

Web 2.0 as a Catalyst for Rethinking Teaching & Learning in Tertiary Education: A Case Study of KDU University-College (Malaysia)

Alwyn Lau

KDU University College

Web 2.0 signals a move away from the Internet as a passive collection of computers sharing information to the Web as an active network of people who collaboratively shape and create new realities. This paper outlines five trends impacting education as a result of the Web 2.0 phenomenon (connectivism, digital creation, collaboration, divergent assessment and open courseware) then shares the research performed on faculty and students of KDU University-College, the first college in Malaysia to implement an e-forum for the Malaysian Ministry of Higher Education's compulsory subjects. The research asks questions about the benefits and/or challenges which Web 2.0 have brought to teaching and learning, the extent to which the five characteristics have impacted the students, lecturers and management and other issues. It will highlight key findings and recommend broad action-steps forward, both in the national and global context.

Keywords: Web 2.0, e-learning, open learning, assessment, connectivism, education, collaboration.

Web 2.0 (An Introduction)

Web 2.0 is the wave of Internet usage characterized by collaborative sharing, blogging, real-time journaling and other media applications broadly lumped under the heading of 'social networking media'. These applications would include the popular tools and websites like Facebook, MySpace, Linked-In and Bebo, all of which are (understandably fuzzy) expressions of the move towards the creation of online communities and networks which harness the collective intelligence (O'Reilly, 2006).

Web 1.0, being the first 'wave' of Internet familiarity and usage, focused on what individuals can do online qua individuals. These common tasks would include downloading files, creating a (usually static) Web presence in the form of personal websites, viewing and listing information and browsing in general. Web 2.0 signals a move away from the Internet as a mere collection of computers passively sharing information to seeing the Web as an active emergent network of people who are enabled to not only interact more closely but to collaboratively shape and create new realities. From the initial emphasis of consuming what was 'out there', now surfers are acting as 'pro-sumers' who use and share objects and cyber-goods for their own use and satisfaction.

Drumgoole (2006), in true intuitive Web 2.0 fashion, writes in his blog that: "Web 1.0 was about *companies*, Web 2.0 is about *communities*... Web 1.0 was about *wires*, Web 2.0 is about *wireless*... Web 1.0 was about *owning*, Web 2.0 is about *sharing*... Web 1.0 is about *web forms*, Web 2.0 is about *web applications*... Web 1.0 was about *hardware* costs, Web 2.0 is about *bandwidth* costs."

In a word, Web 2.0 is a new *state of mind* (Heuer, 2006) on how to be, behave and engage with the global Web community.

Web 2.0 in education is a sub-component of the more generic term, e-learning, in that the latter involves any and every use of the World Wide Web for educational purposes. Bates (2004) notes that since 1995 when the World Wide Web emerged, online universities have bloomed ranging from public and private partnerships to national and international consortia to the creation of virtual schools.

However, e-learning prior to Web 2.0 involves primarily *supplementing* traditional pedagogical modes with an online component (e.g. clicking on the correct answers, obtaining educational materials online) whereas social networking encourages a more constructivist approach which makes deeper use of reflection and discussion, and in which educational design is reconsidered (e.g. e-forums, collaborative learning, problem-based learning, etc.).

Five Trends in Web 2.0 & Education (A Literature Review)

This essay will first outline five trends impacting education as a result of the Web 2.0 phenomenon. It will argue that Web 2.0 has and will continue to transform e-learning such that educational institutions (and pedagogical thinking) will be unable to ignore the emergence of the below characteristics

Connectivism

This is a theory of learning which acknowledges to the extent to which the learner has connected (digitally) with learners (incl. non-human ones) with divergent views. Developed by George Siemens (2005), connectivism pulls together our understanding of learning with and 'into' the Web, making the former inseparable from a continually productive use of the latter.

Often contrasted with other learning theories like behaviourism, cognitivism and constructivism, connectivism is the latest (re)definition of what learning *is*. This question is undeniably significant in a world where computers and the Internet have become ubiquitous and whole economies rely on them. No longer, argues writers like Siemens, can learning be understood as the mere replication of observable behaviour (i.e. behaviourism), the coding, manipulation and re-presentation of information (i.e. cognitivism) or even the creative design and building of new objects or meaning (i.e. constructivism).

Learning cannot be fully understood apart from the phenomenon of forming connections. Too much complexity has emerged in the world such that *competence* and *mastery* must be seen as a function of being linked to divergent networks, non-human sources and interactive nodes; of being able to 'see' new connections and to distinguish significant from non-significant ones; of making sound decisions about one's learning (as an act of learning itself); even, especially in the context of Web 2.0, of being able to "store one's knowledge in one's friends" i.e. the understanding that one's learning grows together with one's number of contacts/friends (see Stephenson).

The principles of connectivism are summarized (Siemens, 2005) as per below (emphasis added):

- Learning and knowledge rests in *diversity* of opinions and is a process of connecting specialized nodes or information sources; nurturing and maintaining connections is needed to facilitate continual learning; the ability to *see* connections between fields, ideas, and concepts is a core skill.
- Learning may reside in *non-human* appliances and *currency* (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- *Capacity to know more* is more critical than what is currently known
- *Decision-making* is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

It is easy to see how the theory forms and is formed by Web 2.0 trends. More and more students are using the Internet as part of their everyday lives, and more and more of them are less and less satisfied with being passive users. Real-time connection, autonomy, total flexibility, continual creation and instant updating are the norms of Web life. Flew (2004) has noted the ways the Internet has evolved from the 1990s' onwards, one of which is how the Web is much more, "integrated into the everyday activities of individuals, the conduct of organizations, and the pursuit of commercial activity."

If the act of being alive is becoming virtually (pun intended) synonymous with being connected (in more vigorous and creative ways), then the act of learning cannot be grasped as if connections were of low importance. This follows on the idea that the act of *working* can no longer remain the same, having been transformed by what Manuel Castells terms the 'network society' which has begotten a new economy which depends, "on innovation as the source of productivity growth, on computer-networked global financial markets, whose criteria for valuation are influenced by information turbulences, on the networking of production and management, internally and externally, locally and globally, and on labor that is flexible and adaptable in all cases." (Castells, 2004)

If this is right, then problems will abound for educators and educational institutions who have not yet made the shift to a connectivist mind-set; lecturers and colleges still promoting rote-learning or failing to incorporate cyber-oriented concepts as a central feature of their teaching are certain to encounter student problems such as

boredom, inattention, non-enthusiasm and difficulties linked to differences in a central understanding of what it means to learn.

Digital Creation, Collaboration & Divergent Assessment

A strong corollary of connectivism is that learning outcomes must include a digital-cyber component i.e. digital literacy in the form of technological constructivism and creation becomes a non-negotiable and students (and, most importantly, lecturers!) must be taught to build digital objects *as part of* their learning.

If we are to avoid the destructive disjuncture between students who navigate informally in Web 2.0 contexts but are required to undergo formal instruction in Web 1.0 environments (Lankshear & Knobel, 2005), schools and colleges must build encourage both students and educators to move *higher up* along Bloom’s digital taxonomy (Churches, 2009), itself based on the revision to Bloom’s taxonomy (Anderson & Krathwohl, 2001).

Again, this is not about just switching from traditional media to cyber-media; it’s about redesigning what learning involves and is all about. Educational syllabi, ‘task-sheets’, homework and other learning activities – to be consistent with the tenets of connectivism – must be tied in and inseparable from the goal of nurturing Web 2.0 literacy. Digital-literacy skills (e.g. blogging, podcasting, etc.) ought to be considered as important (if not more so) than information-literacy skills (e.g. referencing, citation, etc.), without rejecting the latter.

Bloom’s (or Churches’) *digital* taxonomy (see Figure 1) also exposes a potentially gaping divide between the higher-order digital skills that the younger generation of students possess and the lower-order ones which the older generation of educators are as yet struggling with(!).

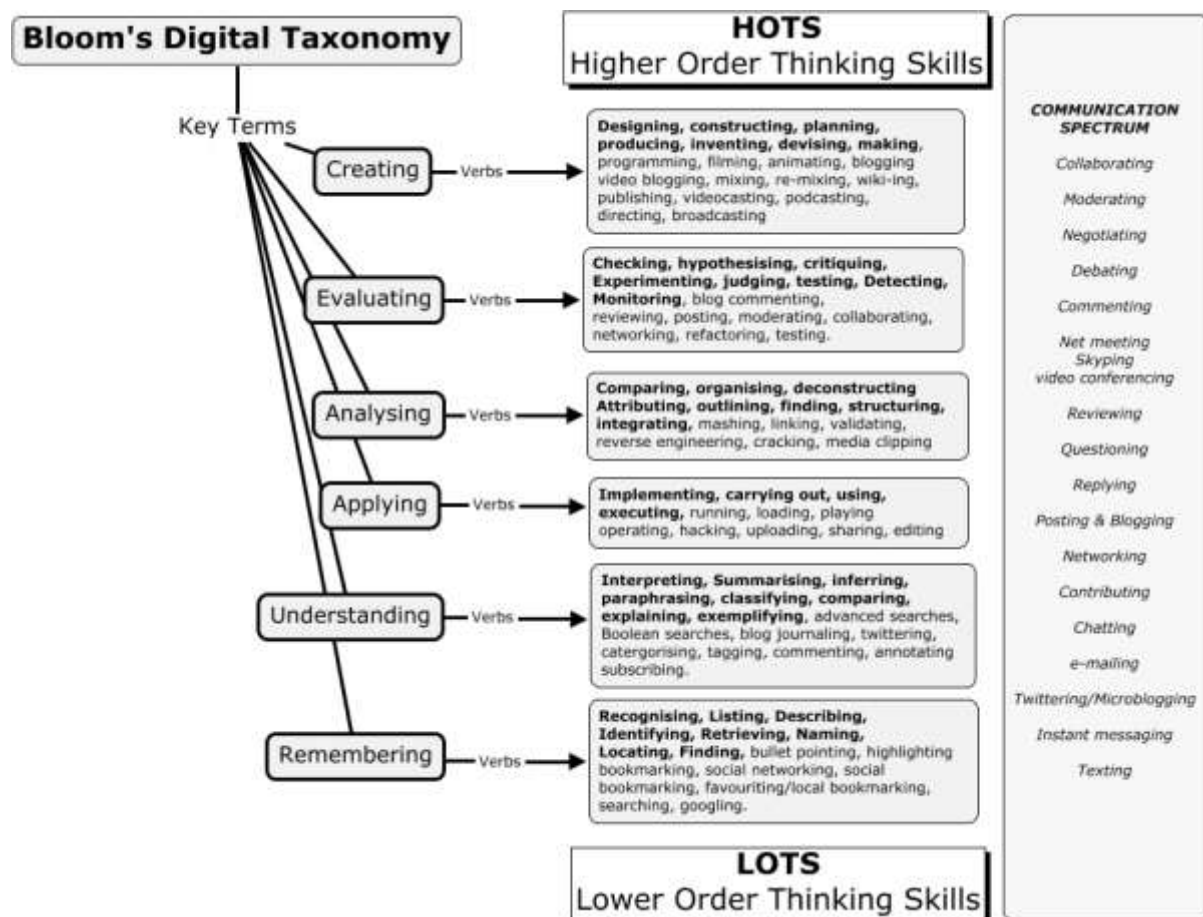


Figure 1: Bloom’s Digital Taxonomy (Churches, 2009)

Given this divide, it becomes imperative for educators to ensure that skills like animating, broadcasting, media-clipping and so on are not confined to I.T.- or media-related courses but included even into Business and Social Science courses like Literature, History and Management. Not least also educational institutions would have to

begin inserting digital literacy (and even mastery?) as a key criteria for faculty selection, appraisal and promotion.

Lecturer training and induction programs (both in-house and externally sourced) must include the Web 2.0 component. KDU College, in fact, began introducing '21st century learning' as part of its 3-month long faculty induction program and also its delivery of the Cambridge International Diploma for Teachers & Trainers (CIDTT) program; many of the participants of this research are ex-students in these two courses.

Next, if Web 2.0, digital literacy and the new learning network paradigms (Albors, Ramos & Hervas 2008) are to be embedded into education, this would render virtually obsolete the idea of the lone learner. Thus, another effect of Web 2.0 is that learning outcomes must include teamwork and collaborative projects, a not entirely unfamiliar trajectory given the rise of multiple-intelligence paradigms emphasizing inter-personal kinds of smart (Gardner, 1993), studies (e.g. by Ward, 2009) which suggests that students' motivation (at least in the case of classroom writing) may *increase* if they're writing to be reviewed by peers or even external professionals and even calls to prioritize collaboration for the sake of human survival (Goerner, 2007).

Collaboration, simply put, is 'two or more' learners working together on a project, assignment or piece of course material with the objective of producing results they couldn't yield alone. It has reaped profound rewards and opened up previously unimaginable opportunities for businesses and for the redrawing of value-boundaries and knowledge objects (Tapscott & Williams, 2006).

Social networking media then is essentially one huge collaborative phenomenon and – risks of 'bad collaboration' (which is worse than no collaboration) aside (see Hansen, 2009) – if learning is to keep in step with Web-based progress, educators and students alike will have to learn how to connect, work and even 'play' well with others, especially in an age where face-to-face meetings are increasingly rare (despite their benefits, see Young 2008) and team members are ad-hoc, impermanent and relate *only* online. Collaboration as a learning (and assessment) activity promotes the all-too-necessary interpersonal element in personal development and knowledge construction, an often neglected element in academia, as reflected in the continued rejection of Wikipedia as an accepted academic reference despite (or because of) its reflection of 'social knowing' i.e. the idea that knowledge is best shaped through a collaborative conversation and not in an ivory tower (Weinberger, 2007).

It was in the spirit of collaborative learning that KDU College, on the suggestion of this writer, became the first educational institution in Malaysia to launch an e-forum for the Ministry of Higher Education (MOHE)'s compulsory subjects or, in Malay, *Mata Pelajaran Wajib* (MPW). The forum enables students reading Malaysian Studies, Moral Studies and Islamic Studies – the three MPW subjects – to experience 8 weeks (more than half of the 14-weeks allocated per subject) of interactive learning.

Given the changes to learning activities and even the priorities of education, it is only natural to question the means and methods of assessment. Web 2.0 should pave the way for more peer-to-peer assessments, real-world problem-based work and cyber-oriented tests of student performance (not to mention lecturer-appraisals). Furthermore, if learning will take place more and more outside traditional classrooms and will involve establishing rich connections to diverse resources and other people (Lankshear & Knobel, 2006) it is only logical that assessments follow suit.

Open CourseWare

From an institutional perspective, the uploading of free educational material by colleges and universities appears to be imminent and is already made popular by universities like Massachusetts Institute of Technology (M.I.T.) (Thomas, 2007), University of Queensland, etc. In Malaysia, however, open courseware remains a rarity and thus a strong marketing innovation option.

The growing availability of open courseware would, however, be simply a matter of time in a century which has seen shifts in the value of knowledge from its relative *scarcity* to the speed and creativity with which people *share* and *use* knowledge which is free. Nowadays, amateur investigators in almost any field enjoy better facilities for free research and analysis than full-time professionals could buy in previous decades." (Coffee, 2001).

The phenomenon of academic material given free of charge to anyone who can get connected to the Internet is but one more expression of a shift to a culture where value resides in and is created by sharing, networking and

collaboration. In this new world, educational institutions who insist of remaining closely protective of and obsessed with 'intellectual property rights' (manifested in, say, a great fear that competitors might steal their work) would not be merely missing the point but also missing out on the competitive edge(s) afforded by Web 2.0

Interestingly enough, at the time of writing, no educational institution in Malaysia has carved out a marketing or strategic position via the use of open courseware.

Research on KDU College

Structure, Strategy and Limitations

Qualitative research was performed on selected faculty (incl. management) and students of KDU College (based in Petaling Jaya, Selangor, Malaysia), which has recently had the honour of being the first college in Malaysia to implement an e-forum for the Malaysian Ministry of Higher Education's (MOHE) *Mata Pelajaran Wajib* (MPW) i.e. mandatory subjects for all pre-university students. The college has also gradually been introduced, via the author's role in its Teaching & Learning Center, to blogging as a learning and assessment tool, not to mention Web 2.0 as a whole.

Questionnaires were used to compile data in an attempt to answer the following questions related to KDU College:

- What benefits and/or challenges have been encountered as a result of the introduction of Web 2.0 applications into teaching and learning?
- To what extent has the e-forum changed the teaching and learning of the MOHE's compulsory subjects?
- To what extent has blogging and other Web 2.0 applications transformed the way lecturers facilitate classes and the way students learn?
- To what extent are the (above) five characteristics of Web 2.0 evident in the college and what issues (strategic, executional, etc.) are being faced or anticipated?
- How should the college as an educational institution in Malaysia act with respect to Web 2.0? What are some future steps foreseen?

The sample participants consisted of 30 staff members of KDU College and 23 students. The questions posed were generally simple with at most four distinctions in attitudes. The limited flexibility is necessary to obtain a more definite, if rather broad, categorization of results. I have also designed the questionnaire in such a way as to 'force' either a positive or negative response (i.e. all contained an *even* number of alternatives) so as to avoid the fence-sitting I feel is very common among Malaysian respondents.

This research was limited in scope by the following factors:

1. The focus is only on tertiary education
2. The focus is only on one educational institution in Malaysia: KDU College, a private institution offering pre-university diplomas, certificates and external programs with institutions from Australia, United Kingdom, Switzerland, etc.
3. Departments within the college vary in size (e.g. less than half a dozen lecturers for Law but about twenty for Hotel) hence the relevance and applicability of the data could be uneven (both across departments and certainly in any attempt to generalize to the Malaysian industry as a whole).

Highlights of Key Findings

Generally, it is unsurprising that overall students were more familiar with Web 2.0 applications than staff. Among faculty, the Mass Communication and Business departments were clearly the more frequent and familiar uses of Web technology and Bloom's digital taxonomy (both scored the highest in the first two categories). Remarkably, the Engineering department scored the lowest overall and is clearly the least responsive to Web 2.0 initiatives and potential.

Interestingly enough, one of the items the students ranked highest – fresh applications for learning – is also the item the staff ranked lowest(!). Could this reflect a greater eagerness of the younger generation of learners for novelty in learning and/or a reluctance on the part of academics to change how they teach? Quite strikingly, the staff too did *not* attach overtly huge relevance/importance to the Web as a source of rethinking learning(!).

It could be said that all the departments are positive about the implications of Web for tertiary education. Notable low-scores were the Hotel school regarding the Web *as a source of fresh learning* applications and the Engineering school on the Web *as a tracking/assessment instrument*.

With the Hotel school this may be expected given the very experience-oriented nature of the hotel and tourism industry – as yet there is no such thing as taking a vacation online. As for why Engineering faculty may not be keen on Web-tracking students' work, one explanation could be the nature of the assessments which usually involves working with electronic equipment, machines, their circuitry, etc.

The results of the management mirror tended to mirror those of the Hotel school (and the Staff's response), in that they were relatively unenthusiastic about new online learning applications. This is a rich item to explore as it raises many questions, e.g.:

- Why a low score *here* when the other categories scored relatively high?
- Were the high scores in the other areas due to the subjective, vague and abstract nature of the issues (e.g. 'rethinking learning', 'participatory learning'), whereas online applications have a definite (albeit virtual) element to it i.e. if the program hasn't been seen yet, then it's best not to be welcoming of it?

The staff was most positive about *collaboration* as a key factor in education, suggesting an openness to non-individualistic forms of learning. This resonates well with the above-par interest in rethinking assessments and the use of the Web in encouraging participatory learning. It is disappointing, however, to note that the overall staff response to *blogging* as a means of facilitating learning isn't enthusiastic.

Among the departments, some notable disinterest included the Pre-University department's take on global connectedness as a definition of learning. The Law department also appeared less than fully interested with embedding a cyber-component into the syllabus and providing free materials online.

Analysis & Recommendations

It needs to be stated from the start that, regardless of occasional concerns and lack of interest, overall both students and staff of KDU College have demonstrated a clearly *positive* attitude towards the Web and Web 2.0 as an instrument for the processing and performance of teaching and learning. If the college is at all representative of the Malaysian tertiary education, then the results would indicate much potential in this direction.

The results at least on the surface suggest that those who have a *higher* propensity to view Web 2.0 as an educationally-transforming phenomenon are also:

- those who spend more time online
- those who are more familiar with social media applications
- those with a *lower* academic qualification (in this case, Bachelor's degree and below)
- those who've worked for *fewer* years in education (in this case, less than 10 years)

Without extrapolating too strongly, based on the survey we could make the following recommendations to better nurture Web 2.0 into the spirit and operations of learning institutions in Malaysia:

- i) The *Media & Mass Communication* departments should **lead the way in embracing Web 2.0** given the greater openness of the faculty to innovative forms of learning and the constant engagement with new media (which is almost by definition what Web 2.0 is). Given the culturally introspective nature of this area of studies and how difficult it is to draw the line between new media as syllabus, as learning activity and as cultural environment, the departments' students and faculty could be perfectly poised to spear-head projects and events which inform, instruct and infuse Web 2.0 into the consciousness of the organization. At this point, it is important to note that a kind of organizational 'action learning' (Rogers, 2007) may be required before productive implementation of Web 2.0 is witnessed.
- ii) The *Pre-University* departments, should educational institutions have one, are also a community well-suited to **support experimentation and development in integrating higher learning with the latest in online social media and technology**. The comparatively less complex and more flexible syllabus may allow greater fluidity in using Web 2.0 applications (although the lesser-trained and generally less exposed students could work against this idea). Nevertheless, the relatively 'shocking' lack of change stimulated by

blogging is a key area to address and if nothing else highlights the critical nature of implementation i.e. people may *say* they have a strong interest in something but unless their eventual (and on-going) experience with the item is productive, positive change might be slow in forthcoming.

- iii) Disciplines which are skill-based, hands-on and which conventionally are *not* drawn towards emerging media (e.g. *Engineering, Hotel and Languages*) will need **longer preparation cum ‘incubation’ time before Web 2.0 is fully accepted**; and whilst it’d be certainly unwise to focus Web 2.0-related path-breaking efforts here, it may help to construct ways in which Web 2.0 applications may be embedded as part of the syllabus. This is to say that, given (what could be) a natural disinclination towards Web 2.0, students and faculty may have to experience its full-blown benefits before being willing to take further steps.
- iv) From the perspective of specific faculty members, without at all alienating the more senior lecturers and professors, the results imply that revitalizing education with Web 2.0 may be an **endeavour best led by the junior members of staff and/or those with fewer years in education**.
- v) From the perspective of the *students*, it may be prudent to **not introduce overly unfamiliar assessment techniques until a later phase**. This is to avoid the anxiety normally associated with passing and excelling in examinations and/or to help ease the transition to new forms of *testing* by first ensuring that students are accustomed to new forms of *learning*.

It must be duly noted that should an educational institution seriously embark on a Web 2.0 mega-project, there will be a need to manage the potential political backlash resulting from various departments and even ‘classes’ of faculty taking the front-seat. Nobody ever said change was easy.

*

Bill Gates, founder of Microsoft, once said that the Internet is the town square of the global village that is our world of tomorrow. If education is to play a key role in shaping the thinking and direction of this global village, this entails that schools and colleges have to do serious business with the Web and all that it offers and represents.

The phenomenon of Web 2.0 is an advent promising transformation for educational institutions willing and able to take bold steps to devise empowering faculty- and student- combinations of experience and experimentation to take their repertoire, *modus operandi* and service-offerings forward in to the future - both real and virtual.

References

1. Albors, J., Ramos, J., & Hervás, J.. (2008). *New learning network paradigms: Communities of objectives, crowdsourcing, wikis and open source*. International Journal of Information Management, 28(3), 194. In ABI/INFORM Global. (Document ID: 1490789221). <https://doi.org/10.1016/j.ijinfomgt.2007.09.006>
2. Anderson, L. W. and David R. Krathwohl, D. R., et al (Eds.) (2001) *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Allyn & Bacon. Boston, MA (Pearson Education Group)
3. Baldi, S., Heier, H., & Mehler-Bicher, A. (2003, September). *Open Courseware and Open Source Software*. Communications of the ACM, 46(9), 105-107. Business Source Premier database.
4. Castells, M. (2004) *Informationalism and the network society*, in Castells, M. (ed.) (2004) *The network society: A cross-cultural perspective*, Cheltenham:Edward Elgar Publishing Inc.d
5. Castells, M. (ed.) (2004) *The network society: A cross-cultural perspective*, Cheltenham:Edward Elgar Publishing Inc.d <https://doi.org/10.4337/9781845421663>
6. Coffee, P. (2001, July 2). *IT IS COMMON KNOWLEDGE*. eWeek, 18(26), 41. Business Source Premier database.
7. Churches, A. Educational Origami, Wikispaces, <http://edorigami.wikispaces.com/>
8. Craig, D *Changing theories of learning*, Seoul National University, in <http://danielcraig.com/publicfolder/Changing%20Theories%20of%20Learning.doc>
9. Dillenbourg, P. (1999) *What do you mean by collaborative learning?* In Dillenbourg, P. (ed) *Collaborative learning: Cognitive & computational approaches*, Oxford: Elsevier.
10. Drumgoole, J. (2006) *Web 2.0 vs Web 1.0*, Copacetic, in <http://joedrumgoole.com/blog/2006/05/29/web-20-vs-web-10/>

11. Fernando, A. (2008, March). *Baby steps in Web 2.0 education*. Communication World, 25(3), 8-9. Business Source Premier database.
12. Flew, T. (2004) *New media: An introduction*, 2nd ed. Oxford: Oxford University Press.
13. Fisch, K. & MacLeod, S. 'Shift Happens 3.0' (available on YouTube), join the Shift-Happens Wikispaces at <http://www.shifthappens.wikispaces.com/>
14. Gardner, H. (1993) *Frames of mind: The theory of multiple intelligences*, Basic Books
15. Goerner, S.. (2007). *Today's Copernican flip: how putting collaborative learning at the hub of human evolution improves our chances of survival*. Systems Research and Behavioral Science, 24(5), 481, in ABI/INFORM Global. (Document ID: 1405147041). <https://doi.org/10.1002/sres.849>
16. Hansen, M. (2009) *Collaboration: How Leaders Avoid the Traps, Create Unity, and Reap Big Results*. Cambridge, Mass.: Harvard Business Press. (2009)
17. Hargadon, S. (2008) *Web 2.0 is the future of education*, in <http://www.stevehargadon.com/2008/03/web-20-is-future-of-education.html>
18. Heuer, C. (2006) *Web 2.0 is a state of mind*, Chris' Insytes, in <http://chrisheuer.blogspot.com/2006/03/web-20-is-state-of-mind.html>
19. Lankshear, C. & Knobel, M. (2005) *Digital literacies: Policy, pedagogy and research considerations for education*, Opening Plenary Address to ITU Conference (Oslo, Norway), in <http://www.geocities.com/c.lankshear/Oslo.pdf>
20. Lankshear, C. & Knobel, M. (2006) *New literacies: Everyday practices and classroom learning*, Open University Press
21. Leteney, F.. (2009, July). *No pain, no gain*. E.learning Age,18. In ABI/INFORM Global. (Document ID: 1807156511).
22. Meister, J. (2008, January). *Three Learning Trends to Watch in 2008*. Chief Learning Officer, 7(1), 54-54. Retrieved August 17, 2009, from Business Source Premier database.
23. NCTE Framework for 21st Century Curriculum & Assessment, NCTE (National Council of Teachers of English), in <http://www.ncte.org/governance/21stcenturyframework>
24. O'Reilly, T. (2006) *Web 2.0 compact definition: Trying again*, in <http://radar.oreilly.com/archives/2006/12/web-20-compact.html>
25. PR Newswire (2008) *New Study Shows Time Spent Online Important for Teen Development*. (20 November), ABI/INFORM Dateline. (Document ID: 1598259561).
26. Prensky, M. (2001) *Digital Natives, On the Horizon*, NCB University Press, Vol. 9 No. 5, October 2001
27. Rogers, J. (2007) *Adults Learning*, Open University Press, Mc-Graw Hill
28. Siemens, G. (2005) *Connectivism: A Learning Theory for the Digital Age*, International Journal of Instructional Technology and Distance Learning, Vol. 2 No. 1, Jan 2005
29. Stephenson, K. *What knowledge tears apart, networks make whole*, Internal Communication Focus, no.36, in <http://www.netform.com/html/icf.pdf>
30. Tapscott, D. & Williams, A. (2006) *Wikinomics: How Mass Collaboration Changes Everything*, London: Atlantic Books
31. Thomas, K. (2007, February). *MIT puts entire curriculum at disposal of e-learners*. Information World Review, Business Source Premier database.
32. Ward, M.. (2009). *Squaring the Learning Circle: Cross-Classroom Collaborations and the Impact of Audience on Student Outcomes in Professional Writing*. Journal of Business and Technical Communication, 23(1), 61. ABI/INFORM Global. (Document ID: 1603220741). <https://doi.org/10.1177/1050651908324381>
33. Weinberger, D. (2007) *Everything is Miscellaneous: The power of the new digital disorder*, Times Books
34. Williams, J., & Chinn, S.. (2009). *Using Web 2.0 to Support the Active Learning Experience*. Journal of Information Systems Education, 20(2), 165-174. ABI/INFORM Global. (Document ID: 1755224761).
35. Young, T. (2008, November). *When face-to-face is the best way to collaborate*. Knowledge Management Review, 11(5), 3. ABI/INFORM Global. (Document ID: 1605260301)
36. Zikmund, W. (2003) *Business Research Methods*, Thomson South-Western

Author contact details:

Alwyn Lau, wwlau@kdu.edu.my

Please cite as: Lau, A. (2012). Web 2.0 as a Catalyst for Rethinking Teaching & Learning in Tertiary Education: A Case Study of KDU University-College (Malaysia). In M. Brown, M. Hartnett & T. Stewart (Eds.), Future challenges, sustainable futures. Proceedings ascilite Wellington 2012. (pp.539-547).

<https://doi.org/10.14742/apubs.2012.1684>

Copyright © 2012 Alwyn Lau.

The author(s) assign to the ascilite and educational non-profit institutions, a non-exclusive licence to use this document for personal use and in courses of instruction, provided that the article is used in full and this copyright statement is reproduced. The author(s) also grant a non-exclusive licence to ascilite to publish this document on the ascilite website and in other formats for the Proceedings ascilite 2012. Any other use is prohibited without the express permission of the author(s).