Vincze, Anikó
anvincze@gmail.com
assistant lecturer (University of Szeged, Hungary)

Digital Gaps in School? Exploring the Digital Native Debate

Abstract The students of today have mostly grown up surrounded by numerous digital technologies, like cell-phones, computers and the internet; therefore they are called digital natives by some scholars. These information and communication technologies are indispensable parts of their lives. The digital gaps which are caused by the (different) use of digital technologies are socially relevant primarily in school, as they influence the inequalities in education. In our article, we present the possible approaches of digital inequalities in school, the gap between teachers and students and the differences among students. We introduce the concepts and theories about the digital natives then sum up the main criticism about this thesis. Recent empirical studies and their results are presented to argue in favour of the heterogeneity of the digital native's generation.

Keywords digital gap, digital inequalities, digital natives, net generation, ICT use patterns

DOI 10.14232/belv.2015.1.9 http://dx.doi.org/10.14232/belv.2015.1.9

Cikkre való hivatkozás / How to cite this article:
Vincze, Anikó: (2015): Digital Gaps in School? Exploring the Digital Native Debate. Belvedere Meridionale vol. 27. no. 1. 116–125. pp
ISSN 1419-0222 (print) ISSN 2064-5929 (online, pdf)

1. Introduction

The problem of digital gaps or digital inequalities in education can be approached in two different ways. First, there are generational differences in ICT knowledge and usage between students and teachers. This is what the sociological literature describes with the popular terms "digital natives" and "digital immigrants" (Prensky 2001a). The main question that emerges in regard of this type of inequality is whether teachers are able to prepare students for their later life in an ICT based society? The other approach of digital inequalities in education focuses on the differences of ICT usage and knowledge among the digital native generation, the students. Many empirical researches inspired by the digital native–digital immigrant concept point out that the present generation of students cannot be considered as a homogenous group as far as their technology use is concerned. There are differences between them in terms of access, mode of use and ICT competence. These divergences among students imply the question how they influence the students' chances in education, or in other words, what impact ICT use has on school performance. How does ICT use contribute to a better or a worse school performance?

This paper aims to give a detailed overview of the two approaches of digital inequalities outlined in the introduction in order to offer a better understanding of the implications of ICT in education. We will first introduce the concepts of digital gap and digital inequalities in social sciences to familiarize the reader with some basic notions of the topic in focus. In the second chapter we give a summary of the concepts and theories of the emergence of a new, digitally well-equipped and technology-savvy generation. Then improvements of the concept and criticism are presented in the next section, as many scholars questioned the adequacy of these thoughts on the digital gap between students and teachers. To support the critics, the latest empirical findings of both quantitative and qualitative studies are introduced. These empirical works also refer to the second approach of digital inequalities in education, namely to the differences of the use among students. We intend to highlight the arguments that emphasize the heterogeneity of the digital natives.

2. The Digital Gap and the Digital Inequality Concepts

The interest of social sciences in technologies and their social implications has been a rather marginalized territory of research for a long time. However, first the appearance and spread of the television, then of other information and communication technologies – like cell-phones, computers and the internet – has directed the attention of social scientists gradually on these technologies and their effects on social life. Sociologists have caught up on these phenomena because of their characteristic of creating some kind of inequalities among groups and individuals in society (Bognár – Galácz 2004). When ICT began to spread, two common views emerged concerning the effects of them on social stratification. People and scientists had great expectations in connection with these technologies. They presumed that by giving access to information, knowledge and opportunities, the information and communication technologies would diminish social inequalities. The other – more pessimistic – view did not expect the ICT to decrease but to increase social inequalities as access of and competencies for these technologies are not evenly distributed in society (Pintér 2007, DiMaggio et al. 2001). Although both views can be theoretically supported, the latter assumption turned out to be realistic, since empirical studies have revealed huge differences both between regions or countries, and inside the societies, between individuals or groups of individuals.

The empirical studies applied distinct approaches to the digital differences according to the

level of penetration. At the beginning – when penetration was low - emphasis was put on the access, and dichotomous distinctions were made between the ones who have access to ICT and who do not, or later between those who use these applications and who do not. This is the concept of the *digital gap* or *digital divide* (DiMaggio – Hargittai 2001). Analyses with the focus on the digital divide have tried to reveal the socio-economic characteristics of the users and non-users. In a huge empirical study Norris (2001) unfolded the variables that influence the digital gap. It is not surprising that these factors are identical with the traditional socio-economic and demographic variables: gender, age, ethnicity, educational attainment, income, occupation and type of residence (rural or urban) are the main predictors of ICT access and use. According to Norris's findings, the variable that has the most significant impact on the digital divide is age. Young generations are ten times more likely to use the new information and communication technologies than older people. Thus generational differences, which will be discussed later in this paper, seem to beconstitute a significant dimension of the digital inequalities in terms of access and use.

When penetration reached a higher level, the focus of research has shifted from the dichotomous distinctions between users and non-users to the differences among the users. It has simply lost relevance to investigate the characteristics of the ones who have and who have no access to ICT, as access and use were available for the majority of the society[1]. This new approach directed the attention of researchers from the digital divide to digital inequalities. Thus, the term of digital inequalities refers to the differences among the users concerning the quality of use. These differences can be investigated in many dimensions. DiMaggio and Hargittai (2001) – who introduced the term of digital inequalities – suggest five dimensions of the digital inequalities. The first one is that of the (1) technical apparatus including hardware and software. The quality of the computer or other device that one uses to access the World Wide Web generates inequalities in use as the bad status of the hardware or the lack of special software limits the use. Technical apparatus also includes the type of connection. The dial-up connections make many applications difficult or unreachable; while a broadband connection does not limit the usage. Researches reveal the huge importance of the broadband connection in the ways of use. This type of connection leads to quantitative and qualitative changes in use. Broadband access may enhance the period of time spent with surfing the Internet. In a panel survey, Hitt and Tambe (2010) found an increase of 1300 minutes in the use in a month when the connection was changed to broadband access. They also revealed changes in the quality of use as people visited more entertaining and news sites after shifting to broadband connection. Kolko (2010) witnessed in his research a shift to "socially undesirable" uses e.g. downloading music as an outcome of the broadband access. Another dimension of the digital inequalities is (2) the autonomy of use according to DiMaggio and Hargittai. This category includes the place of use, the control of use and other aspects of autonomy. The use at home or at a public place can differ a lot. For example, the time of use may be limited in a library or school, and filters may be applied which hamper the usage. An important dimension of inequalities lies in the (3) ICT competencies, skills and knowledge. These cognitive factors vary among users leading to differences in the use of the internet. (4) Social support may also generate inequalities, as the use is facilitated for those who receive support from their family, friends. The last dimension

[1] Of course, the digital divide is still significant in many societies, primarily in developing countries, and the investigation of groups excluded from access and the use of ICT can be relevant in developed societies as well, but the digital inequalities among users is more in focus.

on the authors' list is (5) the purpose of use which can be very diverse. They make a distinction whether the use increases economic productivity, political or social capital, or the one serves mainly for entertainment. It is foreseeable that the two categories of use have a great impact on the inequalities among users.

Both the digital divide and the digital inequality conception are applied in studies dedicated to the differences between the digital immigrants and natives, and the generation of the digital natives itself. Before moving on to the empirical results, we describe the concepts and theories of the digital natives in detail.

2. The Teacher–Student Digital Gap

Concepts of the Digital Natives and Digital Immigrants

The concepts of an emerging new generation which differs in many ways from the previous one has begun to appear in the late1990s. Many terms were used to describe this generation of which the most popular ones are the *Net Generation* (Tapscott 1998), the *Digital Natives* (Prensky 2001a), the *Millennials* (Oblinger 2003) and the *Screenagers* (Rushkof 2006). These descriptions refer to the rise of a new generation that was born at the time when the different information and communication technologies began to spread rapidly. Some authors specify the period of time when this new generation was born. According to Tapscott, the Net Generation consists of those who were born between 1977 and 1997. Oblinger defines a shorter period of time for the Millennials: they are the group of people born between 1982 and 1991. Prensky does not give the exact dates for the birth of the digital natives, but his followers estimate the rise of the digital natives from the 1980s (Palfrey–Gasser 2008).

Although there are differences in defining the roots of the emergence of the new generation, all concepts share the view that one of the main characteristics of these children (and adults by now) is that they got to know ICT as a natural part of life. They have not known the world without cell phones, computers and internet and could not imagine how things would work without these devices. The socialisation among ICT has influenced the net generation's skills and the way they think and learn. That is why most of the theories concerning the digital natives are tightly connected to discussions about the education system in the 21st century.

The most popular concept belongs to Marc Prensky (2001a, 2001b) who makes a distinction between the so-called *digital natives* and the *digital immigrants*. He assumes that all the changes we see in the generation of the students nowadays –their clothes, slang, styles etc. - are due to the fact that they are the first generation who grew up with the new information and communication technologies. The name the author gives this generation – the digital natives – refers to their ability to speak the digital language as a "native speakers" (Prensky 2001a. 1.). They have learnt all the skills and knowledge about ICT naturally as a "mother language". In contrast, those who met the new digital technologies later in their lives could not fully acquire the digital language they retained an "accent". This is what happens to a migrant when settling in a new country getting to know a new culture. Most immigrants retain an accent, although they learn the language, the traditions and the norms of a new culture. This is why Prensky uses the term *digital immigrants* for the generation preceding the digital natives. The accent of the digital immigrants appears in many of their actions. for instance when they print out a document to edit it rather than doing it on the computer. These differences between the generations challenge the education system. Education is facing the problem that the *digital natives are taught by the*

digital immigrants. This situation results in complaining teachers about their students who do not pay attention and complaining students about their teachers, because they find their teaching methods boring and out of date. This mutual dissatisfaction leads to inefficient education. Prensky emphasizes that the teaching staff has to adapt to the changed skills, abilities and way of thinking of the students. He deduces the change of digital natives' thinking patterns from social psychology and neuroplasticity. The social psychological argument includes the presumption that the thinking patterns change depending on one's experiences (Prensky 2001b: 2). Studies revealed that the environment and culture in which people are raised affect and determine their thinking patterns (Prensky 2001b: 3). The students of today were raised in an ICT "culture" that's why we can assume that their way of thinking has changed. Neuroplasticity is a discipline in neurobiology which studies the physical changes of the brain that occur due to its persistent stimulation. Prensky considers the exposure to videogames, the computer and the internet such a stimulation which causes physical changes in the brains of the children. What are the different attitudes and characteristics of the digital natives and the digital immigrants? In their paper for educators Jukes and Dosaj (2006) collected these differences (Table 1).

1. Table ❖ *Characteristics of the digital natives and the digital immigrants. Source: Jukes – Dosaj 2006. 37.*

DIGITAL NATIVES	DIGITAL IMMIGRANTS
prefer receiving information quickly from multiple multimedia sources	prefer slow and controlled release of information from limited sources
prefer parallel processing and multi-tasking	prefer singular processing and single/limited-tasking
prefer processing pictures, sounds and video before text	prefer to provide text before pictures, sounds and video
prefer random access to hyperlinked, interactive, multimedia information	prefer to provide information linearly, logically and sequentially
prefer to interact/ network simultaneously with many others	prefer students to work independently rather than network and interact
move seamlessly between real and virtual spaces instantaneously	prefer to operate in real spaces
prefer to learn "just-in-time"	prefer to teach "just-in-case"
want instant access to friends, services and responses to questions, instant gratification and instant rewards	prefer deferred gratification and deferred rewards
prefer learning that is relevant, instantly useful and fun	prefer to teach to the curriculum guide and standardized tests

The differences between the characteristics of digital natives – the students – and the digital immigrants – the teachers – generate a tension between these groups which is disadvantageous for the efficiency of education. For these reasons Prensky suggests that the education methods should be adapted to the students' way of thinking and learning: translated into the digital native's "language". He encourages education staff to use computer games as pedagogical tools for education. Digital natives are familiar with computer games and with a game designed appropriately for educational purposes students would learn geography, maths and other subjects

easily and in an entertaining way. Some teachers might doubt the efficacy of computer games for providing the required knowledge, however, Prensky shows through examples that games can be very useful. He claims that the content of the curriculum doesn't have to be changed just the mean of teaching it. In all subjects new methods can be invented which adapt more to the digital natives' language. Besides the new methods, new contents should be included in education like digital and technological knowledge and also disciplines like ethics, politics, sociology etc. (Prensky 2001a. 4.).

Many thinkers caught up on Prensky's concept and developed the idea of a new digital generation. The students who Oblinger (2003) calls the Millennials are more or less identical with the digital natives. She identifies three generations of "new learners". These are the "Baby Boomers" who already graduated from college, the "Generation X" who are currently doing their college studies and the "Millenials" who are just entering higher education. They need to be paid a special attention at as higher education has to take into account the expectations and characteristics of the new students to retain their competitiveness (Oblinger 2003. 42.). The Millennials apply distinct learning styles from the previous generations; they prefer teamwork, experiential activities and the use of technology (Oblinger 2003. 38.). For them – like for the digital natives -, technology is a natural part of life. According to Oblinger's research those students who incorporated technology use within their socialization differ in their attitudes and aptitudes towards learning.

3. Critics of the Digital Native Concept

The concept of a new generation of students, especially the thoughts of Prensky, have been modified and criticized since their appearance. The critiques addressing the digital native-digital immigrant concept are of two kinds. One group of critical arguments is more theoretical and concerns the dichotomous distinction between the two generations and the implications of the concept for a radical change of the education system. Other critiques emphasize the lack of empirical support of the concept and claim that empirical research leads to results that undermine the digital native discourse.

Even some of the writers who actually agree with Prensky's concept refine some parts of it. In their huge work on the digital natives, Palfrey and Gasser (2008) declare that they do not consider the digital natives to be a new generation, but a population. They doubt the rise of an entire generation, as children of the same agein developing countries do not even have access to or lack the cognitive skills to use the new technologies as digital natives in wealthy countries do. For this reason, one cannot expand the digital native label to all people who were born in a defined period , as the place of birth in terms of developed or developing country also matters. The authors suppose that even in a developed country there might be groups of people who do not belong to the digital native population, although they were born at the same time, because they are an underprivileged class in society (Palfrey – Gasser 2008. 14.). Besides the limitation of the digital native attribute, the authors also introduce a third group in the digital era, these are the *digital settlers.* The digital settlers are a transitive category between the digital natives and immigrants. They got to know the new technologies from the beginning , but they grew up mostly in an "analogue-only" world. They are familiar with ICT and use these technologies often in a sophisticated way, but they continue to rely on analogue forms of interaction (Palfrey – Gasser 2008. 4.). Another category that was introduced by Toledo (2007) is the *digital tourists* who cannot avoid entering the digital world from time to time, but they do not do it with pleasure.

Most of the critics of the digital native concept mention the lack of empirical analysis on this population. They consider Prensky's view on a radical change of the education system as a moral panic (Z. Karvalics 2001). Critical approaches on the digital native-digital immigrant concept rely on the results of empirical fieldwork on this generation (Selwyn 2009, Benett-Maton 2010). The findings of quantitative and qualitative research on the one hand confirm that there are differences between students and their teachers in their use of ICT and their competences, but on the other hand they question the strict distinction of generations and reveal the digital natives to be a homogenous group regarding their ICT use. We will present some of the recent empirical findings in the next section.

4. The Student– Student Digital Gap

Empirical Findings on the Digital Natives' ICT Use and Attitudes

Researches inspired by the digital native debate have been conducted in many regions mostly in developed countries – like the US (Hargittai 2010), the UK (Jones et al 2010, Margaryan et al. 2011), Canada (Salajan et al. 2010) – but also in some developing regions like South-Africa (Brown – Czerniewicz 2008). There have been investigations regarding the students' use of computers and the internet in every level of education in elementary school and high school (Eynon – Malmberg 2011, Jackson et al. 2010) and mostly in higher education (Salajan et al. 2010). The researches dominantly use quantitative methods, but some investigations combined these with qualitative methods (e.g. Margaryan et al. 2011) and we find studies with an emphasis on the qualitative approach (Ben-David Kolikant 2010). What are the main findings concerning the digital natives' ICT use patterns and attitudes?

Jones et al. (2010) conducted a quantitative research among first year university students – born after 1983 – at five universities in the United Kingdom to explore their usage patterns of ICT and to investigate whether this population can be considered as a homogenous group of digital natives. The survey consisted of four sections: demographic characteristics of the respondents, access to technology, use of technology in university study and course-specific uses of technology. The results are partly confirmed the concept of the digital natives, as the researchers found an extensive access to and use of ICT. On the other hand, the concept of the generational homogeneity was not supported by the results, because minorities were revealed who use technology differently. Some reported a low use of e-mail, others often download or upload materials from/to the internet and there is another minority that contributes to blogs and wikis. This research found a complex picture of minorities in the same age group which contradicts the notion of a homogenous digital native generation.

The study of Margaryan et al. (2011) addressed not only the technology use patterns of university students, but their use of technologies for learning as well. They used a mixed method of a questionnaire and an interview. Not only students, but also educational staff were asked in the survey to compare the two generations' technology use and attitudes. Besides the age dimension, the researchers added a discipline dimension as their sample consisted of students and teachers from Engineering and Social Work. The quantitative results show that students from a technical discipline and digital natives use more technology tools than students from a non-technical discipline and digital immigrants. However, considering the learning styles of the digital natives the "*... study found no evidence to support previous claims suggesting that current generation of students adopt radically learning styles, exhibit new forms of literacy, use digital technologies in sophisticated ways, or have novel expectations from higher education.*" (Margaryan

et al. 2011. 438.). The interviews revealed that students prefer rather traditional, conventional, passive learning and teaching methods. The authors conclude that although education has to change somehow to adapt to the new challenges the claims for these changes cannot be based on the argument of the shifting learning patterns of the students.

The digital native-digital immigrant dichotomy was put more in the focus of the research of Salajan et al (2010). They investigated the inter-generational differences in technology use and the attitudes towards adopting digital technologies in teaching and learning. The research was conducted among students and staff of the Faculty of Dentistry in Toronto. The samples were asked the same questionnaire at the beginning and at the end of the academic year to conceive the changes after exposure to technology use in the courses. Their findings show that there are age-related differences in technology use between students and faculty members, but these differences are minimal and with no universal applicability. According to their results, the authors claim that the digital native-digital immigrant divide is *"... an overly simplified, narrow and potentially rifting perspective..."*(Salajan et al. 2010. 1402.).

The mostly quantitative analysis presented above point out that a more sophisticated understanding of the revealed intra-generational differences and the implications of ICT use for learning should be outlined by qualitative research. A mainly qualitative study was conducted by Ben-David Kolikant (2010) among high school students in Israel. Her research question was how the digital natives themselves perceive the impact of ICT on learning and school performance in comparison to the digital immigrant generation. The answers of the students revealed an ambivalent judgement of ICT – mainly the internet – regarding its role in learning and school performance. Although the majority of the students who all were intensive users of the internet claimed that the internet was a helpful and useful tool for learning, they considered their knowledge and skills in learning worse than of the generation grown up before the internet. The reasons for this view are related partly to the school being "old-fashioned", as many interviewees exprssed. They told that the school does not adapt to the changed ways of thinking and abilities of the students who are digitally-savvy. The children considered their knowledge worse, because they assumed that the generation before the internet read more books and was more diligent as they were not "tempted" by the digital technologies.

6. Conclusion

Digital inequalities in education have to be perceived, as they are challenging the efficacy of education in many aspects. As one dimension of digital inequalities, we introduced the concepts of the digital native-digital immigrant divide which concerns the differences between teachers and their students. These thoughts on the radical change of the education system somehow generated a moral panic after their appearance. However, we underlined the necessity of empirical support of this thesis and questioned the concept of a radical change by presenting the critical approaches of this concept. There is no evidence that the students of today would be in any aspects different to their ancestors due to their exposure to information and communication technologies. The education system has to consider these new skills and communication forms of the students, but teachers should not be discouraged by getting categorizedg as digital immigrants. They have huge responsibility to guide the students in the digital world and to show them how they can use the new opportunities of the internet and other ICT to gainadvantage in learning. The other dimension of the digital inequalities in education concerns the differences between the students which were revealed by many empirical studies inspired by the digital native debate.

The empirical findings – some of which recently published works we presented– challenge the digital native concept by pointing out that this generation cannot be handled as a homogenous group. There are differences in connection with the access and the use of ICT. We share the view of Palfrey and Gasser on the digital natives who are rather a population than a generation, as aspects of the digital divide, the socio-economic factors and the dimensions of the digital inequalities still play an important role among students. Teachers should take into account these differences when applying teaching methods that require digital skills and knowledge. A better understanding of both approaches of the digital inequalities in education needs more empirical analyses for being able to suggest changes for education. ✻

BIBLIOGRAPHY

Ben-David Kolikant, Y. (2010): Are Digital Natives, Better Learners? Students' Beliefs about How the Internet Influenced their Ability to Learn. *Computers in Human Behavior* vol. 26. http://www.sciencedirect.com/science/article/pii/S0747563210000889

Benett – Maton (2010): Beyond the 'Digital Natives' Debate: Towards a More Nuanced Understanding of Students' Technology Experiences. *Journal of Computer Assisted Learning* vol. 26. 321–331.

Bognár É. – Galácz A. (2004): *A társadalmi egyenlőtlenségek új dimenziója: „digital gap" nemzetközi összehasonlításban*. IFM Humán Erőforrás Háttértanulmányok. Budapest. http://mek.oszk.hu/06500/06558/06558.pdf

Brown, C. – Czerniewicz, L. (2008): Student Use of ICTs in Higher Education in South Africa. In P.A van Brakel (ed): *Proceedings of the 10th annual Conference on World Wide Web Applications*. Cape Town (South Africa), Cape Peninsula University of Technology.

DiMaggio, P. – Hargittai, E. (2001): *From Unequal Access to Differentiated Use: A Literature Review and Agenda for Research on Digital Inequality*. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.85.6001&rep=rep1&type=pdf

DiMaggio, P. et al (2001): Social Implications of the Internet. *Annual Review of Sociology*.

Eynon, R. – Malmberg, L-E. (2011): A Typology of Young People's Internet Use: Implications for Education. *Computers in Human Behavior* vol. 56. http://www.sciencedirect.com/science/article/pii/S0360131510002836

Hargittai, E. (2010): Digital Na(t)ives? Variation in Internet Skills and Uses among Members of the "Net Generation". *Sociological Inquiry* vol. 80. 1. 92–113.

Hitt, L. – Tambe, P. (2007): Broadband Adoption and Content Consumption. *Information Economics and Policy* vol. 19.

Jackson, L. et al. (2011): A longitudinal Study of the Effects of Internet Use and Videogame Playing on Academic Performance and the Roles of Gender, Race and Income in These Relationships. *Computers in Behavior* vol. 27.

Jones et al 2010: Net Generation or Digital Natives: Is there a Distinct New Generation Entering University? *Computers & Education* vol. 54. 722–732.

Jukes – Dosaj (2006): Understanding Digital Children. Teaching &Learning in the New Digital Landscape. http://edorigami.wikispaces.com/file/view/Jukes+-+Understanding+Digital+Kids.pdf

Kolko, J. (2010): How Broadband Changes Online and Offline Behaviors. *In Information Economics and Policy 22*.

Margaryan et al. 2011: Are Digital Natives a Myth or Reality? University students' use of digital technologies. *Computers & Education 56*, 429-440

Norris, P. (2001): *Digital Divide. Civic Engagement, Information Poverty and the Internet in Democratic Societies*. New York, Cambridge University Press.

Oblinger, D. (2003): Boomers, Gen-Xers and Millenials: Understanding the New Students. *Educause Review July/August 2003* http://net.educause.edu/ir/library/pdf/erm0342.pdf

Palfrey, J. – Gasser, U. (2008): *Born Digital: Understanding the First Generation of Digital Natives*. New York: Basic Books

Pintér R. (2007) (szerk.): *Az információs társadalom (Information Society)*. Budapest, Gondolat – Új Mandátum Kiadó.

Prensky, M. (2001a): *Digital Natives, Digital Immigrants*. http://www.marcprensky.com/writing/prensky%20-%20digital%20natives,%20digital%20immigrants%20-%20part1.pdf

Prensky, M. (2001b): Do They Really *Think* Differently? http://www.marcprensky.com/writing/prensky%20-%20digital%20natives,%20digital%20immigrants%20-%20part2.pdf

Rushkof, D. (2006). *Screenagers: Lessons in Chaos from Digital Kids*. Hampton Press, Incorporated.

Salajan, F. et al. (2010): Student and faculty inter-generational digital divide: Fact or fiction? *Computers & Education* vol. 55. 1393–1403

Selwyn, N (2009): The Digital Native –Myth and Reality. *Aslib Proceedings: New Information Perspectives* vol. 61. no. 4. http://comminfo.rutgers.edu/~tefko/Courses/e553/Readings/Selwyn%20dig%20natives,%20Aslib%20Proceedings%202009.pdf

Tapscott, D. (1998): *Growing up Digital: The Rise of the Net Generation*. New York, McGraw-Hill.

Toledo, C. (2007): Digital Culture: Immigrants and Tourists Responding to the Natives' Drumbeat. *International Journal of Teaching and Learning in Higher Education* vol. 19. no. 1. 84–92.

Z. Karvalics L. (2001): A netnemzedék vizsgálatának szemléleti alapjai (The Basic Aspects of the Examination of the Net Generation). *Új Pedagógiai Szemle* 2001. július–augusztus