



University of HUDDERSFIELD

University of Huddersfield Repository

Evans, C. K. and Allen, Claire

Undergraduate student research skills for the 21st century: Pedagogical investigation for engaging the millennials beyond surface learning.

Original Citation

Evans, C. K. and Allen, Claire (2012) Undergraduate student research skills for the 21st century: Pedagogical investigation for engaging the millennials beyond surface learning. In: 9th ICED Conference 2012, 23-25 July 2012, Bangkok, Thailand.

This version is available at <http://eprints.hud.ac.uk/id/eprint/15148/>

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

<http://eprints.hud.ac.uk/>

Undergraduate student research skills for the 21st century: Pedagogical investigation for engaging the millennials beyond surface learning.

Authors: Ms Claire Evans and Ms Claire Allen

Abstract

This paper considers the impact of internet search engine retrieval methods on the research skills of the new millennial student. This is a real teaching and learning challenge now being addressed by research educators.

We have identified that art and design students research behaviour centres round feeding the computer search engines and not engaging with primary research. We are at risk of students relying wholly on digitised research as the tools for this exist. If we do not take the lead in developing robust pedagogical approaches in the design of learning digital aides we will find ourselves as educators adapting to embedded/entrenched research behaviour of the new millennials a surface learning model. "Google now channels millions and millions of people to the information they need, on a scale that dwarfs any library, publishing or newspaper effort. The tail (the retrieval system) is wagging the dog to within an inch of its life" (Nicholas, Rowlands, Withey, & Dobrowplski, 2008, p. 5).

Our research seeks to challenge the surface learning of the new millennials. A prominent method is based on emergent learning theory centring round dialogue and interaction between student and educator. This approach of collective enterprise and collaborative learning is no longer tutor centred.

This study presents our research of art and design students. The study looks at comparisons between tutor expectations and student learning experience within the fashion study field. It will investigate ways to engage the fashion student to move beyond the 'attentional' gate of surface learning considering such methods as embed spaces for thinking and reflecting, contributing information, socialising and learning. The study tracks the research process of fashion students and investigates teaching methods to guide them in their navigation through infinite unedited fashion related information.

The discussion will centre round issues we have identified that arise from the student perspective of what is valid research. The research has been carried out with undergraduate students from four courses in collaboration with museum archives over an eighteen month period. The student learning experience has been investigated by observing formal teaching and learning sessions. Evidence was gathered through informal observations, film, questionnaires and interviews in the form of exploratory and qualitative.

The boundaries between socialising and researching are blurring due to Web 2.0 technology. Students focus on feeding the computer search engines and not engaging with primary research. We need to rethink when and where our tutor interventions take place to scaffold the student learning experience and engagement.

Introduction

Imagine this...

"If you need to contact somebody during the day of the museum visit you will have to use the village phone-box!" This was a tutors briefing to students to explain that they would need to be aware that for several hours whilst visiting the museum they would be disconnected from their digital networks (due to remoteness of location). Digital connectivity is increasingly becoming the norm for the millennials. Howe and Strauss (2003, p. 1) describe the millennials as optimistic team-orientated, high achieving rule followers. Jones & Binhui (2011, p. 4) note the most interesting recurrent characteristics of the millennial include core values of community and technology. Those values combined to create a generation that is digitally networked whilst living in the physical in almost all they do.

Rooted in the physical

We live in a physical world a tactile environment that we are connected to; and experience. We make sense of our physical environment by cognitively processing information from our senses. Multiple sensory deficit results in altering our experience of the physical environment but through transference of situated cognition we reconstruct our perception. The disablement of sensory receptors creates cognitive dissonance that becomes the motivator for cognitive and situational learning to re-establish the preferred state off homeostasis. Maintaining a basic state of homeostasis is an instinctive motivator of all living beings. John Dewey in 1934 (2005, p. 12) stated that "the career and destiny of a living being are bound up with its interchanges with its environment not externally but in the most intimate way" the emotions of experience.

The digital revolution is challenging the accepted order of knowledge creation and learning and the reliance on memory. This is a paradigm shift we are tussling with as tutors to reconstruct our teaching practice. We need to embrace the outsourcing of information via digital resources, but develop the transferable skills of retrieval methods the development of the 'what and how to skills' in our students.

Technological advances have always altered our experience and engagement with the physical environment; where once we toiled the soil to feed our family now we log on to a supermarket website bring up our regular shopping list adapt it in minutes and place the order to be delivered; the fundamental outcome is the same we feed our family. We accept that somebody else toils the soil and selects the specific product, we no longer need to have this intimate engagement with the physical environment we have an alternative. What we are not saying is that we are not engaging with our environment but that our engagement and therefore our experience is different; we have more leisure time to engage with the physical environment for leisure based emotional experience. We are in fact employing 'old' knowledge in new ways in response to our current understanding of our relationship with the physical world. If this is an age old problem then what is the specific challenge of today? If as Nicholas David suggests "An internet year is just seven weeks"(Nicholas, 2011,9.55min).The speed of technological change is the specific problem

Fear of 'new to you' technology often results in extreme responses either all embracing and rejection of perceived 'old' technology or rejection of the 'new to you' technology in favour of the 'old' way. It is not as simple as sitting on one side or the other of the argument and defending your stand point your preference is your own but the defensive behaviour of reject and repulsion is in anticipation of cognitive dissonance.

The tools of our age shape our perception and experience of the physical environment. Through this process of shaping we shift our understanding of what is useful knowledge to have and what can be retained in storage should we need it or find a new use for it. Retrieval of knowledge is key! How can we retrieve information/knowledge that we are unaware of and have no memory of? This focuses our learning paradigm to be constructed round interaction and operation of retrieval systems exterior to our situated cognition giving rise to the importance of transference. Engestrom and Cole argue that "issues of transfer become issues of dialogical problem solving, hybridization, and formation of new concepts across boundaries in practice" (1997, p. 307).

The knowledge is inextricably linked to our physical environment either contributing to the order or tools to protect us or helping us to exist. A generation is a product of its environment as Howe and Strauss (Howe & Strauss, 2007, p. 50) explain the "millennials will have more of a knack for cooperation and organisation than for out-of-the-box initiative. They will tend to treat co-workers as partners rather than rivals". Howe and Strauss go on to suggest that if the boomer and x-generations could adapt to the millennial work style then this has the potential to increase economic productivity. It is the boomers and x-generation that are teaching the millennials we need to acknowledge the generation differences and use this to inform where effective intervention can take place. If we can develop as co-workers with millennials then by using a connectionist paradigm with situated cognition creating greater cognitive transference (St. Julien, 1997).

Wired to the digital

Discussions around the impact of digital technology on young learners have been prevalent for decades. Digital technology has had a prominent and irreversible impact on the lives of the millennials, it could be said that they have been digitally wired since birth. Millennials are often perceived as interacting with digital technology intuitively, this continuous interactivity with digital technology has even raised suggestions that it may affect their brains, even suggesting they are becoming hard wired differently as a result (Carr, 2010; Prensky, 2001a, 2001b).

Marc Prensky (2001a) suggests the use of the term Digital Natives to describe this new generation due to their intuitive use of technology, describing the proceeding generation as Digital Immigrants, those who have not known digital technology from birth but are now living and working with it, gaining the skills required to become effective operators. He has gone on to predict a future in which the distinction between the native and the immigrant will change as wisdom seekers become the digitally wise (Prensky, 2009). "Digital wisdom is a twofold concept, referring both to wisdom arising from the use of digital technology to access cognitive power beyond our innate capability and to wisdom in the prudent use of technology to enhance our capabilities." (Prensky, 2009,para.2)

The Millennial generation of student appear empowered by the digital technologies, they may potentially be able to research without entering the library building, communicate without leaving their room and see lectures without meeting their tutor face to face. As Tapscott (2009) points out people can now: 'organize themselves, publish themselves inform themselves and share with their friends-without an authority to instruct them' (Tapscott, 2009, p. 307). Brenda Gourley (2010) explains technology has provided (mostly across the Northern Hemisphere) opportunities to enable widening participation. 'We can harness many minds from many places and cultures and disciplines to focus on the complex and difficult problems of today's world' (Gourley, 2010, Technology section, para.3).

Digital technology will continue to introduce vast quantities of innovative and radically different tools, which the new generations of student will probably intuitively embrace, engage with and react to. Yet Neil Selwyn suggests there is a clear need to maintain a balance 'to approach the digital native literature with caution' (2009, p. 376). 'Adults should not feel threatened by younger generations' engagement with digital technologies, any more than young people should feel constrained by the "pre-digital" structures of older generations' (Selwyn, 2009, p. 376). Rather Selwyn suggests a need to promote grounded portrayals of young people's complex use of technology, for realistic research alternatives to the digital native research discourse.

Signals indicating changes in our students due to current learning tools have been seen (Oblinger, 2003; Prensky, 2001a, 2001b; Tapscott, 1998). Therefore predicting students growing lack of engagement with traditional teaching methods may appear quite obvious. Students constant connection to multi layered quick response digital technology that they can interact with directly; and our teaching methods sit still and listen to the teacher, (Tapscott, 2009, p. 308) appear at odds and cannot be fully engaging and enticing university paying student customers to learn. Brenda Gourley (2010) considering the wealth of online resources and academic roles uses the term 'navigator' to describe the role the academic must now hold. 'The quality of the selected content and the quality of the learning experience and its outcome are consequences of the intervention, not the withdrawal, of the guiding hand of the teacher' (Gourley, 2010, Teaching and Learning, para.4) In order to educate the new learner universities must consider how the new learners are learning and what is engaging them to learn.

The engaging with primary research project

This paper reports on stage 2 findings of an ongoing study across four fashion undergraduate courses total number of undergraduate students 481. The students for this experiment are from year one. The research hypothesis is; if access to digital search engines was removed what effect would this have on student research process.

Aim

The aim of stage 2 was to conduct a controlled experiment gathering cause and effect evidence. The experiment was developed to parallel and validate the initial finding from stage 1. Observations in stage 1 noted that the student approach to the study exercise lacked any formally observed discussion around the groups study methodology. In stage 2 the experiment was adapted to focus on tracking the student research process and methodology with varied levels of tutor intervention. The intention being to evaluate the impact of tutor intervention on student research skills whilst isolated from internet search engines.

Participants

Eighty four undergraduate year one students from the fashion department (from 3 courses) representing 49%, all students belong to the millennial generation. In addition 6 participating tutors, 3 participating museum associates (1 museum staff, 1 archive curator, 1 collection specialist) were engaged in the project.

Methodology

We returned to the museum site used in Stage 1 of the project. The museum is situated in a remote place by the North Yorkshire Moors, England where there is no access to the wireless internet or mobile signal. This site was critical to the experiment as it provided an environment that could be controlled, preventing access to internet resources and mobile communication.

Students were put into groups ensuring representation from all three courses in each group, with eight or nine in each. On site at the museum we had arranged to split the groups across two locations that we will call A&B.

On arrival staff were split into two teams one for each study area:

- Staff team A in study area A with tutor intervention: None of the staff had been to the museum before, they were all briefed to identify one group to work with closely acting as a co worker and a second group to advise and support (tutor supported) but not to act as a co worker. All selected separate groups in their location. We recognise that having tutors operating to slightly different directions for the 2 types of study groups in location A did mean that the tutor supported group were going to have degree of influence on their behaviour from being in close proximity to the co-working groups.
- Staff team B in study area B with no tutor intervention: The staff were briefed to be on hand when students needed support (unsupported). The staff team were deliberately briefed not to be co workers. This was to allow for a control group operation under equal conditions to those operated in stage 1 of the experiment.

All staff and students were presented with the same project brief on the day. The museum associate floated between the two study areas.

Evidence was gathered on the day through observations by 2 researchers, 1 in each location. This research was then analysed at half hour intervals (records of snap shots of student conversations and photographic evidence). This was followed up five days later with groups presenting their research work. After presenting the work student groups took part in an informal semi structured interview this was filmed. The influence and bias imposed on the 2 different types of study group in location A was managed by analysing both the student conversations and work they finally presented.

Research findings

The findings from the experiment have been divided into three areas methodology, research and engagement with observations of each of the three intervention study groups (Figure 1). Post research day evaluation presents findings on student group communication during 5 days to final submission and the final submission observations (Figure 2).

Project Part 1 Research day without digital resources			
Intervention study groups	Co-worker	Tutor supported	Unsupported
Methodology	-Methodology discussed with focus on investigating the objects	-Methodology focused on outcome	-Methodology focused on outcome to get the job done
Research	-Recording observations mostly by sketch and note taking some purposeful photography took place	-Sketching but not close up inspection of object some photography	-Photographing objects continued throughout total period -More passive approach to taking information given
Engagement	-Engagement in the study maintained for 2 hours	- Engagement in the study maintained for almost 2 hours -Students more static and quieter than other groups in location A -Social chat observed after half an hour	-Engagement lost after 1 hour with half the group wandering off about the museum. -Students chat moves from focus over outcome to social chat after an hour

Figure 1. Project Part 1 Research day without digital resources

Project Part 2 Post research day final presentations and feedback			
Intervention study groups	Co-worker	Tutor supported	Unsupported
Communication	-All communicated via	-All communicated via	-All communicated via

	Facebook	Facebook	Facebook
Final submission observations	-Depth of research informing practice -Research informed by secondary research	-Recorded objects placed in front of them -Research informed by secondary research	--Recorded objects placed in front of them -Research limited to on the day findings

Figure 2. Project Part 2 Post research day final presentations and feedback

Summary of findings

Without the presence of the internet and digital learning resources the constructed experiment sort to investigate the impact of tutor interventions on the primary research investigation process.

Stage 1 identified certain behavioural traits in student participants:

- computer first behaviour – digitise it first, investigate later, the myth that digital information must be correct
 - time - the tendency to rush, the perception of being time poor
 - the blurring of boundaries between socialising and researching
- (Allen & Evans, 2011)

Stage 2 presented in this paper focused on understanding the impact of tutor intervention.

Methodology

Students working in the groups as co-workers with tutors developed clearer strategies for investigating the set of objects and considered the methodology in relation to their individual study perspectives. Student comment: "I like to start with something I see myself" referring to handling the object.

Tutor supported and unsupported groups focused their discussions about their methodological approach around the outcome and the ease in which they could achieve this 'to get the job done' (Figure 1) Student comments: "We don't need to spend much time on this!" "Then that can be the easiest thing we can do at the moment"

Research

Clear differences were observed between the co-working groups and the tutor supported and unsupported groups in that without direct intervention the students were quick to photograph the object (Figure 1) Student comments: "I am taking a photo of this so I know what it is", "Found an interesting page, I will take a picture of it" this is the same 'snap happy' behaviour noted in the previous experiment in stage 1 (Allen & Evans, 2011). One student in location B was observed taking photos of a museum information panel in sections to read it later on the computer.

Students in one of the tutor supported groups were heard saying "No point in doing what we don't have to" however the work ethic was maintained by all groups in location A for a significantly longer period this suggests that whilst the student methodology of the Tutor supported groups was closer to the unsupported groups they were influenced to study for longer because of the work ethic of the co-working groups.

Engagement

Engagement differences were significant; students in both co-working groups and tutor supported which were based in the same location (location A) studied intently for 2 hours compared to 1 hour by the unsupported group. This is an indicator of the engagement and the impact of tutor intervention (Figure 1). When the archive curator entered location A, after 1 hour of being in location B, he exclaimed "looks very industrious in here!" There was a clear difference observed between the study focus in the two locations.

Post research experiment - Self directed study

Looking at the student research project outcomes there is evidence to suggest that where tutors co-worked with students the student's developed research that was of a greater depth and even showing signs of informing their own practice (Figure 2). Students in the co-working groups were more inclined to study the objects in detail using different methods to record their observations, where as those in the unsupported groups photographed objects to draw later; if they worked on them at all (Figure 1).

In the interviews all groups said they communicated via 'facebook' (social networking website) and did not meet up again until just before the presentation. When asked what further research they had done if any, the response was 'internet' from all. One student said "I 'Googled' but I couldn't find anything on overlocking so perhaps it was called something different" Others explained they drew from the

images they took. The students in the unsupported groups submitted work that they had completed on the day of the museum visit. Some even said they hadn't had time to research further.

Where tutors co-worked with students, the students were able to make better connections with the objects. In the following days that provided a period for further research and reflection some of these students were able to connect their primary research to possibilities and ideas for their own practice.

Discussion and Conclusion - Creating the Future together

Universities see their boundaries with the wider world blurring due to technical, economic and environmental development. Universities work within the realms of what is coined by Ronald Barnett (2000) as 'supercomplexity'. It is a higher order complexity in which we have to find ways of living and even prospering, if we can, in a world in which our very frameworks are continually tested and challenged' (Barnett, 2000, p. 76). Universities have learnt to understand and manage amid supercomplexity but they need to continue to recognise and respond to the value structure that allow for this (Barnett, 2000, p. 83). As the world in which our graduates will work, will be not only supercomplex, but rapidly changing, they need adaptable skills and the motivation along with the ability for transference of knowledge. Neil Selwyn (2011) has suggested that 'digital technology often turns out to be more a problem changer than a problem solver. So understanding the notion of 'change' should be another key element of engaging fully with education and technology' (Selwyn, 2011, p. 55).

Today's students live their lives in the physical whilst being almost constantly attached to the digital. They progress along learning life lines finding themselves constantly fluxing on a motion pendulum that swings between digital and physical experiences. As Dewey (2005, p. 12) states "the career and destiny of a living being are bound up with its interchanges with its environment not externally but in the most intimate way" the emotions of experience. As Howe and Strauss (2007, p. 47) suggest the millennials are a hero generation that grow up protected. Protected children which question less and are more risk adverse than other generations. The research presented in this paper together with earlier research in stage 1 (Allen & Evans, 2011) indicates that this affects their enquiring minds in the research process they are much more reliant on digitised information even so far as saying they digitise things they see to validate they have seen it. It is the secondary digital information that they then work from to make an observation investigation.

In the research experiment we can see that even with small study groups students benefit greatly from tutor intervention, with it helping them investigate to a greater depth physical objects. Left unsupported they instinctively 'digitise' the object to prove they have seen it, then work independently away from tutors working from the digitised image. With tutor intervention there is purpose to the digital photography they are considering what and why before taking the picture and considering how this might fit with study notes and visual sketch enquiry.

We now need to consider how the wisdom of each generation can be capitalised on. The millennials being the digitally wise bring their experience of the digital environment and the preceding boomer and x-generation who we suggest are the physically wise, bring their experience of the physical environment.

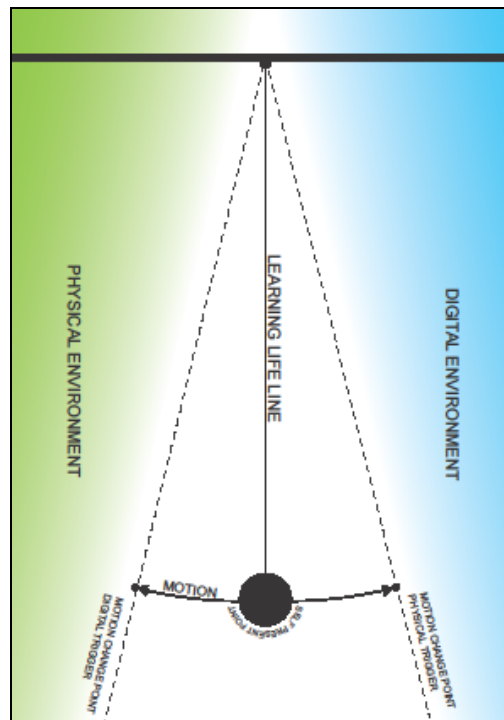


Figure 3. Learning pendulum.

If we consider a notional pendulum of learning that needs to maintain a momentum to cope with the ebb and flow of our digital and physical environments. In order to make sense of our world and maintain a state of homeostasis we need to maintain this momentum. As tutors we can affect that momentum for our students and slow it down, we illustrate this with our learning pendulum model (Figure 3). The research shows the students instinct for digital, and to digitise if it is not digital, the momentum here is fast. As the pendulum changes direction there is a pause point where we suggest is the opportunity for tutor intervention, to alter and slow down the momentum. This period is a natural point for reflection but needs to conclude timely with direction for what to look for, or engage with, in the digital to bring back to the physical for reflection, discussion and critical thinking. The pause point in the digital can have exactly the same impetus by reflection on what has been done in the digital environment, this too could be an intervention point but digitally based. By constructing pause-points where intervention can take place we can stimulate the cognitive processing and develop greater depth of enquiry and investigation in both the physical and digital environments.

We should not be afraid of the students' digital wisdom but if we co-work with them as their preference is for collaboration and co-working, then we can guide and develop their enquiring mind as they can digitally educate us the tutor. The student engagement conflict lies in the clash of the generational teaching and learning methods. Students' live in a fast paced multifaceted digital world they cannot sit still and listen, nor do they want to. Their motivation is to get in and get out quick as we observed with the digitising of objects. If we can overcome the fear of the generations (which is natural) and come together in collaborative learning, the sum of the outcome can be greater than its parts.

References

- Allen, C., & Evans, C. (2011). Going beyond the obvious: Engaging fashion design and reflection and self motivated investigation. *3rd Global Conference Fashion Exploring Critical Issues*. Retrieved from <http://eprints.hud.ac.uk/11168/2/Allenpdf.pdf>
- Barnett, R. (2000). *Realizing the university : in an age of supercomplexity*. Buckingham: Society for Research into Higher Education & Open University Press.
- Carr, N. G. (2010). *The shallows : how the Internet is changing the way we think, read and remember*. London: Atlantic.
- Dewey, J. (2005). *Art as experience*. New York: Perigee.

- Engeström, Y., & Cole, M. (1997). Situated Cognition in Search of an Agenda. In D. Kirshner & J. A. Whitson (Eds.), *Situated cognition : social, semiotic, and psychological perspectives* (pp. 301-309). Mahwah, N.J. ; London: L. Erlbaum.
- Gourley, B. (2010). Dancing with History: A Cautionary Tale. *EDUCAUSE Review*, 45(1), 30-41.
- Howe, N., & Strauss, W. (2003). Millennials Go To College. *Executive Summary*. Retrieved from <http://eubie.com/millennials.pdf>
- Howe, N., & Strauss, W. (2007). The Next 20 Years: How Customer and Workforce Attitudes Will Evolve. [Article]. *Harvard Business Review*, 85(7/8), 41-52.
- Jones, C., & Binhui, S. (2011). The Net Generation and Digital Natives: Implications for Higher Education. *Higher Education Academy*, 1-53. Retrieved from <http://www.heacademy.ac.uk/assets/documents/learningandtech/next-generation-and-digital-natives.pdf>
- Nicholas, D. (2011). Implications of the digital transition for libraries [Film of presentation]. *Biblioteksdagarna 2011*. Retrieved from http://ciber-research.eu/CIBER_news-201112.html
- Nicholas, D., Rowlands, I., Withey, R., & Dobrowplski, T. (2008). The Digital Consumer: an introduction and philosophy. In D. Nicholas & I. Rowlands (Eds.), *Digital Consumers reshaping the information profession* (pp. 1-11). London: Facet Publishing.
- Oblinger, D. (2003). Boomers & Gen-Xers Millennials: Understanding the new students. *EDUCAUSE Review*, 38(4), 36.
- Prensky, M. (2001a). Digital Natives, Digital Immigrants Part 1. *On the Horizon*, 9(5), 1-6. doi: 10.1108/10748120110424816
- Prensky, M. (2001b). Digital Natives, Digital Immigrants Part 2: Do They Really Think Differently? *On the Horizon*, 9(6), 1-6. doi: 10.1108/10748120110424843
- Prensky, M. (2009). H. Sapiens Digital: From Digital Immigrants and Digital Natives to Digital Wisdom. *Innovate: Journal of Online Education*, 5(3).
- Selwyn, N. (2009). The digital native – myth and reality. *Aslib Proceedings: New Information Perspectives*, 61(4), 364-379. doi: 10.1108/00012530910973776
- Selwyn, N. (2011). Education and digital technology: the need for social realism? . *Educational Technology*, 54-56. Retrieved from <http://www.scribd.com/n.selwyn/d/67419354-Education-and-digital-technology-the-need-for-social-realism>
- St. Julien, J. (1997). Explaining Learning: The Research Trajectory of Situated Cognition and the Implications of Connectionism. In D. Kirshner & J. A. Whitson (Eds.), *Situated cognition : social, semiotic, and psychological perspectives* (pp. 261-280). Mahwah, N.J. ; London: L. Erlbaum.
- Tapscott, D. (1998). *Growing up digital: The rise of the Net generation*. New York: McGraw-Hill.
- Tapscott, D. (2009). *Grown up digital: How the Net generation is changing your world*. New York: McGraw-Hill.