Pedagogy for a Digital Age: Barriers and Drivers for the Co-construction of Knowledge in Higher Education

Zarina M. Charlesworth
Natalie B. Sarrasin
University of Applied Sciences and Arts Western Switzerland
zarina.charlesworth@heig-vd.ch

Abstract: This paper presents the findings from the exploratory phase of a mixed-methods, multi-phase research project that is evaluating the use of Web 2.0 by faculty and students at two schools at the University of Applied Sciences and Arts of Western Switzerland. Preliminary results from two undergraduate student (n=17) focus groups and a series of semi-structured interviews (n=5) with experienced faculty are presented. In order to provide a pedagogically informed analysis, an adaptation of Dabbagh and Kitsankis' (2012) three-level framework based on that of Zimmerman's (1989) model of self-regulation is used The findings suggest that once the barriers to adoption are overcome educators will have an increasingly important role to play in the co-creation of knowledge. Educators will need to re-evaluate their methods of course delivery and institutes of higher education to rise to the challenge of today's changing society.

Introduction

Today's higher education student has grown up in a world unparalleled to that in which the large majority of educators grew up in. They go by the name of digital natives or netgens due to the ubiquitous nature of the Web as they have always known it. The technological changes that this implies impact every aspect of our lives and call for re-evaluating the manner in which many things are done, including education.

Today's use of the world wide web goes past that of Web 1.0 wich was, and still is, "static, centralised, content-based, readable, rigid and individual" (Hamid, Chang, & Kurnia, 2009, p. 419). What is commonly referred to as Web 2.0 encompasses a range of relatively new technologies that "allow the user not only to read, listen or watch but to contribute as well, whether by adding comments to an existing posting, jointly creating a web page or document or simply chatting in social space" (Armstrong & Franklin, 2008, p. 3). The impact on higher education of such technology is only just making itself felt and in the long term remains still largely unknown. It would seem, however, that a rupture with past and even current practices is inevitable but "the potential transformation of the practices themselves is yet barely understood [and] Higher Education Institutes and their students find themselves in unchartered territories with respect to their use of Web 2.0 technologies " (Armstrong & Franklin, 2008, p. 2).

These technologies, already an ubiquitous part of everyday life, are here to stay. It is imperative that institutes of higher education be open to the idea of using Web 2.0 technologies and the new constructs that come with it. Constructs that can be grouped under the heading of Education 2.0 "with the suffix 2.0 characterizing themes such as openness, personalization, collaboration, social networking, social presence, user-generated content, the people's Web, and collective wisdom, and demarcating areas of higher education where a potentially significant transformation of practice is underway" (Dabbagh & Kitsantas, 2012, p. 4).

As McLoughlin and Lee (2010) so rightly put it, with the growth in Web 2.0 capabilities and applications available to educators "tertiary education institutions are faced with ever expanding opportunities to integrate social media and technologies into teaching, learning and assessment". (p. 29). These opportunities are directly related to Web 2.0's "emphasis on active participation, user generation of content and collaboration [which] seems to fit well with the kinds of creative and critical activities we associate with higher education, with the ways that we know students learn through multiple perspectives, and with the communication and teamwork skills we want our graduates to develop." (Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012, p. 532).

Much of the literature that addresses the use of social media in higher education is concerned with technical issues or focuses on a description of today's digital native and on their expectations. Other articles refer to usage and preference sometimes going so far as to suggest that Higher Education Institutes need to tailor their course delivery to student desire. But higher education is not here to give into student demand for edutainment "a hybrid genre that relies heavily on visual material, on narrative, or game-like formats, and on more informal, less didactic styles of address" (Okan, 2003) but rather "to apply new technologies as a means toward improved learning rather than as an

end in and of itself; that is, to take a pedagogically-disciplined approach to teaching and learning innovation." (Brill & Park, 2008, p. 70).

Pedagogy for a digital age

Most HE institutes today provide some sort of intranet which allows for both students and educators to manage courses, course documents, projects, exams and any course related work or correspondence. These go by various names such as Virtual Learning Environments (VLE's), Learning Management Systems, (LMS's), Course Management systems (CMS) and more recently Personal Learning Environments (PLE's). Implicit in all of these terms is the idea that the student is to take increased responsibility for his / her learning.

There seems to be little discussion about the inclusion of Web 2.0 technologies in such systems, at least at the institutional level, with students and educators oft left to use the systems as best they can and unfortunately reducing such systems to the equivalent of Moodle platforms. In order to integrate such technologies into the personal learning environments of the students in a pedagogically responsible manner it is necessary to look at learning theory. There is, however, a "dearth of research focussing on actual effectiveness of the instructional technological expansion within the classroom (Wynn, 2013, p. 23).

Studies that have examined the theoretical foundations for the inclusion of Web 2.0 technologies in higher education have come from various standpoints. Those that are based on a model of social participation (Bangert, 2009; Hung & Yuen, 2010; Summers & Svinicki, 2007) and which draw on situated learning theory such as that of Lave and Wenger (1991). Others are more firmly anchored in constructivism, constructionism, cognitivism or more recently in connectivism (Conradie, 2014; Siemens, 2004).

The conceptual framework for this research draws on the construct of self-regulation which, according to Nicol and MacFarlane-Dick "is manifested in the active monitoring and regulation of a number of different learning processes: e.g. the setting of, and orientation towards, learning goals; the strategies used to achieve goals; the management of resources; the effort exerted; reactions to external feedback; the products produced." (2006, p. 199). A construct that seems particularly well suited to the co-construction of knowledge through the use of Web 2.0 technologies.

The role of self-regulation in academic learning received much attention starting in the 1980's largely due to the work of Zimmerman (1989). His definition of students who employed self-regulation strategies for learning (1989) was "such students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents or other agents of instruction" (p. 329). According to him (Zimmerman, 1989) self-regulated learning strategies are "actions and processes directed at acquiring information or skill that involve agency, purpose or instrumentality perceptions by learners" (p. 329). Both of these statements are particularly pertinent today.

The three-phase model developed by Zimmerman takes a social cognitive approach to self-regulated learning and draws on Bandura's (Bandura, 1986, 1991) seminal work where the process of self-regulation is seen as impacted by a triad of three factors including personal, environmental and behavioural influences (Zimmerman, 1989). It is noteworthy that these influences do not necessarily exhibit symmetry in strength and that the context in which they occur will impact the function of self-regulation. For example the instructional method may engender more or less self-regulation depending on what is allowed or expected of the student and this both in and out of the school environment. The three phases that Zimmerman (2000) identified were (1) forethought; (2) performance or volitional control; and (3) self-reflection. In the first forethought phase one finds basic activities including task analysis, goal selection, strategic planning. The next phase of performance or volitional control sees the student involved with self-observation and the implementation of self-control processes such as self-instruction, attention focussing and the development of task strategies. The final self-reflection stage includes self-evaluation of performance and self-judgement.

Using Zimmerman's (2000) model as a starting point, Dabbagh and Kitsantas (2012) have described the personnel learning environment of the student using a three-level framework which allows for the inclusion of social media. The three levels they suggest and which mirror to a certain extent those of Zimmerman are (1) personal information management; (2) social interaction and collaboration; and (3) information aggregation and management. Web 2.0 technologies can be called upon in all of these stages and this at both the personal and educative level.

Research Objectives

The first, exploratory phase of this project, has examined the use of Web 2.0 technologies in terms of:

- faculty and student use, personally and for education;
- the identification of barriers and drivers for use in the HE classroom;
- potential practices for pedagogically informed use of Web 2.0 technologies.

The end-objective of this research is to identify how such technologies can be used by educators to better foster self-regulation activities that will allow students to master all levels of this framework.

Methodology

A mixed methods, multi-phase approach is being taken in this research. This paper presents preliminary findings.

Data collection was carried out using two qualitative instruments, focus groups and semi-structured interviews. Two, one and a half hour long focus groups were carried out. The sample was drawn from final semester undergraduate students who were invited to take part in a focus group discussion on the use of social media in higher education. The sample (n=17) comprised students majoring in business administration (n=5), computer science (n=8) and tourism (n=4). The focus groups were both recorded and videoed with the student's permission. Full transcripts were made following the meetings and subject to content analysis.

The identification of several themes allowed for the development of an interview guide which was then used as the basis for 30-minute long semi-structured interviews that were carried out with educators (n=5). The sample was taken from two of the University Business schools and included educators with a range of teaching experience (5 -24 years) in a variety of subject areas. The interviews were all recorded with the participants' approval, fully transcribed and then coded.

An integrated approach has been taken to developing the code structure with an organizing framework for the initial codes (Miles & Huberman, 1994) supplemented by emerging themes that came out through the reading and re-reading of the transcripts. All transcripts were coded individually by the two researchers before being compared. A high degree of consensus on the themes identified was found.

The findings from this initial exploratory stage will serve to develop a quantitative instrument with which to survey the student body of the University of Applied Sciences and Arts of Western Switzerland as well as to its faculty in view of identifying methods of instructional design which answer to the demands of today's students and will be the object of the next research stage.

Findings

Figures 1 and 2 show the social media use by educators and students in the educational and private spheres. Despite the small size of the sample there was a high level of agreement from both the groups. The findings suggest that students and educators are using these types of technologies quite differently with the exception of Moodle for education and Facebook privately. In the case of Moodle the high level of use comes from the institutional policy which more or less imposes its use and in the case of Facebook it would seem that this is a known medium which has now entered the lives of all. Switzerland, with 3.4 million users or 42.8% of the population is right in line with the usage levels found in other European countries as France (42.6%) and Belgium (48.5%) (Studer, 2014).

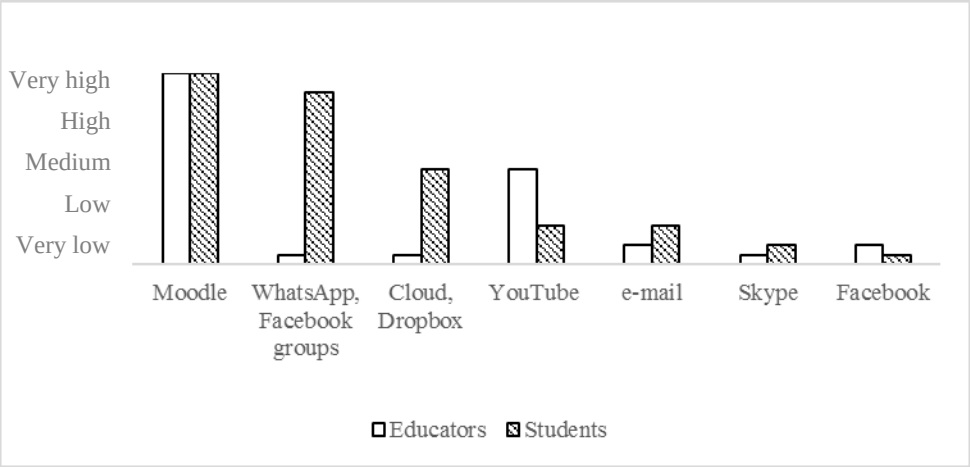

Figure 1: Teaching and Learning : Educator (n=5) and Student (n=17) use of Social Media.

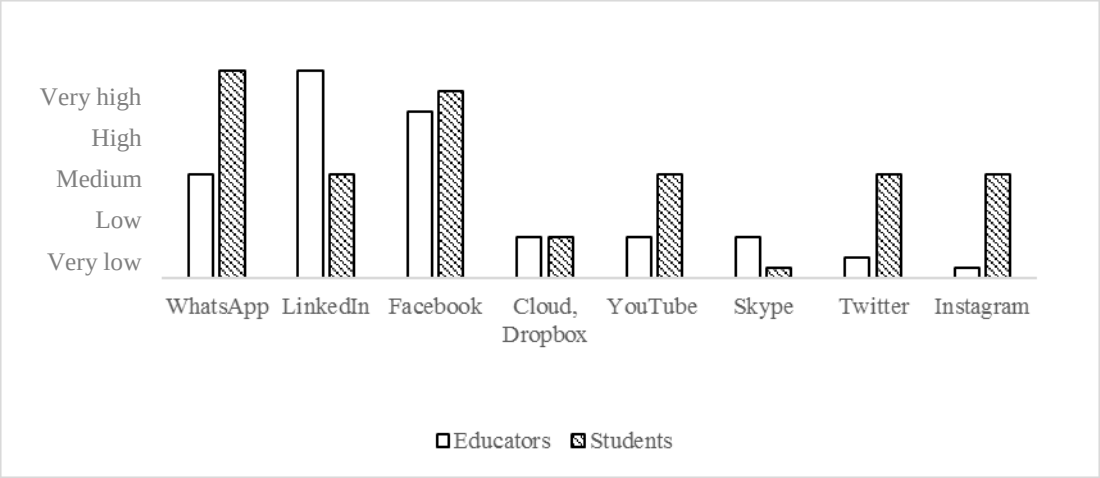

Figure 2: Private Sphere : Educator (n=5) and Student (n=17) use of Social Media.

In order to better understand these findings and adaptation (Charlesworth & Sarrasin, 2014) of the self-regulation models mentioned previously will be referred to. The categories originally put forth by Zimmerman (2000) and revised by Dabbagh and Kitsantas (2012) have been further adapted to reflect the changing situation as we move from a Web 1.0 to a Web 2.0 society and are shown in Table 1.

	Zimmerman (2000)	**Dabbagh and Kitsantas (2012)**	**Charlesworth and Sarrasin (2014)**
	Phase	*Stage*	*Level*
1	Forethought	Personal information management	Organization and searching
2	Performance or volitional control	Social interaction and collaboration	Information exchange
3	Self-reflection	Information aggregation and management	Co-creation and co-construction of knowledge

Table 1: Framework comparison (Charlesworth & Sarrasin, 2014)

Our findings suggest that activities and social media applications for level 1 (organization and searching) are well represented for both the student and educator samples. Level 2 (information exchange) activities see more use by the student sample. Students share easily and frequently and not out of necessity. The educators, on the other hand, are much less inclined to share unless it be for private purposes or for the distribution of course documents via an intranet platform such as Moodle. Level 3 (co-creation and co-construction of knowledge) is a level that was rarely touched upon by any of the participants.

At level 1 WhatsApp is used for organizational purposes alone and almost exclusively by the students amongst themselves. This is not seen as a medium in which the presence of an instructor is welcome. Moving up we see the inclusion of the educator and the use of Moodle and e-mail primarily for exchange of documents and information. On the student alone side Dropbox is also used, once again without the inclusion of the educator. Facebook is situated higher up in level 2 as the information exchange can take the form of an upload whilst chatting often leading to increased exchange. As with WhatsApp, Facebook is situated all the way to the left of the figure as students were very clear about not wanting to open this space up to their instructors. Finally in level 3, the level where one would most like to see the students and faculty evolving one sees little activity. Only YouTube is used, but at a limited rate, by faculty.

Faculty Interviews

Content analysis of the faculty interview transcripts has allowed for the identification of a number of themes which, at this initial stage, have now been reclassified into barriers and drivers for the adoption of Web 2.0 technologies in the higher education classroom.

The main barriers identified include:

- intrusion into the personal space of either the educator, the student or both;
- a loss of communication;
- the introduction of a "third element" into the classroom which is seen as a sort of competition;
- the loss of the physical, meaning body language, eye to eye contact and facial expressions;
- time-consuming;
- a lack of digital fluency on the part of educators;
- institutional disinterest.

Exemplars taken from the interviews are shown below to accurately illustrate faculty perceptions.

Barriers to adoption of Web 2.0

All of the faculty interviewed mentioned a change in the way of communicating with the students which was more frequently seen as negative with the inclusion of a "third party" or a machine in the equation as detrimental. A further impact on communication that is not appreciated is the lack of the physical. As one educator put it:

The non-verbal communication is completely lost. I see students in front of me who are all looking at their screens their hands busy taking notes. I no longer have any information pertaining to their level of attention nor their understanding which was easier to see previously and which provided me with a checklist of how the class was responding and allowed me to adjust my teaching.

They were also unanimous in saying that they were not as digitally fluent as their students and in more than one instance that there was inadequate interest in their adopting new pedagogical models as put by one of the educators:

Today there are 3-4 of us doing things, we try but, whether we succeed or not, no-one is interested. I don't mean to be rude, it's a fact. The institution is like that. A pity really.

Despite the barriers being non-negligible, faculty also had quite a few positive things to say about the inclusion of Web 2.0 in their teaching.

These included the following drivers to adoption:

- involvement of the student in the learning process;
- allows the students to search for information and add to their learning;
- encourages collaborative learning
- provides networking opportunities;
- rapid information access and exchange;
- can add diversity to the course delivery and allow the in class time to be better broken up into various activities;

The most frequent comments relating to the above are illustrated by the two exemplars that follow:

Drivers to adoption of Web 2.0

It's a 20-minute generation, you can talk about something for approximately 20 minutes and then you have to change. You need to break down your teaching, a bit of theory, then a video to illustrate. This allows them [the students] to be far more attentive.

The interest is to have access to a lot of information. I am thinking specifically of YouTube. For me, it's great. Before we worked mostly with articles and made reference to books but now you can come to class with sound tracks and videos which is so much more dynamic and which adds value to the learning experience.

The above suggest that there is willingness on the part of the educators to re-evaluate their methods of course delivery but that they are being held back not only through a lack of commitment on the part of the institutes but also that they are somewhat at a loss as to how to deal with the intrusion of computers into the classroom. Possible responses to this will be discussed in the following section.

One final area, however, that calls for highlighting is that of student needs as seen through the eyes of the educators. Although the sample is small, there was consensus that today's digital natives are not necessarily savvy learners and that the educators still have a very important role to play. What educators felt most strongly about, was their role as coach as shown below:

The danger of digital technology is that they [the students]are not able to distance themselves sufficiently from the subject matter to know what to be interested in. They are drowning in information and they are not capable of synthesizing or being analytic.

It's not only about the technology but also attempting to teach in a way which calls for increased student implication: they put it all together and I am there to support them.

Therefore what they [the students] are looking for y professor is someone who can help them comprehend […] they are not looking for information but for interpretation and understanding.

Discussion

The initial findings suggest that there is a very significant lack of activity on the part of both students and faculty in the co-creation and co-construction of knowledge. Yet it is at this level that students most need guidance and educators have the most to offer.

Figure 3 presents a proposed model with clearly shows the area in which faculty have a role to play. Web 2.0 offers a unique opportunity to add value to the student learning experience.

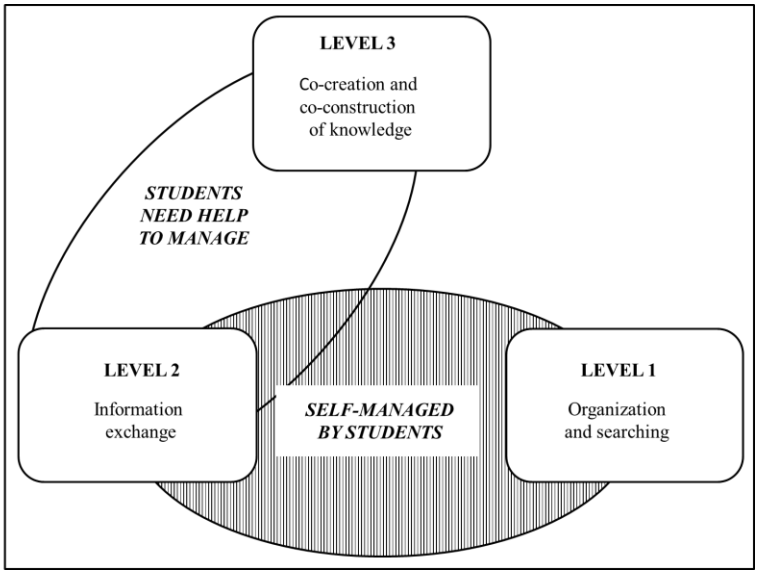

Figure 3: Proposed model for Web 2.0 use in the co-construction of knowledge.

The most surprising of the findings was, however, the clear lack of understanding, especially on the part of the educators of what Web 2.0 implies. It became clear through the interviews that despite the collaborative nature of Web 2.0 and the possibilities available to the educators that most were using the Web 2.0 technology in just a static a manner as Web 1.0. For example rather than have the students create something with YouTube, YouTube is being used to show films. Rather than taking advantage of the interactive component of Web 2.0 to support the co-construction of knowledge, educators seem to be puzzled about how and whether to include students as co-creators in their learning and also seem to be scared of losing control.

As Brown (2012) highlights, academics perceptions of Web 2.0 / social media may indeed "facilitate or inhibit thinking around Web 2.0 use in teaching" (p. 50).

Emerging hypotheses to be tested in the following stage of the research are:

1. Instructional design and course delivery need increasingly to include Web 2.0 technologies.
2. Social media can be used to further learning outcomes through co-creation and co-construction of knowledge.
3. Students of the 2.0 age require just as much educator input to become self-regulated learners.

Conclusion

Educators themselves must embrace new ways of teaching and learning and rather than shy from the pedagogical challenge that they bring and be curious to see how best to integrate change into course delivery.

Faculty will be called upon to re-evaluate their teaching range (Dede, 2013; Kukulska-Hulme, 2012) and as they risk being pushed further and further out of their comfort zone it will be necessary that Higher Education Institutes support this change and development. It will not be enough to simply suggest teaching initiatives and hope that faculty will adhere unless this support becomes visible.

Students will also need to adapt their expectations and contribute to their own knowledge creation.

And finally, this changing world needs to be appreciated as exciting and challenging and one which offers a myriad of possibilities to those willing to explore new horizons.

References

Armstrong, J., & Franklin, T. (2008). A review of current and developing international practice in the use of social networking (Web 2.0) in higher education. UK: Franklin Consulting.

Bandura, A. (1986). *Social foundations of thought and actions:A social cognitive theory*. Englewood Cliffs,New Jersey: Prentice-Hall.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50*, 248-287.

Bangert, A. W. (2009). Building a validity argument for the community of inquiry survey instrument. *The Internet and Higher Education, 12*(2), 104-111.

Bennett, S., Bishop, A., Dalgarno, B., Waycott, J., & Kennedy, G. (2012). Implementing Web 2.0 technologies in higher education: A collective case study. *Computers and Education, 59*, 524-534.

Brill, J., & Park, Y. (2008). Facilitating engaged learning in the interaction age - taking a pedagogically disciplined appraoch to innovation with emergent technologies. *International Journal of Teaching and Learning in Higher Education, 20*(1), 70-78.

Brown, S. A. (2012). Seeing Web 2.0 in context: A study of academic perceptions. *Internet and Higher Education, 15*, 50-57.

Charlesworth, Z. M., Sarrasin, N.B. (2014). The integration of social media in higher education. Manuscript submitted for publication.

Conradie, P. W. (2014). Supporting self-directed learning by connectivism and personal learning environments. *International Journal of Information and Education Technology, 4*(3), 254-259.

Dabbagh, N., & Kitsantas, A. (2012). Personal learning environments, socialmedia, and self-regulated learning:A natural formula forconnecting formal and informal learning. *Internet and Higher Education, 15*, 3-8.

Dede, C. (2013). Connecting the dots:New technology-based models for post-secondary learning. *Educause Review, September/October*, 34-50.

Hamid, S., Chang, S., & Kurnia, S. (2009). *Identifying the use of online social networking in higher education.* Paper presented at the ASCILITE (Australasian Society for Computers in Learning in Tertiary Education), Auckland, New Zealand.

Hung, H.-T., & Yuen, S. C.-Y. (2010). Educational use of social networking technology in higher education. *Teaching in Higher Education, 15*(6), 703-714.

Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning? *Internet and Higher Education, 15*, 247-254.

Lave, J., & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. New York: Cambridge University Press.

McLoughlin, C., & Lee, M. J. W. (2010). Personalised and self-regulated learning in the Web 2.0 era: International exemplars of innovative pedagogy using social software. *Australasian Journal of Educational Technology, 26*(1), 28-43.

Miles, M. B., & Huberman, M. A. (1994). *Qualitative Data Analysis: An Expanded Sourcebook* (2 ed.). Thousand Oaks: Sage.

Nicol, D. J., & MacFarlane-Dick, D. (2006). Formative assessment and self-regulated learning:Amodeland seven principles of good-feedback practice. *Studies in Higher Education, 31*(2), 199-218.

Okan, Z. (2003). Edutainment: is learning at risk? *British Journal of Educational Technology, 34*(3), 255-264.
Siemens, G. (2004). Connectivism: A learning theory of the digital age. *elearnspace* Retrieved January 5th 2014, 2014, from http://www.elearnspace.org/Articles/connectivism.htm

Studer, X. (2014, January, 21st). Facebook: 3,4 millions de Suisses pour 920’000 « Romands » [Web Log Post]. Retrieved from https://www.xavierstuder.com/2014/01/21/facebook-34-millions-de-suisses-940000-romands/

Summers, J. J., & Svinicki, M. D. (2007). Investigating classroom community in higher education. *Learning and Individual Differences, 17*(1), 55-67.

Wynn, M. F. (2013). Student perceptions of technology in the classroom: a faculty and student collaboration. *The Research: An Interdisciplinary Journal, 26*(3).

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329-339.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich & M. Zeidner (Eds.), *Handbook of Self-regulation:Theory, research and applications*. Orlando, FL: Academic Press.