TEACHER DEVELOPMENT IN THE DIGITAL AGE

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Abstract

Within the rapid changes in communication techniques, culture, pedagogy, and developments in knowledge, it is vital that educators are familiar with new educational changes, mainly those changes which are connected to technology. Change can be accompanied by fear, and thus some teachers might resist changing (Fullan, 2006). In the digital age, some teachers might be reluctant to change because they feel they are immigrants in the digital world (Prensky, 2001). In developing countries, such as Algeria and Libya, teachers might feel more frustrated because of the digital gap in their countries and because of the digital gap with the students (Warschauer, 2003).

This conceptual paper aims at exploring the main factors that inhibit teachers from change. This paper focuses on teachers from k- to college teachers in general. The rationale behind dealing with teachers in general, and not teachers of a specific discipline is to explore the way teachers in low technology areas could see their development from a digital perspective. It is also assumed that digital education is needed in all fields of education as there are already policies about the integration of technology in education (Hamdy, 2007).

In the context of this paper, change is defined as switch from Mindset 1 to Mindset 2. Educators with Mindset 1 consider the digital age as an extension of the industrial world; whereas educators with Mindset 2 believe the digital age is a post-industrial era, and the changes that are happening should be approached as new.

Keywords: digital education, digital immigrants, digital natives

1. Introduction

In his argument about change, Fullan (2006) claimed that if people were asked what change meant, they would use negative and positive terminologies such as *fear*, *danger*, *anxiety* or *excitement*, *improvements*, and *energizing*. Fullan (2006) defined teacher development as the process "to develop new insights into pedagogy and their own practice, and explore new or advanced understandings of content and resources" (329). According to the definition,

development is perceived as change. With the deictic changes in information, communication, and technology, the role of teachers is changing and becoming more important in a way that educators have to think about teaching students who are eager about technology use (Leu, Kinzer, Coiro, & Cammak, 2004).

However, some teachers fear change, and so they hold on to traditional teaching (Peterson,1999). Traditional teaching is based on a top-down process, where the teacher is the knowledge provider, and he/she goes into class with a lesson plan that has been designed by the teacher. In the information age, teachers are for the first time preparing students for a future they cannot clearly describe and the learners' ability to use technology exceeds the teacher's ability (Warlick, 2001).

Thus, some teachers fear the use of technology because they see themselves as digital immigrants, whereas their students are digital natives (Prensky, 2001). Rosen (2010) argued that teachers' fear of change is not connected to digital tools only, but also that teachers are worried about the neurological, social, and psychological effects of students' overuse of technology. Zur and Zur (2011) described teachers' fear of change in the digital age as a nonacceptance of some teachers that the digital age represents a new era. As a result, Lankshear and Knobel (2003) argued, there is a tension between two mindsets within the framework of the digital rise. The first mindset, called Mindset 1, assumes the digital revolution is just an extension of the industrial revolution. On the other hand, Mindset 2 assumes the world is now totally different from the way it was 30 years ago in terms of thinking and doing. Teachers with Mindset 1 believe there is no urgent need for a change of the educational model and they resist change. Teachers might think they do not need to change, as they succeeded without the digital tools. Change might be more difficult for teachers living or teaching where the digital development has just started to emerge, such as developing countries. As Guemide, Benchaiba, & Bouzar (2012) explain, e-Educators in developing countries are frustrated with two types of digital divide: the digital divide between developed and developing countries, and the digital divide between students and teachers.

Teaching digital natives is not without constraints and potential worries, but if students use *Wikipedia* instead of using the library books, teachers should not be alarmed (Rosen, 2010). Change is not unknown to teachers, as they constantly change in terms of teacher development (Freeman, 1989). However, the change within the digital age requires a switch from Mindset 1 to Mindset 2, and the change might be difficult for some teachers as there is tension between the

two conflicting mindsets (Lankshear and Knobel, 2003). The fear of not being able to change because of the digital divides is not related to tools or students, but is connected to teachers themselves (Prensky, 2001, 2012; Warlick, 2001). Not all teachers are digital immigrants, and not all students are digital natives (Zur and Zur, 2011). The constraints are connected to the relationship students and teachers have with technology and the digital gap is a "humanware" issue, which means the gap is related to humans, issue rather than a software issue (Warschauer, 2003). This conceptual paper aims at exploring the way the digital natives and digital immigrants dichotomy is connected to attitudes, and not to age. The paper also aims at exploring the way in which teachers could switch from Mindset 1 to Mindset 2 because their fears are unjustified (Dweck, 1999).

2. Technology use in developing countries

There is a need for teacher digital development in developing countries, such as Algeria and Libya. The two countries are located in North Africa, and they are, like most African countries, putting a strong focus on technology because an "information society is perceived as a chance for Africa, a chance to blend into a world of economic opportunities and social well-being" (Alzouma, 2005, p. 340). In Algeria, digital development is slow, but has been improving since 2000. The national Algerian regulator responsible for Arabic digital content is the Research Center on Scientific and Technical Information (RCSTI), a public scientific and technological research center focused on the Internet market. Digital ICT education has been included in the program of education reforms that started in 2001, and technology is perceived by policy makers as the key to success for a modern country. According to Hamdy (2007), to facilitate Algeria's entry into the information society, the following national Information Technology and Communication (ICT) initiatives were designed by the government (Hamdy, 2007 ,p.4)

- The Ministry of Education's project to equip all schools with computers by 2005
- The distance education project, a project to enhance online education
- A research network to be put in place by the Ministry of Higher Education and Scientific Research (p.4)

In Algeria, there is a clear policy about the importance of digital education in Algeria, but as Guemide, Benchaiba, and Bouzar (2012) argued, the fragility of the system has "teachers remain[ing] confined to traditional teaching" (p. 9). In Libya, education depends on the teacher as

information provider, but Egbert, El Turki, El Hussein, and Muthukrishan (2012) observed that "young people are good at using multimedia and digital tools with little formal training" (p. 4). There is no formal policy about digital education in Libya, but young people use technology. In the Arab Spring in 2011, social media (e.g., Facebook, Twitter, and YouTube) were used to deliver information (Egbert et al., 2012). Digital growth appears to be slowly developing in African countries like Algeria and Libya, and teachers' fears might be understandable. However, the change is not only connected with the availability or non-availability of digital resources, it is also connected to the attitudes teachers have toward digital literacy (Warschauer, 2003).

3. Teachers and digital literacy – digital natives and digital immigrants

Most teachers enjoy teaching the content they are familiar with and teachers usually view themselves as teaching things which are unknown to students (Shulman, 1987). Teachers view themselves as experts in the content knowledge they have acquired. Being knowledge providers is a definition teachers want to relate to in their education world (Peterson, 1999). Teaching has long been based on a one-way method where teacher knowledge is central in education (Tsui, 2009). Top-down teaching makes some teachers feel comfortable and safe when they orchestrate the classroom (Freeman, 1989). With the emergence of digital literacies, teachers' role is changing, and teachers have to be aware of the complex contexts for literacy (Leu et al., 2004). Teachers have the challenge of dealing with students who "are coming to school more literate in the new literacies of ICTs than their teachers" (Chandler-Olcott & Mahar, 2003, p.361). Thus, teachers need to rethink their roles in an educational context that is constantly changing with more resources and tools, where learners are familiar with using those tools inside and outside school (Lankshear & Knobel, 2011). Within the frame of digital literacies, teachers are required to be facilitators rather than knowledge providers, while learners are no longer consumers of knowledge (Cummins, 2007).

To cope with the digital age, teachers should understand that 21st century learners have different ways of thinking and different practices which are closely connected to technology (Leu et al., 2004; Warlick, 2001). Teachers may not be comfortable with the digital tools, which would create a gap between them (digital immigrants) and the students who are more comfortable with digital tools (digital natives – Peterson, 1999).

      Digital native refers to people who were born after 1980, whereas *digital immigrant* refers to those who were born before the digital revolution (Prensky, 2001). Feeney (2010) argued that the gap between the two groups has nothing to do with birth, but with how the two generations think (Figure 1).
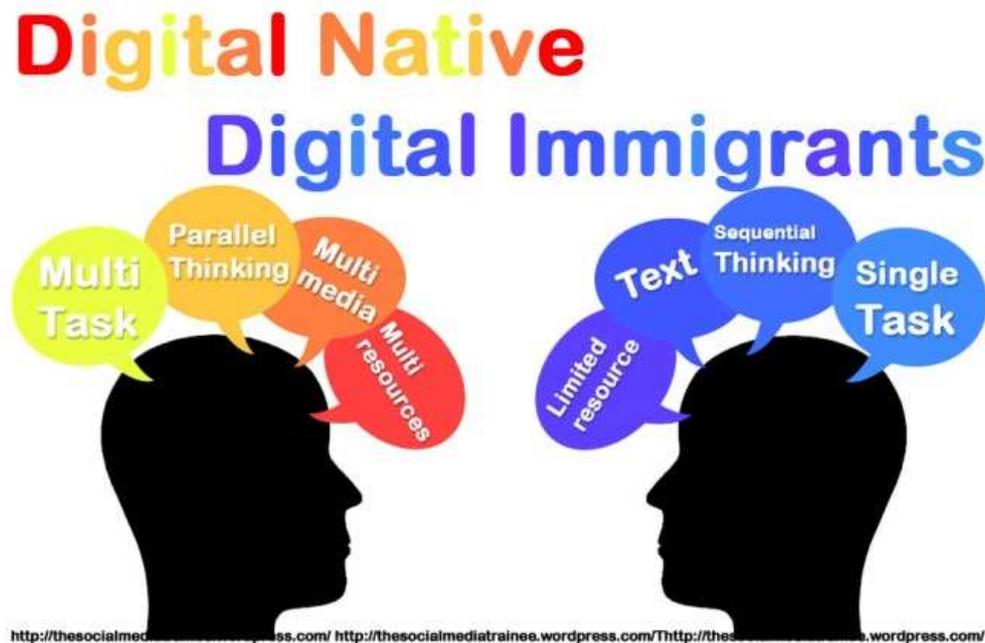
      According to Prensky (2001), digital natives are born surrounded by digital media; thus, their brains might function differently. He describes their digital natives' practices as follows:

> Digital Natives are used to receiving information really fast. They like to parallel process and multi-task. They prefer their graphics *before* their text rather than the opposite. They prefer random access (like hypertext). They function best when networked. They thrive on instant gratification and frequent rewards. They prefer games to "serious" work.
>
>   (Prensky, 2001, p. 1)

      Prensky (2001) asserts that students not only have different patterns of thinking, but they have different practices, which are sometimes totally unknown to teachers. Prensky's description of teachers as digital immigrants has been criticized. Bennett, Maton, and Kervin (2008) asserted that Prensky's construct of digital native/digital immigrant put teachers and students onto two different poles with a gap between them that cannot be bridged. They also indicated the lack of evidence about whether multitasking is effective for learning. They asserted that Prensky's

dichotomy is based on the determination that teachers are not able to change because of age. Prensky (2012) supported this assertion with evidence from neuroscience and social psychology claiming that students' and teachers' brains were different. In contrast, Rosen (2010) addressed teacher change in terms of worries about the neurological effects of multitasking and the loss of face-to-face social skills. She addressed the need for teachers to change in a way that serves students' digital habits of learning (e.g., the use of social media). Prensky (2001), Bayne and Ross (2007), and Rosen (2010) agreed that the differences between digital natives and digital immigrants were in terms of thinking and doing. A summary of the differences between digital natives and digital immigrants would be as follow:

Table 1. Digital Natives vs Digital Immigrants.

Digital Natives	fast
	young
	future
	multi-tasking
	mage
	playful
	looking forward
	digital
	action
	constant connection
Digital Immigrants	Slow
	Old
	Past or 'legacy'
	Logical, serial thinking
	Text
	Serious
	Looking backward
	Analogue
	Knowledge
	Isolation

The digital native and digital immigrant dichotomy is still a debated issue. As Harding (2010) stated, "An oft-discussed topic in education right now is whether students who have

grown up with computers and the Internet learn differently than earlier generations" (p. 1). In an influential research study, Zur & Zur (2011) deconstructed the dichotomy within each generation, and not between them. They stated, "Like digital immigrants, digital natives are also not created equal. Digital natives are also diverse in terms of their attitudes, and capacities regarding digital technologies" (p. 1).

Zur and Zur (2011) laid out the differences into categories and digital immigrants are categorized as follows:

- **Avoiders**: Their use of technology is limited and they are not interested in social media tools.
- **Reluctant adopters**: They have their own cell phones and computers, and they try to engage with it, but they still feel strange toward it.
- **Enthusiastic adopters**: The digital immigrants who embrace technology and immerse themselves in the Internet culture.

On the other hand, digital natives fall into three categories:

- **Avoiders**: Youngsters who were born digital, but do not feel an affinity for digital technologies.
- **Minimalists**: They know that technology is a part of today's world, but they use it when necessary.
- **Enthusiastic participants**: Digital natives who enjoy and thrive on technology and gadgets. This group is harder to reach on the phone than via online methods and texting (p. 3).

4. Heading for change – from Mindset 1 to Mindset 2

According to the Free Online Dictionary, mindset is a "fixed mental attitude or disposition that predetermines a person's responses to and interpretations of situations". Hamilton et al. (2010) defined *mindset* as "a workspace in which other processes, including goal-directed ones, operate" (p. 2) and the mindset theory is based on the assumption that individuals are able to switch their mindsets. Individuals have the ability to implement multiple mindsets, depending on "their motives or situational demands" (Dweck, 1999, p.18), which means that people can be categorized under a scale in terms of where their hidden views and abilities come from. Dweck

(2006) distinguished between two kinds of mindsets, fixed mindset and growth mindset. She gives the following definition:

> In a fixed mindset students believe their basic abilities, their intelligence, their talents, are just fixed traits. They have a certain amount and that's that, and then their goal becomes to look smart all the time and never look dumb. In a growth mindset students understand that their talents and abilities can be developed through effort, good teaching and persistence. They don't necessarily think everyone's the same or anyone can be Einstein, but they believe everyone can get smarter if they work at it. (p. 89)

In other words, Dweck (2006) argues that people with a fixed mindset believe ability is inherited and cannot be developed. People with a growth mindset believe they can change, even if they take risks.

Within the digital frame, Lankshear and Knobel (2003) made the point there is a tension between two distinct mindsets regarding the effect of Information and Communication Technology on the contemporary world. As the authors explain,

> The world is being changed in some fairly fundamental ways as a result of people imagining and exploring how using new technologies can become part of making the world (more) different from how it presently is (second mindset), rather than using new technologies to do familiar things in more "technologized" ways (first mindset).

> (Lankshear and Knobel, 2003, p. 34)

According to Lankshear, and Knobel (2003), people with Mindset 1 believe digital era is just an extension of the industrial world; whereas the people with Mindset 2 view digital age as something new. The switch of mindsets is defined within this paper as the change of teachers' attitude toward digital technology, and this change of attitude might lead to change of thinking and practices. Teacher development is not only a change of attitudes, but a change of practices, as suggested by Fullan (2006).

Teachers in developing countries might be resistant to change because of the gap related to the availability of digital tools (digital divide), and the gap related to teachers who feel like immigrants in the digital world. Warschauer (2003) addressed the issue of digital divide, arguing the resistance to using technology in teaching is more connected to a lack of humanware rather than a lack in software. Warschauer (2003) posited that developing countries spend huge sums of money to purchase hardware, but do not focus on teacher development.

However, not all teachers are resistant to digital education because it depends on the way they view technology. As mentioned earlier, teachers as well as students fall into different categories within the digital frame. For digital teacher development to be successful, it is important for teachers to understand which category they fall in (avoiders, reluctant adopters, or enthusiastic adopters). By knowing that, teachers can determine their attitude toward technology, and can decide if they are able to switch from Mindset 1 to Mindset 2. Thus, teachers might be able to change their teaching methods so that they fit with the digital era.

5. Legacy and future – areas of change

The present section will be devoted to the way teachers might integrate a new methodology which is more connected to digital education. Zur and Zur (2011) made the point that avoider teachers might be of the mindset that thinks their ability cannot be developed, and thus feel safe by resisting changing. Rosen (2010) thinks digital education has some negative consequences on students. For example, students who spend too much time in front of their computers might have neurological effects (e.g., brain damage). Students might get addicted, and if they spend too much time in the virtual world they might lose the communication skills that occur into face-to-face interactions. Student might not acquire knowledge they get from *Wikipedia*, and forget about the library books. Teachers might be right in their worries, however, they have to accept that multitasks, use of social media, use of online resources and Web 2.0 tools is what makes the digital students' world (see Figure 1 above). In this case, they have to think about their worries in terms of finding a methodology and content that fits the digital era.

Prensky (2012) argues that teachers are the ones who need to change because students cannot look backward; he stated, "educators need to reconsider both their methodology and their content" (p. 71). If teachers want to switch to Mindset 2, they have to communicate in the language their students understand, which requires them "to go faster, less step-by step, more parallel, with more random access" (Prensky, 2012, p. 71).

Moreover, they have to think about curricula in terms of legacy and future (Bayne & Ross, 2007; Feeney, 2010; Prensky, 2012). *Legacy* involves the traditional curriculum (reading, writing, math, etc.), whereas *future* involves digital content (Prensky, 2012). In this way, a switch to Mindset 2 is not digitizing what is old, but it is dealing with new material (Lankshear & Knobel, 2011). Teachers are more comfortable with traditional materials, but enthusiastic

adopters may turn their old skills into new ones with the help of enthusiastic participants. That is to say, enthusiastic adopters can invent digital-native methodologies for all subjects, using enthusiastic students to guide them (Prensky, 2012). The idea is based on collaboration between students and teachers (New London Group, 1996). The collaboration of the two categories might enable teachers to understand the way digital students learn. Once a digital curriculum is designed by the teacher and the students, all other categories of mindsets might be included through sharing and participation. Teachers need to understand the main areas of change.

Many scholars (e.g., Baynes & Ross, 2007; Knobel & Lankshear, 2011; Prensky, 2001, 2012; Rosen, 2010) have discussed the importance of understanding digital students in terms of not only thinking, but the way they do things:

- **Communicating**: Students are eager to use e-mail, texting, or chats. They have a large number of friends on *Facebook* and engage in online discussion groups much more easily than they do in a physical classroom. Because texting can be time-consuming, they have created their own language for it (abbreviations, numbers, and codes, etc.). Face-to-face communication is missing, but students use emoticons to express their feelings.

- **Sharing**: Students use different means for sharing, such as blogs, webcams, camera phones. Digital students multitask with cell phones, whereas non-digital students use cell phones for making calls only.

- **Exchanging**: Digital students exchange music, movies, or humor online. In Algeria, young people are active in peer-to-peer (P2P) exchanges, or torrents' download (Meguidi et al., 2012).

- **Creating**: Students can easily create their own websites and avatars.

- **Gaming**: They play games on their cell phones. They also play online, with tools such as *Facebook*.

Once they understand the areas of changes, teachers will encourage students to be more creative than they already are. Understanding these, however, cannot occur unless teachers have a flexible mindset.

6. Conclusion

The aim of this conceptual paper was to explore the way teachers; mainly those who come from low technology areas could change their methodology and content to fit with the digital frame. It

could be concluded that not all educators are resistant to change. It is also important to note that the lack of software or digital tools does not prevent teachers from changing their practices. In developing countries, digital tools are not as sophisticated as the ones used in developed countries. However, teachers could adapt their teaching in spite of the little available tools.

Change is connected to teachers' mindsets. If teachers are avoiders, they might think that digital education cannot be integrated, and thus might be comfortable with Mindset 1. On the other hand, those teachers who are mainly enthusiastic adopters are more willing to switch to Mindset 2 (Knobel & Lankshear, 2011). It is teachers, not students, who can decide what type of education might be offered to students. However, within the digital frame teachers and students are colleagues. The age where teachers go into class with a lesson plan, which was designed by teachers and policy makers might have ended. A new era of education has started where teaching/ learning are blended.

References

Alzouma, G. (2005). Myths of digital technology in Africa: Leapfrogging development? *Global Media and Communication*; 1, 339-355.

Bayne, S., & Ross, J. (2007). The 'digital native' and 'digital immigrant': a dangerous opposition. Paper presented at the Annual Conference of the Society for Research into Higher Education (SRHE) December 2007.

Bennet, S, Karl, M., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *British Journal of Education*. 39(3), 775-786

Cummins, J., Brown, K., & Sayers, D. (2007). *Literacy, Technology, and Diversity: Teaching for Success in Changing Times*. Boston: Allyn & Bacon/Pearson.

Chandler-Olcott, K., & Mahar, D. (2003). 'Tech-savviness' meets multiliteracies: Exploring adolescent girls' technology-related literacy practices. *Reading Research Quarterly*, 38, 356-385.

Dweck, C.S., (1999) *Self Theories: Their Role in Motivation and Personality*. Philadelphia, PA: The Psychology Press

Dweck, C.S., (2006). *Mindset: The New Psychology of Success.* New York:Ballantine books.

Egbert, J., El Turki, E., El Hussein, I., & Muthukrishan, R. (2012). Applying principles for new literacies in differing CALL contexts: conceptualizing issues for teaching, research, and policy. *CALL-EJ,* 13(2). Retrieved Jan 29, 2011, from http://callej.org/journal/13-2/Egbert_ElTurki__ElHussein_Muthukrishan_2012.pdf.

Feeney, L. (2010). Digital denizens. In *Instructional technology resources: In the spotlight*. The Richard Stockton College of New Jersey website. Retrieved Jan 29, 2011, from http://loki.stockton.edu/~intech/spotlight-digital-denizens.htm.

Freeman, D. (1989). Teacher training, development, and decision making: A model of teaching and related strategies for language teacher education. *TESOL Quarterly,* 23(1), 27-45.

Fullan, M. (2006). *The New Meaning of Educational Change. 4ᵗʰ Ed.* Columbia University: Teachers College Press.

Guemide, B., Benachaiba, C., & Bouzar, M. (2012). Exploiting ICT and e-learning in teacher's professional development in Algeria: the case of English secondary school teachers. *Malaysian Journal of Educational Technology,* 12(1). Retrieved Jan 29, 2011, from http://www.mjet-meta.com/past-issue---2012.php.

Hamdy, A. (2007). ICT in Education in Algeria**.** Survey of ICT and Education in Africa: Algeria Country Report**.** Retrieved Jan 29, 2011, from http://ddp-ext.worldbank.org/EdStats/DZApro07.pdf.

Harding, T. (2010). Digital Natives and Digital Immigrants. Retrieved Jan 29, 2011 from http://ccnmtl.columbia.edu/enhanced/primers/digital_natives.html

Lankshear, C., & Knobel, M. (2011). *New Literacies: Everyday Practices and Classroom Learning, 3ʳᵈ ed.* London: Open University Press.

Leu, Jr., D.J., Kinzer , C.K., Coiro, J., & Cammack, D.W. (2004). Toward a theory of new literacies emerging from the Internet and other Information and Communication Technologies. In R.B. Ruddell, & N.J. Unrau (Eds.), *Theoretical Models and Processes of Reading* (pp. 1570-1613). Newark, DE: International Reading Association.

New London Group. (1996). A pedagogy of multiliteracies: Designating social futures. *Harvard Educational Review*, 66(1), 60-92.

Peterson, S.L. (1999). Teachers and Technology: Understanding the teachers' perspectives of technology. San Francisco: International Scholars Publications.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon 9* (5). Retrieved Jan., 29, 2011, from http://www.marcprensky.com/writing/Prensky%20-20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf

Prensky, M. (2012). *From Digital Natives to Digital Wisdom: Hopeful Essays for 21st Century Learning.* Thousand Oaks, CA: Sage Publications.Corwin

Rosen, L. (2010). *Rewired: Understanding the iGeneration and the Way They Learn*. New York: Palgrave Macmillan.

Shulman, L.S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57, 1-22.

Toledo, C. A. (2007). Digital culture: immigrants and tourists responding to the natives' drumbeat. *International Journal of Teaching and Learning in Higher Education*, 19(1), 84-92. Retrieved Jan 29, 2011 from http://www.isetl.org/ijtlhe/pdf/IJTLHE152.pdf.

Tsui, A. B. M. (2009). Teacher education and teacher development. In E. Hinkel (ed.), *Handbook of Research in Second Language Teaching and Learning* (pp.21-40). Hoboken: Routledge.

Warlick, D,F. (2001). *Redefining Literacy for the 21ˢᵗ century*. Worthington,Ohio: Linworth Publishing.

Warschauer, M. (2003). Dissecting the 'digital divide': A case study in Egypt. *The Information Society, 19*(4), 297-304.

Zur, O., & Zur, A. (2011). Psychology of the Web & Internet Addiction. Online Publication by Zur Institute. Retrieved Jan 29, 2011, from http://www.zurinstitute.com/internetaddiction.html.