auspices of a single source, an artificially imposed centralized network. Users are provided with information without knowing why. Individuals became more consumers on, than users of, the Internet. In one example, Facebook owned/controlled the microphone for the users/consumers on their site. They were able to determine the agenda for a great many Facebook users without them even being aware that this was happening (This is not to say Facebook is the only platform to do this. As Illich predicted almost every privately held platform engages in this type of control activity to some extent).

Illich does not present these ideas to say we should abandon the expansive use of electronic devices, but to argue we must all work together to create some type of shared governance for the emerging commons; a governance that is not imposed but evolves through engagement (as, for example, with Linux and Apache). We needed to develop traditions of use so that the

equivalent of cyber "lords" (Illich did not use the prefix cyber but I believe this is where he was going) could not enclose these spaces (in communicative terms dominate them) so that they served the market interests of those controlling the proverbial "microphone." Illich was not denying the potential social benefits of the new electronic devices (as much as he was a traditionalist)—he had extolled their possibilities just a few years earlier. He was instead looking for ways for these new open spaces to be governed by the people who use them so that they did not become dominated by those who might claim them as productive resources—which could be bought and sold at the whim of their owners.

The epoch of systems and the influence of cybernetics

The evolution of Illich's thinking on network systems, and the importance of transparency and user ownership continued through the eighties and nineties. As the millennium drew to a close, Illich became fatalistic about the domination of what we have come to call "Big Tech," creating closed systems and ushering in a new epoch of control in human activity. In the first epoch the human was the tool – there was no separation between human engagement in the world and the methods they used to extend that engagement. The second epoch began in the twelfth century when human work was divided between purposeful activity and the tools used to achieve those purposes. The tool exists even when the individual is not using it. This is fine as long as individuals understood the tools as their own, and were able to use them in ways that directly met their needs in transparent fashion. The divergence of knowledge of how to use tools and actual tool use created a new power relationship in human activity. Those who are able to lay claim to knowledge of the "right way" to use tools are given unequal (and unearned) power in determining behavioral trajectories (Dewey, 1925 makes almost exactly the same argument according to the same timeline in *Experience and Nature*). Those who are able to claim ownership over tools can create rituals of use that make it difficult if not impossible to think of them in different ways.

In *Silence is a Commons* Illich suggests that electronic devices for all their potential could, if appropriated by groups, create even a greater threat to human agency and relationships than manipulative tools. The key to keeping the electronic devices as tools for conviviality was to make sure they engendered autonomous and creative intercourse among users. The traditions Illich implores users to develop were central for many of the early developers of electronic networks and computers (Glassman, 2013; Raymond, 1999). However, as the 1980s progressed, application of computers and networking seemed to move in a very different direction, even beyond what Illich referred to as manipulation. Creating enveloping systems where users become part of predetermined communication networks rather than simply manipulated by tools and their rituals. The users leave determination of process and goals of activities to the small group of experts who create the system(s) without even realizing they are giving up agency.

One of Illich's professed goals in writing *Tools for Conviviality* was so that humans could easily recognize when tools were being shaped by larger forces (corporate, industrial, governing) as manipulative—that humans would be able to understand and respond to the difference between technology and technique. If humans had abilities to recognize what was happening when others took control of our communicative/engagement spaces they might be able to find ways to push back. To maintain a sense of conviviality through tool use in spite of efforts by larger forces to enclose them for their own purposes (there is always the opportunity to put the microphone down). In the 1970s, Illich seemed to see the computer and the larger universe of electronic devices as an important test case. Especially networks/webs as tools for conviviality in a new type of educational experience(s). By the eighties and nineties the idea of computers as tools for conviviality faded. Leonard Kleinrock chaired the report *Toward a National Research Network* in 1988, depicting the Internet as primarily a closed system run by corporations. One of

the ironies is that this led policy makers to refer to the Internet as an information super highway—the same metaphor Illich used to describe the dangers state centralization posed to conviviality almost from the beginning of human tool development. The Internet became more a controlled resource (that could be used for business purposes) than an open commons. The emphasis was on information you could put out as product rather than the space for silence you could develop for outreach and creativity (e.g. Bill Gates famous dictum, "Content is King"). Computer hardware and programming became specialized and use of patent laws made it more and more difficult for individuals to see it as transparent and feel a sense of ownership.

The MOOC as metaphor for managed educational systems

The acronym MOOC generally stands for massive open online classrooms. There are actually two definitions of MOOCs: cMOOCs based on a connectivist approach (Milligan, Littlejohn, & Margaryan, 2013) which suggests that learning communities (might) develop organically through an open system of connections (links between nodes are not predetermined or guided but emerge naturally through processes of problem based exploration) can enhance learning. There is a good argument that these connectivist MOOCs can, but often don't, create the types of egalitarian, nonhierarchical online (learning) communities that promote user ownership (i.e. digital networks as tools for conviviality). Then there are the extended MOOCs, which use network systems to create/enhance closed, designer developed, centralized educational systems intended to increase individual knowledge acquisition (broadly defined). These xMOOCs in many ways reflect the types of managed, top down systems Illich feared, where a single or chosen group of individuals hold the (educational) microphone which learners follow and then forget how to challenge. Learning systems designed by small groups of experts prior to use. Systems that control discourse linking structures, usually from a central hub directly to surrounding individual nodes and back again by design.

Similar to the road networks constructed by earlier generations the pathways created by early Internet pioneers as tools for conviviality (e.g. bulletin boards Glassman, 2016, open program building communities, Raymond, 1999) have been commandeered by powerful members a networked society for the users' "own good." This can be done through algorithms (e.g. Facebook), market dominance (control of the microphone, e.g. Amazon), or linking structures (e.g. Coursera, edX). Those who look to control these spaces sometimes use the same message of scarcity that Illich identified as an excuse for manipulation. For instance one of the more influential white articles on xMOOCs (e.g. Hollands & Tirthali, 2014) focused primarily on cost of education. There are only limited chances for individuals and communities to improve their well-being through education and it is imperative that those who have knowledge be able to control its dissemination through Internet connections. What is often portrayed as the new information technologies' greatest strength, pathways for valuable knowledge to a larger population is within Illich's model an excuse for top down enclosure of the new spaces created by electronic devices.

The technologies are purposefully opaque with limited, high controlled use (iPads in the classroom). In many instances learners are not allowed, or even unaware, of pathways of communication and information other than those that have been designed for them. More important controlled spaces, like those create by xMOOCs are doing exactly what Illich feared and fought against in the often misunderstood *DeSchooling Society*; they not only support but inure users to the idea that there is "right" information, a "right" way to use the Internet. The Internet is an instrument of control by the few rather than open engagement by the many.

The idea of MOOCs, as used in this article, serves as a metaphor for the development and application of technologies that transforms cyberspace from spaces of silence (open knowledge sharing, problem solving communitiesautho) into (en)closed systems (through algorithms, linking structures) that controls the flow of information. In educational contexts tools created specifically

for conviviality (Illich's third network) are transformed into designed learning experiences with specific, pre-determined outcomes that meet the needs of the designers (often times for teaching specific skills). Instead of being active agents in an open and transparent systems, students/users are waiting for and responding to the enhanced "voice" of designers (and those who support them), whether through programmed feedback or through human feedback. The primary goal of these systems is not open ended conviviality but management of outcomes. Conviviality becomes secondary if it continues to exist at all (there are enclosed systems that include purportedly tools for conviviality, such as discussion boards, blogs or wikis, but almost always as addendums to the central purpose of the system). From Illich's perspective these type of attempts to recapture tools as creating convivial spaces will always remain subservient to the needs of the larger system—and indeed they are very often unsuccessful in recreating the types of engagement found in early digital networks, Glassman, 2016).

The learning webs that Illich describes in chapter six of *Deschooling Society* are a form of rebellion against the manipulative tools used in schooling. He saw them as expanding possibilities of engagement beyond the accepted rituals of the school, the accepted communication of the system. Knowledge of tool use becomes contested ground. It is doubtful Illich would have thought it even possible to recognize possibilities for rebellion against sponsored knowledge within managed, online (educational) systems. No matter how much you expand the scope of engagement out you are still working within, and for, the designed system. This, for Illich, is the most insidious aspect of control of Internet systems. They convince users that it is impossible to think outside the system.

Many current educationally oriented Internet applications are marketed as closed systems that can guide students/learners towards specific outcomes. These include, but are not limited to local online tutoring programs, the self-enclosed xMOOCs type courses described above, and online/distance education courses running through pre-packaged "learning management systems." The student is often integrated, as an individual learner, into larger systems created by small teams of educational designers completely separate and with limited knowledge of those their systems serve. Many times the learning systems recreate accepted rituals of the schooling experience—at least as Illich might define them—in online ecologies (e.g. tests, badges).

Returning information tools to their convivial origins where there is silence there is hope

In his last discussions on the human condition Illich became fatalistic (Cayley, 2005) about our technologically driven future. This may have had something to do with timing. Illich's final thoughts were at the turn of the millennium when the Internet was in a period where selling websites and one way, direct communication, treating users as consumers, dominated cyberspace. There were small pockets of users creating open communities of silence, building their own organic traditions of governance, through applications such as email and file transfer protocols to create open spaces of silence, but they were not well known and Illich may have been unaware of them. Over the last couple of decades however there has been a re-emergence of information applications that can serve as tools for conviviality—often times based on the original ideas of Bush, Engelbart and Nelson. Applications such as blogs, wikis, and multiuser virtual ecologies (e.g. Second Life) that can help establish common spaces of silence as we move through the 21st century.

A difficulty in re-energizing the spaces of silence where Illich saw so much potential is the continued dominance of closed learning systems. This problem can be especially acute in education (e.g. state based curricula and testing). Students, teachers and administrators can have a difficult time breaking away from online managed systems in particular, and educational institutional systems in general. Ironically one of the most likely avenues for reclaiming

information tools for conviviality are the same educational institutions Illich disparaged, in particular the traditional schools where learning is based on processes of engagement between teacher and student, students and students, and students and the society at large (see Hakkarainen & Paavola, 2009 for an example of this). I suggest a primary concern for educators as they integrate electronic devices more and more into classroom practices (whether they be ipads, smartphones, or ICTs) is consciously breaking away from and/or actively rebelling against prepackaged and/or predetermined systems and treat them as tools for conviviality [this is more of a Freire (1972) than Illich type solution]. Spaces where learners find Illich's third network and learn to engage with like-minded users to solve immediate and relevant problems. Creating unique communities that are transparent in that they develop their own practices (which can be explored at any time through online archives) and can act outside of established systems: schooling as an important step in the deMOOCing of society.

Recreating information devices, platforms and applications as convivial tools will require new approaches to the use of technology in education. One that focuses and builds up from classroom users vital experience, well versed in both education and technologies. A breaking down of the distinction between instructor, student, and technologist. In some ways, Dewey's democratic classroom (1916) can serve as the model for recapturing information technologies as convivial tools. The students and teachers eschew experts as they continuously reorganize their thinking about the roles their tools play in their activities, and how it changes them and the technologies in problem solving. Devices, applications and platforms naturally blend with educational processes where meaning is determined through the workings of a democratic learning community. These types of learning processes are already happening outside of formal educational settings: bulletin board/image board based platforms such as Reddit as its best (of course sites such as Reddit can also be problematic, suggesting education can play an important role). A bottom up, democratic approach has been difficult in classrooms to this point in part because many teachers can be intimidated by new technologies (Cuban, 2001). As a new generation of teachers and researchers emerges as comfortable with using information technologies (they have grown up with) as they are with central ideas of teaching and learning. It would mean changing the technology hierarchy found in many schools and universities so that there are no assigned "experts" on technology who determine policy and design. It would mean focusing on the development of Open Source platforms that adjust to problems as encountered. It would mean focusing on the convivial over the efficient.

Notes on contributor

Michael Glassman is Professor of Educational Studies at the Ohio State University. He has written extensively in educational theory and the emergence of the Internet as an educational tool. He is currently especially interested in bringing ideas of theorists such as John Dewey into our understandings of the Internet and the ways it is being integrate into educational and larger social systems.

Notes

1. Member of early information sciences were in residence at CIDOC, his institution of learning where he developed the ideas for deschooling society and tools for conviviality. Members of the Homebrew Computer Club, the intellectual and material incubator for much of the computer revolution were deeply influence by Illich's work (Turner, 2010).
2. Whether the Internet should be viewed as a tool for communication or a tool for information delivery is at the heart of ongoing debates on Net Neutrality. If we view the Internet as a communication tool then it can be regulated as a public good the same way other public communication systems are regulated. If we the Internet as an information tool then it becomes more of a private business where the commodity is not the Internet but the information provided. The communication/information debate extends into MOOCs and the thinking behind them. To say both is to avoid critical questions in how we envisage the Internet's footprint on society.

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