EDUCATIONAL THEORY

THE DIALECTICAL RELATIONSHIP BETWEEN PLACE AND SPACE IN EDUCATION: HOW THE INTERNET IS CHANGING OUR PERCEPTIONS OF TEACHING AND LEARNING

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Abstract. In this essay Michael Glassman and Jonathan Burbidge explore the idea of a dialectical relationship between the traditional place(s) of teaching/learning settings and the challenges to our perceptions created by the new spaces of the Internet. The authors examine this topic in the context of a three-stage evolution of humans' relationship with new technologies: (1) fear of how new technologies will change our everyday actions, (2) recognition of emerging technologies as tools capable of offering new possibilities in our activities, and (3) integration of new technologies into productive everyday activities. The Internet is moving quickly through all three stages, but this process takes different forms with disparate populations. What makes recognition of the fast-moving integration of Internet technology important in the field of education is that students and educators are often at different points in this process. It is critical that we are aware of the role technology is playing in the classroom, in particular the dynamic dialectical relationship between space and place.

The Internet is a continuously expanding phenomenon, in terms of its reach and its penetration into different societies and cultures, but perhaps especially in terms of how it affects human relationships. It is difficult to realize now, but the Internet has taken directions and created actions and trajectories that were mostly unanticipated even a decade ago. Future developments are unforeseen and unpredictable. There are two aspects of the Internet, as there are to any technological innovation.[1] First, there is the material aspect: the extraordinary development of the Internet's infrastructure, as well as the continuous flow of new applications, each one seeming to surpass the last in possibilities and increased user capabilities.[2] Second, there is the social aspect: the implications the Internet has for society — that is, the way it changes, sometimes permanently, how we relate to each other and to the world around us. This second aspect of the Internet is especially complex because it is one of the most intuitive technological innovations in human history and challenges many of our most basic assumptions about individual development and

1. The idea of a differentiation between technique and technology has been part of the ongoing discussion of the philosophy of technology almost since its inception. Michael Glassman, ''An Era of Webs: Technique, Technology and the New Cognitive (R)evolution,'' *New Ideas in Psychology* 30, no. 3 (2012): 308–318.

2. In his book *Tubes: A Journey to the Center of the Internet (*New York: Ecco Publishers, 2012), Andrew Blum documents the actual physical makeup of the Internet.

group dynamics, creating difficult problem sets that we put off or ignore at our own peril.[3] As John Dewey said almost a century ago, "We have displayed enough intelligence in the physical field to create the new and powerful instrument of science and technology. We have not as yet had enough intelligence to use this instrument deliberately and systematically to control its social operations and consequences."[4] The larger context of Dewey's remarks suggests that he was worried about using technology as a separate tool to control nature and bring about specifically designed outcomes. Rather, the goal should be to integrate these new technologies into everyday actions and relationships where they become part of what we do. Developing the type of intelligence Dewey discussed means moving from using technology as a predetermined problem solver to incorporating it as part of (scientific) problem solving based on some end-in-view.[5] Dewey offered this warning in an address long before the nuclear age, let alone the Internet, and yet as technological innovation progresses, it seems to be an increasingly prescient observation.

The key to understanding the ways the Internet impacts education is not found in exploring the implementation of the next application; by concentrating primarily on the instruments of technology, we risk stripping away its humanism.[6] Too often we make the choice of implementing technological innovation as a means to some predetermined end over exploring its impact on the human condition. The emergence of online charter schools and aggregated massive open online course sites (MOOCs) such as Coursera has the potential to be a powerful consequence of scientific innovation.[7] But, as Dewey suggested, without

3. The argument can be made that the Internet has made greater penetration in a shorter period of time than any other technology in human history. See Michael Glassman and Min Ju Kang, "Pragmatism, Connectionism and the Internet: A Mind's New Storm," *Computers in Human Behavior* 26, no. 6 (2010): 1412–1418.

4. John Dewey made this statement late in his career at a conference exploring the future of technology. John Dewey, "Science and Society" (1931), in *John Dewey: The Later Works, 1925–1953*, vol. 6, ed. Jo Ann Boydston (Carbondale: Southern Illinois University Press, 1973), 60.

5. John Dewey developed this conception of intelligence at least as early as 1916, in his book *Democracy in Education* (New York: Macmillan, 1916).

6. Richard Weaver makes this important point in his article "Humanism in an Age of Science," *Intercollegiate Review* 1–2 (Fall 1970).

7. Coursera is one of a number of new online college courses where professors from Stanford and other universities make their course work available online in an open-access environment. There is still an expectation that this work will be monetized in some way.

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developing the intelligence to understand the meanings of this rising technological phenomenon as a natural, integrated part of human activity, we risk ceding control of the Internet's relationship with education to small, entrenched populations attempting to control rather than expand possibilities.

This essay attempts to start developing the type of ''intelligence'' to which Dewey pointed. This is, perhaps, one of the most important tasks facing us as we struggle to comprehend information technologies even as they race ahead of our imaginations. It is, of course, a large and complex project that will challenge educators for decades, if not centuries, to come. The focus here is on a critical topic, what Manuel Castells and others have referred to as the dialectical relationship between place and space in the burgeoning computer age.[8] Castells is fearful of the impact of the Internet, and by extension the web, on human activity. Castells suggests that ''both space and time are being transformed'' by new information technologies, and, consequently, the ongoing processes of meaning making are dramatically altered.[9] Information now flows through electronic networks creating a space of flows that is ahistorical and lacking in any fundamental relationships to geographical place. Most people spend their lives and build their thinking about the world in places where meaning is cocreated over time and contained within physical boundaries. The fear is that if only a few individuals control the information movement inherent to the space of flows, it will dominate important aspects of human lives without the boundaries of shared history and meaning acting as fail-safes to outside control. The space of flow might overwhelm place, relegating it to secondary status in the development of knowledge and knowing within society.

The Space of Flows and the Space of Places

The dialectic we are suggesting in this essay is a variation on Manuel Castells ideas of the interacting ''space of flows'' and ''space of places.'' Castells conceptualizes space as ''time sharing of social practices,'' where individuals engage each other through social processes.[10] According to Castells, the Internet creates new potential for instant and synchronous interaction over considerable distances, necessitating revisions to the concept of space.[11] The Internet itself was originally envisioned as a time-sharing device based on flows of information between networked

8. Manual Castells, ''Information Technology, Globalization, and Social Development,'' UNRISD Discussion Paper No. 114, September 1999 (paper originally presented at the conference of the United Nations Research Institute for Social Development, Geneva, Switzerland, June 1998); http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.130.5730&rep=rep1&type=pdf. In this paper, Castells offers ideas that are more sociological and business-oriented in nature, focusing on the way the Internet might change production centers in unforeseen ways, but his thesis seems highly applicable to education. See also Roger S. Slack and Robin A. Williams, ''The Dialectics of Place and Space: On Community in the 'Information Age,''' *New Media and Society* 2, no. 3 (2000): 313–334.

9. Manuel Castells, *The Rise of the Network Society* (Oxford: Blackwell, 1997), 376.

10. Ibid., 441.

11. Manuel Castells, *The Informational City: Information Technology, Economic Restructuring, and the Urban-Regional Process* (Oxford: Blackwell Publishers, 1989).

nodes — flows of information that permit the sharing of meaning and experiences formerly restricted to individuals in a particular place.[12] The space of flows in the Internet age can be understood as the movement of information between distant networked nodes; it not only allows for instances of social practice, but also for the unhindered movement of information from, through, and to the increasing number of localities that form part of what Castells calls the ''global network.''[13]

In comparison, the space of place is wholly dependent on physical contiguity, and, as a result, information is restricted by boundaries that define those contiguities. One of the key differences we see between the space of flows and the space of places is that the former acts as a centrifugal force on the human mind, while the restrictions of place act as a centripetal force.[14] The space of flows made available through the Internet allows individuals to extend their thinking out into new realms, where it can come into contact with — and, in the best possible circumstances, cooperate with — the thinking of others. Place, we would argue, often acts as a historically and socioculturally derived centripetal force on human thinking, where the flow of information is restricted by the customs and belief systems woven into the bounded and contiguous relationships. Putting this idea in the context of education, we see the space of place as the classroom, with information carefully defined by the contiguous relationship between socially determined interlocutors and students. Relationships are bounded by customs and historically determined practices about what they mean, whether in an elementary school classroom in China, a college classroom in the United States, or a madrassa in Saudi Arabia.[15] The space of flows enables unrestricted experiences on an open and free Internet. For the sake of simplicity, in this essay we refer to the space of flows as ''space'' and the space of place as ''place.''

Castells suggests the importance of linking space to place in order to make sure that they do not become isolated from each other, with each grabbing their own knowledge and control. However this requires bridges of communication that recognize the importance and role of both in activity. MOOCs, for instance, can create knowledge systems that lack any type of connection to the geographical places where the people they reach live their lives. The knowledge provided by the MOOC is privileged but also ahistorical and lacking any connection to the vital experience of the learner.[16] At the same time individual classrooms may refuse to acknowledge, let alone connect with, the emerging space that may already be affecting students' knowledge systems and ways of knowing outside the classroom. This shrinks the scope of the educational experience even as

12. Glassman, ''An Era of Webs.''

13. Castells, *The Informational City*

14. Michael Glassman, ''Open Source Theory .01,'' *Theory and Psychology* 23, no. 5 (2013): 675–692.

15. The concept of place in education has been made far more complex by the introduction of mobile learning devices.

16. Dewey, *Democracy and Education*.

the accessible information universe becomes more interconnected, allowing the boundaries of place to become an intellectual/cultural prison.

The solution to the problem of a separation between place and an evolving space is for local place and global space to engage in a dialectical relationship, changing and informing each other through interconnected activity.[17] Because the web is primarily concerned with new types of sharing and uses of information, especially as a collaborative enterprise, one of the key contexts for integrating its applications into our lives should be the classroom and other formal as well as informal educational venues.

Educational settings offer, and may begin to force, explorations of and experiments with the interlocking dynamic relationships between the ways we perceive traditional places of education (for example, the classroom, the computer station) and the information-based electronic space of the Internet. It is a question of balance; embracing the dynamic information flow of the Internet has the potential to isolate place from space, but it also creates new opportunities for the development of collaborative projects for almost any activity or topic imaginable.

A Flashpoint in the Classroom: Who Is Kony?

The ongoing relationship between space and place might best be illustrated by an interesting, Internet-directed educational incident in a college class. It started at the dinner table of the teacher of the class. His daughter asked him, seemingly out of nowhere, what he thought about Joseph Kony, the leader of a Ugandan resistance group that had kidnapped children and turned them into child soldiers. The question was a moral question of whether the United States should send its military to Uganda to hunt down Kony and bring him to justice. The idea of the Invisible Children Foundation was brought up, but only tangentially. It was only after the conversation was over that the teacher began to wonder why his daughter had brought up Kony at all, assuming it had something to do with a lesson at her school. When he logged on to the course blog, he found two posts on Kony and the plight of child soldiers from that day.[18] Among the posts there was some discussion about Invisible Children and the responsibility of individuals to combat the problem of child soldiers. At first the teacher was stunned by the coincidence, but he soon saw a link in one of the posts to a YouTube video that was in the process of going viral.[19] The video was well produced and dealt with the subject of Kony and the plight of the child soldiers. The teacher realized that his child's interest had probably not been spurred by anything at school but rather by this video.

The college class met the next day, and, based on the teacher's discussion with his daughter and activity on the blog, he decided to change the topic of

17. Slack and Williams, "The Dialectics of Place and Space."

18. The course was designed as a hybrid course that uses a community blog for communication, discussion, and assignments.

19. "Kony 2012," YouTube video, 29:59, posted by Invisible Children, March 5, 2012, http://www.youtube.com/watch?v=Y4MnpzG5Sqc.

the class that day to children and violence. During the following days, students were accessing the class blog and linking to articles on Kony and child soldiers. An effective video on YouTube had affected the blog and then the trajectory of the class, but at this point the Internet was still being used primarily as a tool to enhance what was happening in the classroom. Before the next class meeting, one of the students who had not attended the previous session, and who was an infrequent poster on the blog, entered a long, intricate, passionate, and extremely well-written post on the issue of Kony, Invisible Children, and the viral video. He explained how he had been deeply involved in this issue for almost a decade and believed that there was no longer a child soldier issue in Uganda. He reported that Kony had fled Uganda, was living in the jungle, and was no longer in the minds of the Ugandan people. The poster commented that child soldiers had not been a problem in Uganda for a number of years and current efforts regarding this issue focused on getting these former child soldiers, now adults, acclimated back into everyday living. He stated that resources are now needed in programs that deal with the reintegration of former child soldiers. The poster went on to say that he believed that the video, rather than bringing attention to Kony and the child soldier issue, was more of a fundraising tool for the Invisible Children Foundation.

That evening at dinner, the teacher asked his daughter about the video and the idea that Kony was no longer a serious issue; she mentioned that she had read some posts online saying much the same thing. On the class blog there were a number of responses to the eloquent Kony posting, primarily from students who had done some of their own research based on what the Kony poster had written, saying that they were finding much of the same information online now that they knew where to look. The teacher also did some research, finding support for the Kony poster's position. During the next class session, the teacher read aloud the entire post on Kony and looked for the poster, wanting to introduce him, but once again he had not come to class. There was some discussion about the impact of childhood trauma on adult behavior. After class, the teacher e-mailed the Kony poster, congratulating him on his post and addressing the issue of his absence.

This anecdote highlights the dangers of isolating space from place, and the way difficulties can not only be ameliorated by, but actually become part of, a learning/teaching moment when space comes into dialectical relationship with the classroom. The original video posted by Invisible Children is in many ways a MOOC, but it also exemplifies, we would argue, Castells's fears about the potential for knowledge to become dominated by a small, privileged group with an Internet presence. The Invisible Children Foundation had been active for a number of years in schools and civic organizations in the United States and had developed credibility on Ugandan issues. While the video was presented as fact, it represented knowledge controlled by a small group with little actual connection to the villages of Uganda. If the conversation had stopped there, Castells's fears might have been realized. The local dinner table or classroom discussion would have had no effect on the global reach of Invisible Children through the Internet. When the Kony poster responded, he was bringing knowledge from his lived experience of Uganda to the conversation, starting an important dialectical relationship between

the Internet, his lived experience, the history and evolving culture in Uganda, and the classroom. Many of the other posters on the Internet who disputed the Kony video were engaging in a similar dialectical relationship between space and place, bringing their own lived experience into the space occupied by the Invisible Children Foundation. The Kony poster and others were able to use the Internet to inform not only the local classroom, but also a number of other places such as the daughter's school. The students were able to take this locally influenced global information and use it to help redefine their classroom.

Students were able to breach historical, social, and even cultural boundaries simply by clicking through a few links:

- *historical* because high school fundraisers for the Invisible Children Foundation had been common in the area for at least a decade, suggesting many of the students would have been comfortable accepting the veracity of the video;
- *social* because most of the students probably did not belong to local, offline networks where members had a strong knowledge of Uganda or even Africa; and
- *cultural* because traditional information networks in the area, such as newspapers and television news, rarely if ever offer detailed information about what is occurring in African countries.

The ability to move back and forth easily between local and global contexts, and for knowledge of the Internet not only to influence place but to be influenced by place, suggests that the Internet as a tool, separate from the processes of knowing and used simply as a way of promulgating and disseminating knowledge, is giving way to the idea of the Internet being integrated into the larger gestalt of our lived experience. As Tim Berners-Lee, the inventor of the web, suggests, the web is becoming something ''which is sunk into the background as an assumption.''[20]

Moving from the Internet as a Tool to the Web as a Gestalt

The idea of technology becoming part of the ''background'' of human activity and treated as an ''assumption'' has a philosophical history. In the 1930s, Ernst Jünger, a friend of Martin Heidegger, wrote a description of the dynamic relationships between humans and new technologies that turned out to be prescient for both short- and long-term understanding of technology integration.[21] Heidegger's ideas on technology, in particular the contextual totality of technological relationships, seemed to be an important influence on Jünger's thinking at the time, and, while he was more novelist than philosopher, his

20. Mark Lawson and Tim Berners-Lee, ''Berners-Lee on the Read/Write Web,'' *BBC News*, August 9, 2005, http://news.bbc.co.uk/2/hi/technology/4132752.stm.

21. Ernst Jünger, ''Technology as the Mobilization of the World Through the *Gestalt* of the Worker,'' in *Philosophy and Technology: Readings in the Philosophical Problems of Technology*, ed. Carl Mitcham and Robert Mackey (New York: Free Press, 1983).

writing was filled with a sense of foreboding and urgency. Jünger's description dealt primarily with war technology as it was developing in the decades after the First World War, but he also intended it to describe the developing human relationship to technology itself. Such writing has resonance in the Internet age.[22] According to Jünger, technological innovations move through three stages. First, when technological innovations are introduced to the society at large, they are in many ways seen as a threat to everyday well-being. New technological innovations represent possibilities for change that can be uncomfortable and force reconsideration of accepted technique. Early technology is not seen as an addition to everyday life but as an infringement upon it. The second stage is one of acceptance, even though we continue to see new technological innovation as separate from our core being. We begin to understand these new technologies as tools for achieving new possibilities. But, as humans, we maintain separateness from the new objects of use that Heidegger refers to as *technics*.[23]

We engage these technics within a larger arena of relationships with things in the world, but we remain consciously aware of them at all times. In the most positive scenarios, we treat these new technics as purveyors of new promise, but in the more negative sense — as Castells suggests with the Internet, and Dewey suggests with technology in general — they are treated as methods for controlling relationships with others or the future. From the Deweyan perspective mentioned at the outset of this essay, these new technologies are accepted and used functionally but "absent-mindedly, as far as [their] effects on human beings are concerned."[24] Technology is used without intelligence, to promote what we already know rather than to solve problems as we find them; such an approach subordinates the dynamic use of technology to the needs of the institutions that preceded it. If we apply this understanding to the Kony example, we see a foundation that had established its credibility over time use the Internet in an attempt to control knowledge for its own fundraising purposes.

In many educational circumstances, including MOOC sites, the Internet is used to disseminate static knowledge in an attempt to recreate the educational processes of the classroom. Both Jünger and Dewey suggest that this use of technology — as accepted but separate from everyday activity — is not sustainable. Jünger discusses the inevitable appropriation of technology by more traditional institutions, such as the military, to meet their own purposes. The modern equivalent in the Internet age could be the business community, sometimes in combination or collaboration with educational institutions (MOOCs or online charter schools). We believe that Dewey was also worried about this type of appropriation, but characteristically saw the issue in a more progressive light,

22. Jünger's article has interesting elements of fiction writing, including foreshadowing.

23. Martin Heidegger, *The Question Concerning Technology and Other Essays*, trans. William Lovitt (New York: Harper and Row, 1977).

24. Dewey, *Democracy and Education*, 365.

where we are proactive rather than reactive in understanding the meanings of these new technologies in our everyday lives.

It is in the third stage of technological development that new technics, merging with evolving techniques, truly become part of us and what we do, integrated into the larger gestalt of our everyday lives. We no longer really recognize these objects outside of our natural relationships with them in productive activity and in our relationships with others. The technology is integrated into intelligence as a process of problem solving, helping us to "stop, look and listen in making the plan of an activity."[25] We move from using technology *for* doing something to using the technology *in* doing things. Dewey related this intelligent use of technology to (his vision of) the scientific method, but Heiddeger's idea of a "workshop" might be more illuminating for the purposes of this essay.

The Workshop of Intelligent Activity

At this point a firsthand account may help illuminate the process of how we transition through these stages. The following example describes how one of this essay's authors personally experienced such a progression:

I sit at my computer and type on the keyboard, but I do not recognize it as a separate object that I can use to explore new possibilities. Instead I have moved through stages where I was initially reluctant to write using computer keyboards because I thought they compromised my writing in some way, holding firm to my trust in the efficacy of the pen and pad and the typewriter. When colleagues introduced me to the word-processing program WordPerfect, I began to think of possibilities, how I could write so much more quickly and edit without typing multiple drafts. I was giddy with anticipation every time I sat down at the keyboard. Today, I type these words without even a thought of the keyboard itself — it is a natural part of the gestalt of not only the contextual totality of writing, but also my life in general. If I try to explain this evolution to some of my younger students, they stare at me, perplexed, with little idea of what I am talking about since the technology of the computer keyboard has been completely integrated into the contextual totality of their educational experience from the beginning.

With respect to the topic of this essay, we suggest that that the dialectic between the technic and the contextual totality comes into play as we move from the second stage of control through use, to the third stage of technology integration. During the first and second stages, true dialectical development, usually pushed by imperatives of practical activity, is not really necessary. In the first stage, individuals' perceptions are focused on maintaining the status quo. In the second stage, individuals believe they are capable of controlling the technology as a separate object, so they perceive the contextual totality of the status quo and the new technic, existing together in activity, as an acceptable duality. The new technology is little more than a tool for promoting the institutions and systems that already exist.

25. Ibid., 103.

The perception of the object as a separate tool only becomes problematic when it becomes part of the gestalt of everyday activity, integrated into productive work so that it is no longer a tool of promise, control, or even necessity, but one of obviousness. If the new technology has a lasting impact, it is going to negate perceptions of the preexisting contextual totality in some way. Place is a critical part of the contextual totality — what Heidegger refers to as the workshop of our productive activity — and it is therefore one of the most noticeable and dramatic possibilities for dialectical change. Place contains two central ingredients for this dialectical relationship: first, boundaries that contain histories and developed perspectives; and, second, immediate local problems that often stand in juxtaposition to global knowledge, thus making it more difficult for preexisting institutions to control their use.

Let us return to the example of the typing keyboard. When I would write a paper, the ''workshop'' consisted of pen, paper, books, typewriter, and the ways in which they were all interrelated to the productive activity. Because it was cumbersome and time-consuming to make edits on the typewriter, I would write two or three drafts with pen and paper before typing a final draft. I was able to use the pen and paper anywhere, but I worked most often in a library because of access to books. The place of productive writing was a larger system that included the library, my office, and the table that held my typewriter. Initially, I resisted the electronic keyboard because I feared it would in some way make the writing less ''pure.'' As I began to trust the electronic keyboard, I still wrote out early drafts longhand, believing that the new technology would somehow steal my words. I was using the keyboard as an object that could make the typing of later drafts quicker and easier — a kind of ''super typewriter.'' There was nothing in this set of interrelationships that forced me to reconsider my perceptions of the place(s) of productive writing. When the electronic keyboard started integrating itself into the gestalt of my paper writing activity, I stopped writing drafts with pen and paper, something I once believed I would never do; my own activities had pushed me to reconsider how I perceived my workshop, the place where I did the productive activity of writing. The library dropped out of the system. Books were placed at the side of the computer. My office became the focal point of even nascent productive writing. I was far more tied to the keyboard than I had been to the typewriter.

In the Kony example, the Internet is moving from a tool of communication for the instructor and students to an integrated aspect of the classroom community, thus altering its underlying governing variables. The instructor had initially been reluctant to bring the Internet into the classroom, fearing that it would in some way detract from true education. When the instructor first started to integrate the Internet into the class, he was intent on using it as a tool, separate from but useful in education. The instructor could put material on the blog, track student discussions and responses, and collect assignments in a drop box. Indeed, the university promoted a version of Blackboard as an online tool for these purposes. However, the instructor saw himself as ''using'' the Internet for these purposes in much the same way that I ''used'' the computer to write papers. During the

Kony incident, this perception of the Internet as a useful tool moved into the background of the interactions. The Internet offered the students the ability to reach beyond the traditional boundaries of the place-based classroom to explore new information. The students were then able to bring back their ideas and use the best qualities of the classroom (for example, cohesive dialogue and a sense of community) to continuously reexamine the issue, creating an open and dialectical dynamic.

A Dialectic Based on the Practical Implications of the Internet

The discussion presented on the dialectical relationship between space and place depends on the recognition of G. W. F. Hegel's original definition of dialectical development, combined with Ludwig Feuerbach's materialist critique and Karl Marx's focus on practical activity as a primary force of change. Dialectical development is often described as the progression of ideas from initial thesis, to the presentation and challenge of an antithesis, and finally to a synthesis of the two that temporarily resolves the conflict. The assumption is that the new synthesis will soon take on the characteristics of a thesis facing its own challenges — leading to a continuous spiral of development. While this view of dialectics is seductive, especially because of the relative ease with which it fits into a developmental model as well as its successful use by a number of theorists and philosophers, it offers a less compelling, less nuanced mechanism of change than Hegel's actual dialectic. More importantly for the purposes of this essay, it is less applicable to the dynamic of evolving relationships with new technologies. We suggest that the idea of some type of synthesis between space and place is not the most productive way to conceptualize the relationship between the Internet and traditional places of production.

From an education perspective, the thesis/antithesis/synthesis model suggests moving toward some synthesis of the classroom and the Internet in learning/teaching activity — which is too close to the idea of using technology as a tool to achieve new possibilities in the classroom. There have been, for instance, a number of Internet-based education initiatives that attempt to develop a hybrid model of teaching and learning, some based on practical design and some based on theoretical imperatives, but all generally maintaining traditional perceptions of educational place where an instructor is encouraged to move traditional classroom activities to the Internet. Our point in this essay is not to say that this type of synthesis is wrongheaded, but that many of the important questions concerning the dynamic relationships between place and space might be better served by a more direct application of the Hegelian dialectic and its primary critiques.

Negation of Negations

The concept of negation of negations is closer to Hegel's original intent in introducing the dialectic as a mechanism of change, and perhaps a better fit for understanding the dialectical relationship between the Internet space and the meanings that traditional places have as part of the workshop of production. The mechanism of change in the Hegelian dialectic is what he refers to as the negation

of negations.[26] The initial state in our understanding or perception of an object is noncontradiction, bringing with it an illusion of stability of meaning; any combination of positives and negatives in the object are seen as part of a natural duality.

The traditional educational setting is often portrayed as a place where specific teaching/learning processes take place in association with an agreed-upon academic canon, with the quality of those processes being directly measured through testing (often standardized testing) on the topic. The optimum educational setting, however, is also seen as a place where students acquire skills that enable unique problem-solving capabilities not directly anticipated by what is being taught and tested. These are skills that can be quickly and successfully applied in the world outside the classroom. In this second perception, it is a place that primarily prepares students for lives far beyond the walls of the classroom. Individuals do not see a natural contradiction in these perceptions.

These two perceptions of educational settings as contextual totalities can survive side by side as dualities because there is no moment where either is negated by thought or circumstances. The second and most important step in the dialectic is what has been referred to as the dialectical moment.[27] This is when the individual realizes that the object of perception is a unity and that both views can't simultaneously exist as a duality in this unity. The individual is confronted with the question, how do standardized tests prepare students for practical living? How does a predetermined curriculum help in solving new, unanticipated problem sets? Hegel, who had an idealist orientation, believed the human mind would eventually recognize their perceptions as illogical through their self-conscious desire for truth. Standardized testing and pragmatic problem solving cannot exist simultaneously in the unified totality of educational processes. As a result, there is a forced reconfiguration of perceptions. From a logical perspective, the perception of the classroom must change so that what we believe learning is, and what we believe learning does, come into more logical alignment, bringing us closer to the ideal teaching/learning setting. The human mind has a natural inclination to move perceptions of objects toward this perfect form, and our minds will force us in this direction. All that has to happen is for some person to make the argument for change, perhaps through publishing a paper that fosters the dialectical moment within a critical population. Academia often promotes this type of dialectical development as its *raison d'être*, but it does not seem to happen very often — if ever.

Critiques of Hegel's Idealist-Based Dialectic

The place/space dialectic offered in this essay takes a much more material/practical activity view of dialectical development. Feuerbach, in

26. See G. W. F. Hegel, *The Science of Logic*, ed. and trans. George di Giovanni (Cambridge: Cambridge University Press, 2010).

27. Michael Forster, "Hegel's Dialectical Method," in *The Cambridge Companion to Hegel*, ed. F. C. Beiser (Cambridge: Cambridge University Press, 1993), 130–170. Here, Forster outlines the Hegelian dialectic as a three-step continuous process, with the dialectical moment as the second and most important step.

critiquing Hegel, makes the point that the development of our perceptions does not occur for transcendental reasons but for materially relevant, historical reasons.[28] To this, Marx added that the contradiction that drives the dialectical moment emerges from practical need, not transcendent thought. Humans do not see the need for dialectically driven change unless and until their practical, everyday activities more or less force them to do so. Even then, the dialectical moment does not reach the ''critical mass'' necessary for changing our perceptions until practical activity is clearly and directly challenged.

The dialectical moment discussed in this essay is much more delimited, direct, and individual, but it is still catalyzed by emerging practical challenges to the ways we perceive educational settings given the penetration of the Internet into everyday activity. In the Kony example, the Internet offered first the single student, and then the classroom community, capabilities for linking to and remixing new information. What might have previously been unchallenged, institutionally sanctioned information (the Invisible Children Foundation is well known in the United States) became contested ground that demanded further exploration. The social relationships that enabled coordinated, effective exploration were widely distributed and based in nonlinear linking structures. The absent student, the Invisible Children Foundation, the students in the classroom, the people posting information on the web about their own history in Uganda, and the daughter at the dinner table formed the social relationships necessary for the exploration of the topic to move from place alone.

Practical Activity and the Dialectic Between Educational Place and Internet Space

In spite of the development of interlinking autonomous Internet spaces and their continued impact on everyday activities related to or involving new teaching/learning relationships, many educational institutions have held tight to traditional perceptions of what educational settings should look like. For example, many MOOCs are re-creations of traditional classrooms through technologies enabling ''lecture capture.''[29] A simple example helps to illustrate this idea at the local classroom level. Many scholars and teachers will restrict or forbid the use of Wikipedia when assigning papers in their courses. At the same time, teachers and academics increasingly use Wikipedia as an important resource in arguments and discussions, even referring to it in private, anonymous reviews of articles. There are two important aspects of endangered unities involved in this example, suggesting that while a dialectical moment may not be occurring on any large scale, practical activities are pushing perceptions to their limits. The first aspect is that Internet-based projects such as Wikipedia are not reliable information resources for teaching/learning processes in educational settings, but they can be used as reliable

28. Marx W. Wartofsky, *Feuerbach* (Cambridge: Cambridge University Press, 1977). Wartofsky offers an important analysis of Feuerbach as a critical bridge from Hegel to Marx.

29. Lecture capture has been heavily promoted at the first author's institution.

and convenient sources in dialogue with other colleagues (including decisions as to whether new information should enter the academic canon). The second aspect is that Wikipedia can be used as an information source similar to the stable, (purportedly) definitive information sources, such as textbooks and encyclopedias, which are often used and promoted in traditional educational settings. However, Wikipedia is forthright in acknowledging that it is primarily crowd-source-oriented rather than expert-oriented. Any information on Wikipedia is only as good as its links, and many people who use Wikipedia seem to have little knowledge about how entries actually develop over time.

The dialectical moment leading to the negation of perceptions of traditional teaching/learning settings and the Internet as objects in the educational ''workshop'' will be based less on transcendent realizations and more on practical circumstances. For example, with greater use of Wikipedia by both teachers and students as a convenient, or appropriate, source of information, the dialectic is less Hegelian and more Feuerbach/Marxist. We suggest that there are two current perceptions of traditional educational settings and the Internet that are based on endangered unities, though they can, in many ways, be seen as part of the same unity. The first is that the traditional classroom will essentially remain the same, with the Internet serving as an addendum or teaching tool that in some way supplements the teaching/learning process (a common theme for educational technology). The second perception is the idea that it is possible to take traditional classroom practices and place them on an Internet platform where, with perhaps a little adjustment, they will function in much the same way but be available to a larger, less constrained audience. We suggest both perspectives are based on a false duality that everyday practical activity will make progressively untenable.

The practical activity that will challenge the dualities apparent in the ways traditional classrooms are using the Internet is already taking place, outside as well as inside the classroom, on both a small and large scale. On a small scale, individuals are creating their own learning activity networks based on interest areas and objects of desire.[30] These activity networks can be rooted specifically in Internet activities such as gaming, coding, or Internet-based group projects. It is just as likely that the dualities will be challenged by classroom activities where students, highly proficient in using the Internet, become bored, frustrated, or even hostile to traditional classroom teaching/learning activities and defy classroom structural systems by using unsanctioned applications such as Facebook. On a larger scale, there is the possibility of unexpected events seeping into the classroom as a direct result of Internet use, which cannot be controlled in the way many other educational tools can, and challenging the assumptions of both teachers and students in their perceptions of what an educational setting should look like.

30. The idea that objects of desire drive our productive activity was introduced by Eric Trist and the Tavistock group, based on the psychodynamic work of Melanie Klein and Eric Trist. See Eric Trist and Richard C. S. Trahair, ''Guilty of Enthusiasm,'' in *Management Laureates: A Collection of Autobiographical Essays*, vol. 3, ed. Arthur G. Bedeian (Greenwich, Connecticut: Jai Press, 1993), 191–222.

Changes in the meanings of online spaces and place-based classrooms are already occurring, but at different rates and in different ways for different populations. In his seminal account of the diffusion of innovations, Everett Rogers suggests five important components in the dissemination and use of new technologies that lead to creative reinvention.[31] These components, we suggest, reflect Dewey's "intelligent" use of technologies and Jünger's third stage of technological development in different ways. The five important aspects of diffusion are (1) the relative advantages offered by the technology; (2) the compatibility of the technology with activities of the individual/community; (3) the complexity of the new innovation; (4) the ability to experiment with the technology (trialability); and (5) the chance to observe, objectively, the outcome of this experimentation.[32] For the Internet especially, these components do not stand in isolation but are mutually dependent on each other. For example, the degree to which an individual thinks the Internet is complex will have an effect on relative advantage and compatibility, while the chance to experiment and observe will affect the perceived complexity.

Different populations have different types of experiences with the Internet: some are engaged in advanced reinvention while others are still in the initial stage of Jünger's scheme of technological development. This variety in levels of experience would nullify all five of Rogers's components for diffusion. With this in mind, Danah Boyd states that many times students are at the point of reinvention while teachers are struggling with even initial thoughts of compatibility, a disparity that is especially concerning.[33] This can create possibilities for tensions in the classroom, especially with regard to the relationships between the space of the Internet and the place of the classroom. There are also situations where teachers and students work together toward reinvention as the technology moves to the background. The following section describes what we see as an illustration of this process.

Dialectics of Space and Place in Elementary School Classrooms

A good example of a dialectical relationship between place and space comes from a consortium of elementary school classes around the world that have begun to use the Internet as background to extended communications and joint explorations. We focus on one classroom in that consortium, the public blog

31. Everett M. Rogers, *Diffusion of Innovations* (1962; repr. New York: Free Press, 1995).

32. We would suggest a symmetry between Rogers's components of innovation diffusion and Jünger's three stages. We struggle with the meaning and compatibility of technologies when they are separate from us. It is only when they become an integral part of our workshop that we can actually start reinventing innovations to fit our needs. Jünger is perhaps more cynical regarding this progression of technology, warning about the dangers that might emerge when we stop struggling with the meaning of new technologies and begin integrating them into our everyday needs and desires.

33. Danah Boyd, "Living and Learning with Social Media" (lecture delivered at the Penn State Symposium for Teaching and Learning with Technology, State College, Pennsylvania, April 18, 2009), http://www.danah.org/papers/talks/PennState2009.html.

of a second-grade classroom in Australia.[34] What is apparent from following the blog posts is the ways in which Internet innovations have been integrated into intelligence, in the Deweyan sense of an aim-directed activity, enabling an almost continuous stream of technological reinvention in an educational context. These reinventions suggest that online spaces as dynamic flows of information do not eliminate or even, in many cases, diminish bounded place, but they often fundamentally change perceptions of how place and time function in our lives. New types of interactive online spaces change our traditional conceptions of how we define and interact in place, often in ways that are unique to the goals of related online autonomous project groups. Just because online communities are autonomous does not mean that they do not have, or indeed need, relationships to specific place(s). Place offers opportunities to establish identities, affiliation, and consistency of purpose — in other words, any production-oriented, successful contextual totality is going to have some relationship to place.

The example of the dialectic between physical place and space is illustrated by the relationship between this second-grade class and the adventurer Alastair Humphreys. The class had been following ''Al's'' blog and knew he was rowing 3,000 miles across the Atlantic for charity. Al was blogging from his boat, his linking tentacles reaching out to a number of places around the world — especially classrooms. The teacher of the class helped set Alistair's place as a bounded ecological system by displaying a map photograph on their shared blog along with a picture of the boat Al and his crewmates were rowing. Al arranged to call during their class time. Many of the posts appearing on the class blog were about how extraordinary it was to talk to Alistair from the place of their classroom as he was rowing in his place of the boat in the Caribbean. As one student put it, ''It was amazing that we got to talk to someone who is on his way to Barbados.''

But what may have really opened up the dialectical relationship between the developing space and place, and the way definitions of both are continuously shifting through Internet connections, is when the class received a comment on their blog about Alistair from another second-grade classroom in the United States that was also following Al's blog. That comment referred to a third classroom in England, both interlinked classrooms also having received a phone call from Alistair. Humphreys was making connections with classrooms on different continents, and the classes were then able to find each other and share their experiences, connecting separate places through their blogs as part of a space of flows about Alistair. All of the interconnected classrooms began to recognize themselves as part of a network of nodes linking into Alistair's adventure, forming the same type of exploratory social relationships seen in the Kony example discussed earlier. This is apparent in the following post by the teacher in the Australia classroom:

34. Team teachers Katherine Morris and Kelly Jordan integrated blogging into their second-grade class, developing a yearly 4KM 4KJ blog: http://4kmand4kj.global2.vic.edu.au/2012/02/11/phone-call-fro-the-atlantic-ocean/.

> We are tracking his newest adventure too. Our friends — A Room with a View (England) also got a phone call last week so we've read their post about that plus we've visited his web site. Your great post adds some more information for us. This started out when we both started reading a book called A Boy Who Biked the World written by Alastair Humphreys. We have followed Tom (the character) through various countries and we are now in Ethiopia. We wonder if he'll eventually write a book about his Atlantic adventure.

The three classrooms were able to begin developing a proto-community based on their relationship to Alistair as a primary shared hub (tied to the activity of his rowing for charity), the fact that they were all following his blog, and that they all had received a phone call from him. The classes were able to enter each other's ongoing communities and discuss their feelings about and history with Alistair. The relationships fostered in the space between the classrooms and Al provided opportunities for each to engage with experiences occurring outside the boundaries of their respective places.

One of the interesting aspects of the developing network was that while the different classes were amazed at how they were able to connect with Alistair as he rowed the Caribbean, they did not seem to even notice that they had created a worldwide network among themselves. They had all visited so many blogs that it had become a natural part of their educational, exploratory activities. Each class used the discussions of Alistair and his work in their own place-based classrooms to create and redefine the space that connected them and Alistair. The teacher, by integrating lessons of geography and social relationships into lesson plans, was able to seamlessly reinvent the technology and use it as background for increasing both the curiosity and the knowledge of the students.

Conclusion

It is important to acknowledge that the Internet is a very fast-moving phenomenon, with implementation often preceding implications. Many of the changes that have emerged from Internet penetration, and the expansion of the web, have been unexpected. This will probably continue. However, perhaps more importantly, the Internet has become part of the gestalt of the everyday lives of a large, technology-infused younger generation. There is a growing disparity between those who see the Internet as background to their everyday experience and those who continue to view the Internet and the web as tools that offer new possibilities, new means to control information, or both. One of the flashpoints for this disparity is our educational system, where the traditional mentor–neophyte model has been turned on its head. We need to quickly develop our understanding of how the Internet changes teaching/learning processes and settings, and of how these processes might change the Internet.

We need to develop new types of intelligence for the Internet — intelligence in the sense of how we use the Internet on an individual level to solve problems and engage community,[35] but also concerning what these actions mean at an

35. Consider, for example, the types of Open Source Intelligence discussed in Michael Glassman and Min Ju Kang, "Intelligence in the Internet Age: The Evolution of Open Source Intelligence (OSINT)," *Computers in Human Behavior* 28, no. 2 (2012): 673–682.

institutional and social level. One of the most important issues is the way in which space and place change as the new technology becomes a part of everyday life. This is not the first time humans have had to change their perceptions based on technological innovation: this is a function of a migratory species, and it is a perception that has been challenged significantly through the industrial and nuclear ages.

Philosophers such as Dewey, Castells, Jünger, and Rogers have provided something of a road map for understanding the problems that a new, pervasive technology poses. There seems an agreement that we must move from seeing technology as a separate tool to integrating technology into what Dewey terms intelligent action. Understanding the dialectical relationship between spaces of flow and bounded place is a critical component of this movement.