Teaching and Participatory Media

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Introduction

The concepts of technology and media are often discussed though not so often defined, perhaps as they are so much a part of popular discourse and hence thought not to warrent an explanation. Web 2.0 has been of late, pretty well labelled, defined and examined as a concept. One of its aspects it how it allows for is greater participation by its uers. Here we will discuss how this relates to the concepts of media and technology. We will look at how Moore's theory of Transactional Distance, as applied by Dron to Web 2.0, might help us find a frame to tease out beneficial pedagogical consequences of new media. Lastly a prototype will be described which demonstrates the use of participatory media in teaching.

What is Participatory Media?

Participatory media comes about when the effort required for the generation of media falls to almost the effort of its consumption. As this occurs the distinction between consumer and creator becomes less meaningful. Indeed the very act of consumption may be an act of creation. Take, for example, someone viewing a video clip on YouTube. This person may be inspired to make a copycat video (known in YouTube as a "response"), email a link to the video to their friends, copy it to their Facebook page, tweet it, save it with a social bookmark, rate the video from one to five or leave a comment in free text format for others to see on the YouTube site. In all of these efforts they will have turned creator in some way, actively contributing to, shaping or re-contextualising a message. However even if the viewer does none of these things, the very fact that they have anonymously watched the video will be recorded and added to that video's "times viewed" record. How many hits or views a video has is displayed beside it and this may feed back into the environment, for instance triggering a clip to be featured in a "most viewed" list, which will in turn ensure more views and further participant-medium feedback loops. Crucially, unlike books or television, there is no truly passive consumption here: even viewing media has a consequence, is an action. Everywhere we go in the digital world we cannot help but leave trails of digital fingerprints which themselves ripple out and become part of the fabric of that world. We are participants in media.

Beyond Web 2.0

In many respects we could equally say Web 2.0 instead of participatory media here. This would give us useful definitions of the subject such as "software that supports group interaction" (Shirkey, 2003) or "social software" which according to Dron, "treats the group as a first-class object within the system" (Dron, 2007b). Web 2.0 is considered to comprise a plethora of web

applications and techniques such as blogs, wikis, tagging systems, collaborative filtering, user or "grassroots" video, social networking sites, web-based rating, reviewing and recommender systems etc. The list grows the further one delves into the Internet's Long Tail (Anderson & Andersson, 2006), a situation which is wryly encapsulated by the term YASN (Yet Another Social Network) (Alexander, 2006). The term Web 2.0 itself is attributed to media guru Tim O'Reilly (2005). In his seminal article on the topic O'Reilly stresses that the fundamental break with older ways of working is that users are now being enabled to build their own services, indeed the very services they use. This is what Dron refers to as emergent or bottom-up design (Dron, 2007b). However in considering education, Dron warns us that we should not fail to consider the concept of scale. Web 2.0 occurs on a massive scale. Many of the successed of key Web 2.0 applications occur because they have millions of users, and even if only a tiny fraction are active contributors, this will still be a vast number. Because of their nature Web 2.0 applications can grow extremely rapidly. By contrast, older, more stable societal formations, such as governments and educational institutions grow and change much more slowly. In addition the enormity of the web cannot be crammed into the comparatively miniscule classroom. Web 2.0 may tolerate free-riders and safely rely on the the industry of a tiny minority of active contributors, because they are still a massive number, but this cannot stand in the classroom. Here participation in some form, at some stage, will be mandatory.

Technology Versus Media
There is a problem with the term Web 2.0 for our purposes here. The name itself was coined as a geeky joke. Suggesting that the web was similar to a software program – with version numbers for different releases and associated feature sets – was then (to some) amusing. Web 2.0 is about technology and its kin. There are many important technical aspects behind it. For instance O'Reilly has proposed that the Google PageRank Algorithm is the archetypal example of what Web 2.0 is. Although this may be interesting in itself, it is quite technical, and may distract us from another aspect of this general phenomenon that we need, as educators, to concentrate on. We can instead approach this topic precisely at the point where technology is superseded. Let us say that Web 2.0 is caused, not by the interaction of many web technologies, but simply by technological maturity. And not just maturity of the technologies, but an interplay between the knowledge and numbers of the designers of the technology and the capabilities and expectations of the users. When technology becomes mature in this sense, we take it for granted. It becomes ubiquitous insofar as, although we use roughly the same type of screens and input devices to access roughly similar content, we do so now to the point that we no longer think about it. When the use of a technological application becomes a "no-brainer", then let us call it media instead. This has a familiar meaning to us. We consider reading a book or watching television as not requiring major specialized skills beyond those of language. Media is something simple, boring, effortless to use. So under this formulation we will have new media continually emerging from technology, products of iterative refinement processes that drive not only usability but now also participation.

Participatory Media & Educators: It's Not About Age
One of the most oft-cited pieces of this decade on the impact of technology upon education has been Prensky's *Digital Natives and Digital Immigrants* (2001). A younger generation who grew up immersed in mobile phones, SMS texting, the web, television, computer games etc. are *Digital Natives* according to Prensky and have a natural propensity for technology, while the older *Digital Immigrants* struggle with it in a more cumbersome fashion. Despite some fairly wild claims that technology was physically changing the brains of younger people, educators have accepted the general idea of the "Digital Divide" between Natives and Immigrants. Perhaps the most powerful aspect of Prensky is how he entreats us to reflect on the difference between students and teachers and where we should meet them: "As educators, we need to be thinking about how to teach both Legacy and Future content in the language of the Digital Natives" (Prensky, 2001 .p. 4).

A problem however with the Digital Divide paradigm is its techno-centricity. Different brains are required for operating different technologies. In our formulation of participatory media however, this is not the case. In fact, no significant "brain power" worth mentioning should be required for using media in our sense of the term. There is also now evidence to suggest that the supposed correlation of age with technical ability is overstated. Facebook started out among college students and not high school kids, whilst Twitter started out among an even older cohort, only later filtering down to usage amongst teens, as highlighted by a recent Morgan Stanley report (Knowles, 2009). The issue then is not simply about age, but rather the different media themselves and how usable and useful they are to us.

Transactional Control
 We can try then not to be unduly worried about age or technical competencies. We will leave Web 2.0 aside because it cannot fit into the classroom and because we are not focused on the web or technology per se but rather on media. A conceptual pedagogical framework may still be needed, a way to assess what media can do in the specific enterprise of formal education. In the spirit of usability we will adopt, for its relative simplicity, Dron and Moore's Transactional Control theory. We will use it sparingly and perhaps, begging the forgiveness of its authors, in a more simple fashion than it may have been intended (Dron, 2007a; Moore, 1993).

Dron has applied Moore's theory of Transactional Distance learning and in doing so expanded upon it, rechristening it as the theory of Transactional Control. This theory looks at education from the perspective of the variety of choices in a learning transaction and who has control over making those choices. At one end of a spectrum a teacher may ostensibly have most of the control over say a classroom. The teacher may hand control to the learner at various junctures such as during an assessment, when the learner has control and must make choices. The teacher, or indeed the learner's peers, may give feedback on the choices of the learner. As a learner moves through a learning trajectory they may be able to negotiate more control from the teacher. This

learning trajectory may happen within a class, a term or even as a student moves from undergraduate study, where many of their choices may have been taken from them, to becoming a PhD candidate who is an almost completely autonomous learner being perhaps by that stage a leading expert in their field of study.

Control for learners may be useless if they do not know how to use it, but at the same time, vesting too much control in the teacher can lead to an equally unhappy state. Dialogue is the ideal intermediate state according to Dron:

From a learner perspective, being given control without the power to utilize it effectively is bad: learners are by definition not sufficiently knowledgeable to be able to make effective decisions about at least some aspects of their learning trajectory. On the other hand, too much teacher control will lead to poorly tailored learning experiences and the learner may experience boredom, demotivation or confusion. Dialogue is usually the best solution to the problem, enabling a constant negotiation of control so that a learner's needs are satisfied (Garrison & Baynton, 1987). Unfortunately, dialogue is expensive and becomes more so the fewer participants are involved. The ideal would be to allow the learner to choose whether and when to delegate control at any point in a learning transaction. (Dron, 2007b ,p. 61)

Online Discussions
One of the most obvious realizations of this type of dialogue is in web-based discussion forums that happen asynchronously in time. This has been a fruitful area for researchers, with Salmon being one of the best known in this area for her work on e-Moderatorship (Salmon, 2004). Dron examines interaction in online discussions through theories of Transactional Control (Dron, 2007a) and it is easy to see how this medium lends itself to formal learning scenarios. One of the crucial aspects of web-based discussions that happen asychronously is that they scale. Conversations can be threaded for instance to allow organised branching into separate sub-topics within a topic. Moreover as the conversation does not happen in real-time, a participant has more time to read and consider information before they respond and more time to write their response. To constrain the dialogue and prevent it getting too unwieldy, many pedagogical strategies for online discussion require students to summarize each others postings and to arrive at summarized conclusions, according to a prescribed format or at the intervention of the teacher.

Classroom Response Systems
It is perhaps hard to appreciate how effective asynchronous online discussions are, until one tries to conduct a conversation with multiple people in a realtime text-based system such as instant messaging. Topics or threaded discussions are not really possible and you must compose your response rapidly before the conversation moves on. Conversations can very quickly degenerate into an incomprehensible babble. This should not surprise us really. We do not allow everyone to talk at once in the physical classroom because the result would be

anarchy. The problem is one of information overload. Indeed in physical situations the effects are even more pronounced, as we exchange so much information subconciously through our body language and through vocal tone and intonation. A recent innovation in answer to this has been electronic Classroom Response Systems (CRSs). With these types of systems, students can contribute during class, in a constrained way, by using hand-held devices that allow them for example to vote on multiple choice questions which the teacher shows on whiteboard. A review of studies into CRSs reported that teachers found the systems a useful tool to use during lessons often in conjunction with class discussions (Fies & Marshall, 2006). Crucially this tool provides a link between the passive lecture and the buzz of an active tutorial. It allows for choice to be provided where there was none, or for choice to be constrained where there was an over-abundance. We can easily call the CRS an example of a particiaptory medium. This would not be possible if we were focused purely on using the term Web 2.0, as a CRS is definitely a product of the classroom and not the wildness of the web.

Microblogging and Twitter
There are, however, forms of media available on the web that in many repects resemble, or can be made to resemble, CRSs. Microblogging has been the latest massive web phenomenon. Twitter has garnered most of the hype around micro-blogging as users flocked to use it. Essentially microblogging was initially intended to be a service that was accessible by both SMS text and Web, so message posts were constrained to 140 characters. Posts to twitter, known as tweets, give short status updates about what a user is up to. This message is broadcast to the whole twitter network and anyone subscribed to that user will see the message. As twitter evolved a rudimentary addressing system was added to allow users to address each other directly. These messages could be private or public. One of the interesting aspects of Twitter is this blurring of the private and public realms. The short messages feel intimate like SMS but the difference is that they are being broadcast to a network of contacts. This makes twitter a more informal and urgent sphere but one that is not as fast or chaotic as real-time instant chat. Twitter still happens asynchronously but it is much faster than a traditional web discussion forum. However the character limit constrains the amount of information and thus allows twitter to scales better than full blown Web-forums. We can see here that in adding constraints to the communication medium, in order to allow group participation, Twitter is a lot like CRSs. It is also interesting to note that Twitter, like SMS, came about almost by accident. We are not given to designing systems that purposefully do less. We can contrast the growth of fundamentally text-based media such as the Web, SMS, email and Twitter with more interactive and immersive ones such as video conferencing, virtual worlds, virtual reality etc. The former have more users and may be more useful to us, but the latter are more seductive and often predicted to be the next big thing as soon as they are ready for the mainstream, which will be any time now.

Connectivism & Microblogging
Twitter has both public and private modes. If a user chooses not to protected their updates on Twitter then their update stream can be seen by anyone (so

long as they happen to be looking). Because updates may be public users can see the conversations other people are having. If someone you follow is having a conversation with a third party this may allow you to get to know this third person. In this way people can expand their networks by following the direction of tweets from people that they follow. Users may see fragments of a conversation between someone who is in their network and someone who is not yet in their network. If they then follow this second user they have added them to their network. This is a viral aspect of Twitter that has proven relatively resistant, thus far, to serious spam problems. It can also allow us access to information from world experts in a field of study or enterprise. Those people may be reluctant to spend their time answering long questions one on one with strangers but may be happy to answer a question when the reply will go to a whole group and the response will only take up 140 characters of their time. Fundamentally, micro-blogging services such as Twitter tap into our impulse to connect with other people and for new information to be mediated to us through these connections. Stephenson puts this concept well:

> Experience has long been considered the best teacher of knowledge. Since we cannot experience everything, other people's experiences, and hence other people, become the surrogate for knowledge. 'I store my knowledge in my friends' is an axiom for collecting knowledge through collecting people. (Stephenson, 1998 ,p. 3)

Twitter as Classroom Medium
Twitter is a very simple medium. Most people with access to a phone or a computer can start using Twitter very quickly. This has undoubtedly been a factor in its rapid growth and its use among a very wide spectrum of people. Twitter is most definitely not for geeks only, even though it may have started there. The celebrity use of Twitter is proof, for our purposes, that Twitter is definitely media and not technology. It can be used in a very simple way just as CRSs would be in a classroom. For instance, a teacher could create a poll (multiple choice question) by using one of the free online polling applications based on Twitter (e.g. polldaddy, twtpoll, strawpoll). Students could respond to this poll by SMS or by web if they are at a computer or web-enabled device. This system is more ad-hoc than a CRS and may not be suitable, for instance, for formal summative assessment which counts towards credit. However for keeping teachers and students awake it may be just fine.

Teachers have also used Twitter as a conversational tool to ask people in their network questions while the class watch on. Or students may ask questions themselves either through the teacher or directly. This format obviously raises issues of privacy and trust as the teacher is effectively opening up his/her classroom to the big bad Web (albeit only a very select slice of the Web). Tom Barrett for instance has been an active experimenter with using Twitter in the classroom in this way and writes extensively about it on his blog (Barrett, 2009). Similarly, a teacher and class may team up with a twinned remote class via a Twitter exchange (EDUCAUSE, 2009). Of course Twitter can also be used as a basic broadcast mechanism for alerting students to class-times, deadlines etc.

Media becomes Technology: Coming Full Circle

One of the real strengths of the Web is its open architecture which makes building on top of it very easy. In Web 2.0 terms the process of taking two Web applications and creating something new by somehow aggregating or joining them is known as a mash-up. Creating a mash-up or add-on to an existing Web service generally involves some basic level of computer programming. This is where media becomes technology again. Using one of these derived applications is often very simple however, such as the Twitter polling services which allow user to set up multiple choice questions or polls which users can vote on. Twitter has quickly become not just a text-based message service but one that weaves images, links, videos, audio etc.

Since Twitter was first launched I have been looking at different ways it can be used and publishing these musings on a blog (www.rElearn.ie) to get feedback. It is possible for instance to route Twitter into and out of Virtual Learning Environments such as Moodle. Although Twitter is very easy to use, it does still require the step of setting up a Twitter account first. To use SMS based microblogging without having to set up a Twitter account I developed a simple SMS router for my Nokia N95 phone. This programme uses Python for P60 Symbian devices and consists of a simple script that redirects all SMSs the phone receives to another number. This script is available as open source software under the GNU GPL version 3 http://www.relearn.ie/very-simple-sms-auto-forward/. If this script is set to redirect to the number of a Twitter account, a single Twitter update stream can be created from the SMS texts of multiple people. This allows simulation of a subset of the features of micro-blogging.

A basic polling system was then written designed to take a single stream of updates and generate poll results. This programe is developed in Python using Google App Engine, a web-based development platform currently free for a basic level of use. The programme is available at http://smspoll.appspot.com and its source code is available from http://www.relearn.ie/sms-poll-for-google-app-enginge/ again under the GNU GPL version 3. The programme takes a Twitter status update stream, a question and a list of options and creates a poll. It displays the results of the poll in graphical form.

Using these two scripts, a Twitter/Google App Engine/Nokia N95 mashup was created. It works as follows:

- Users send SMS texts to the Nokia phone which has the auto-forward script activated
- The phone forwards texts as updates to a single Twitter account
- If the content of the messages are digits they are assumed to be answers to the poll and are displayed by the poll application.

This content will be shown on the screen in the classroom, lecturer theare, conference room etc. Essentially this is a demonstration of how micro-blogs

such as Twitter may be used as CRCs. CRCs are generally expensive. In comparison all participants in this case must sign up to a Twitter account which is free. After this all they need is a computer or mobile computing device to access Twitter. At the simplest level they can do this with any device that can send SMS. This software was written to enable users to participate without having to set-up their Twitter accounts beforehand and instead simply text a number using their phones.

Other interesting things can be done with this single Twitter feed. For example, it can be fed through software that analyses and tries to group word content. The concept of user generated tags, which may give rise to folksonomies, is one of the truly amazing phenomena of Web 2.0 (even though their full utility or implications for use in the education may yet be unclear) (Costello, 2007; Dron & Anderson, 2009; Mathes, 2004). The basic premise is that information may be classified or organised according to how it is actually used rather than trying to fit information into pre-existing and unchangeable categories. This can make web-based information more organic. Delicious tag clouds are a good example of this. Delicious is a social bookmarking service where users bookmark webpages they like and label each one with tag words that describe the page's contents. A group, or cloud, of tags is then generated by Delicious from multiple users, allowing users to find other users who have used similar tags and find related content. We can simulate this on a small scale by running our Twitter stream through a word cloud generator such as Wordle. The oral presentation of this paper will demonstrate these concepts based on what the audience texts (tweets) to the presenter.

Conclusion
The microblogging service Twitter has rapidly become a valid medium for all kinds of scenarios, from organizing political resistance in Iran to its use as a back-channel for academic conferences (Reinhardt, Ebner, Beham, & Costa, 2009). One of its key abilities is to constrain information. We have seen that constraints are important in making technology more usable and especially for managing interaction in groups. Group interaction in itself is complex and education is a classic example of it. We have seen that control of choices is related to constraints, because, perhaps counterintuitively, constraint can increase choice, can foster participation. We need to consider whether a given educational tool is a technology or a medium. And if it is a medium, is it a particiatory one? It is proposed here that micro-bogging services such as twitter do constitute such a medium. They are easy to use and they may prove a disruptive technology that evetually supplant more expensive tools we currently use such as CRC systems.

References

Alexander, B. (2006). Web 2.0: A new wave of innovation for teaching and
learning? *EDUCASE REVIEW, 41*(2), 32-44. Retrieved from EDUCASE
REVIEW database.

Anderson, C., & Andersson, M. P. (2006). *The long tail* Hyperion New York.

Barrett, T. (2009). *Plan, tweet, teach, tweet, learn, smile | ICT in my
classroom.* Retrieved 7/27/2009, 2009, from
http://tbarrett.edublogs.org/2008/03/07/plan-tweet-teach-tweet-learn-
smile/

Costello, E. (2007). Reuse through rapid development. Paper presented at the
*Conference Proceedings of the International Symposium for Engineering
Education,* Dublin, Ireland.

Dron, J. (2007a). *Control and constraint in e-learning: Choosing when to
choose* (1st ed.) Idea Group Publishing.

Dron, J. (2007b). Designing the undesignable: Social software and control.
Journal of Educational Technology & Society, 10(3), 60-70. Retrieved from
http://www.ifets.info/

Dron, J., & Anderson, T. (2009). Lost in social space: Information retrieval
issues in web 1.5. *Journal of Digital Information, 10*(2)

EDUCAUSE, I. A. (2009). *Seven things you should know about twitter | EDUCAUSE learning initiatives.* Retrieved 7/27/2009, 2009, from http://www.educause.edu/ELI/7ThingsYouShouldKnowAboutTwitt/161801

Fies, C., & Marshall, J. (2006). Classroom response systems: A review of the literature. *Journal of Science Education and Technology, 15*(1), 101-109.

Garrison, D. R., & Baynton, M. (1987). Beyond independence in distance education: The concept of control. *The American Journal of Distance Education, 1*(3), 3-15.

Knowles, J. (2009, 13 July 2009). Twitter is not for teens, morgan stanley told by 15-year-old expert. *The Guardian,* pp. 12-12. Retrieved from http://www.guardian.co.uk/business/2009/jul/13/twitter-teenage-media-habits

Mathes, A. (2004). Folksonomies-cooperative classification and communication through shared metadata. *Computer Mediated Communication,*

Moore, M. G. (1993). 2 theory of transactional distance. *Theoretical Principles of Distance Education, ,* 22.

O Reilly, T. (2005). *What is web 2.0.*, 03/08/2009, from http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1-6.

Reinhardt, W., Ebner, M., Beham, G., & Costa, G. (2009). How people are

    using twitter during conferences. *Proceeding of 5. EduMedia Conference:*

    Creativity and Innovation Competencies Onthe Web, Salzburg. 145-156.

Salmon, G. (2004). *E-moderating: The key to teaching and learning online*

    Taylor \& Francis Group.

Shirkey, C. (2003). *Social software and the politics of groups: "networks,*

    economics, and culture" mailing list. Retrieved 7/23/2009, 2009, from

    http://www.shirky.com/writings/group_politics.html

Stephenson, K. (1998). What knowledge tears apart, networks make whole.

    Internal Communication Focus, 36, 1-6.