

AKO SA UČIA DIGITÁLNI DOMORODCI

HOW DIGITAL NATIVES LEARN

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Abstrakt

Účinky éry digitálnej puberty sú široko diskutované rodičmi, učiteľmi, sociálnymi expertmi. Permanentné zavesenie v digitálnom priestore – 24/7/365, textovanie, okamžité spracovanie správ, permanentné pripojenie, pripojenie na sociálnej sieti – to je priestor, v ktorom teraz žijú tínedžeri a študenti. Učitelia by mali zobrať do úvahy, že učia mladých ľudí, ktorí sú odlišní od predchádzajúcich v ich vzťahu k vedomostiam. Narodili sa do prítomnosti technológií, sú technologickí domorodci: web, laptopy, digitálne obrázky a videá, blogy, emaily, čítanie, wikiny sú tu od ich narodenia. Posun vzdelávacej paradigmy resetoval meter na číslo “nula”, čo znamená, že každý učiteľ by sa v súčasnosti mal sám intenzívne vzdelávať kvôli otvorenejším vzdelávacím stratégiám v porovnaní s minulosťou. Avšak, aby sme si boli istí, že digitálne pomôcky budú dávať maximálne výsledky, musíme akceptovať, že cez učiteľov sa neprenáša 100 % vedomostí; musíme akceptovať realitu, že nikto nemá monopol na vedomosti.

Kľúčová slova: digitálni domorodci, učenie sa, digitálne technológie

Abstract

Digital puberty era effects are being discussed by parents, teachers, social experts. It is this cyberhangout – 24/7/365 on, texting and instant messaging, everconnected, plugged into one social network or another – where teens and students now live. Teachers should to consider that they teach to youngsters who are different from before, in their relationship with knowledge. They were born with the presence of technology, they are technology natives: the Web, laptops, digital pictures and videos, blogs, emails, chatting, Wikis are there since their birth! The educational paradigm shift has reset the meter to zero, meaning that every teacher should now to educate intensively himself, to bring forward more open strategies than he had previously used. However, to make sure those tools produce maximum results, we need to accept that not 100 % of knowledge will transit through teachers: we have to accept the reality that nobody has the monopoly of knowledge.

Keywords: digital natives, learning, digital technologies

Introduction

Each child is unique in personality, learning styles and family background. Children are not „small adults“. We need to respect children, to accept them, to encourage them. Effective teachers never stop exploring different ways to improve child and student achievement. The play with children

is one of learning. Instead of quietly listening children should be expected to actively participate. High quality play is often noisy with laughter, questions and talking. If the children are not questioning, commenting or interrupting appropriately, something is wrong. As there is no single, perfect solution, educators look to research to guide their practice. Recent innovations in science have allowed an unprecedented look into the way the brain works. The exciting learning about brain function and its effects on learning have the potential to revolutionize teaching and learning. (2, 3, 6) Brain research has provided new knowledge about the many ways that humans learn. Children draw, write, dramatize, make graphs and models to represent what they know and understand. Today it is nicely performed also through information technology. Computers, if used appropriately, can have positive effects on children learning. [1, 2, 3]

Learning and real life

Students often cannot apply what they have learned at school to solve in real world and daily life. For example, they may learn about Newton's laws at school but fail to see how they apply in real life situations. Which is nice, children are repeatedly restarting, if not successful. In specific situation they are even „resetting“ their minds, attitude, when restarting is not enough – being older. Transfer of knowledge to real life is very important from the very early school days. Why should someone want to go to school if what is learned there does not transfer to other situations and cannot be used outside the school? Research shows that there are major developmental differences in learning. As children develop, they form new ways of representing the world and they also change the processes and strategies they use to manipulate these representations. In addition, there are important individual differences in learning. Developmental psychologist Howard Gardner has argued that there are many dimensions of human intelligence other than the logical and linguistic skills that are usually valued in most school environments. Some children are gifted in music, others have exceptional spatial skills, or bodily/kinaesthetic abilities, or abilities to relate to other people. What do they already know individually is a base for teacher to build up new level of children knowledge. Schools must create the best environment for the development of children taking into consideration such individual differences. [1, 2, 8] Children are connecting informations, they are linking new information to old ones. When children make connections, they make sense of new information by seeing how it fits with what they already know. Basic units of learning are: wonder, discover and experience. [2, 7, 8]

Brain is behind

According to Dimmitt [4] there are approximately 10^{11} neurons (nerve cells) in an adult brain. Each neuron can have up to 10 000 dendrite branches (where it receives and transmits electrical impulses from other neurons). Thus, it is possible to have up to 1 000 000 000 000 000 synaptic connections in one brain. Brain is twice as active during first 10 years of life as it is during adulthood. The brain is active during sleep; sleep is crucial to learning. Immediate memory is first step in short-term memory processing; primarily “unconscious”, not conscious decision. Data is held 30+ seconds. If previous experience determines that information is not important, it is forgotten. If experience is important, response is “new learning”. Information next moves from immediate memory to working memory (conscious processing, intend to remember, decide to do so). Time limits for working memory depend on motivation, age, how content is being used, and emotional content. Intense processing can occur for 5-10 minutes for children and 10-20 minutes for adolescents and adults. It is important breaking information down into chunks of fewer than 6 pieces of information will improve learning. Information taken in while reading fades as text changes to new subject, Information is displaced if amount added exceeds limit of working memory capacity. To learn something that was read requires concentration and active effort. And there is also a strong place of multisensory stimulation and multimedia presentation and information technology tools to enhance the learning procedures. As for long-term storage matters – it is on the scene, when content of learning moves from working memory to long-term one. Content moves when new information makes sense and meaning based on prior knowledge and experience (Does this fit to what I know about how the world works? Is this relevant to my life?). Of the sense and meaning, the meaning is more significant. Long-term storage of information occurs during sleep. Testing for knowledge after 24 hours can determine if information made it into long-term storage. [4, 5, 8]

Learning and learners

Learning means repeating a thought or action strengthens specific connections between nerve cells. Learning moves content from working memory into long-term storage. There are monitoring and controlling circuits of nerve cells which determine what is important to learn. Learning is connections between prior knowledge and understandings and new information. Connections between existing neural pathways and new pathways. New learning = new pathways = more neural dendrites. And motivation to learn is one of base. Motivated learners are easy to recognize because they have a passion for achieving their goals and are ready to expend a great deal of effort. They also show considerable determination and persistence. This influences the amount and quality of what is learned. [1, 4, 8] Children are happy with novelty,

humour, emotion, multi-sensory content and movement (exercise activities); these are ways to generate attention. So there is a need to pay attention to what children are doing. All teachers want to have motivated learners in their classrooms. How can they achieve this? Psychologists distinguish between two kinds of motivation: extrinsic motivation and intrinsic motivation. Extrinsic motivation results when positive rewards are used to increase the frequency of a target behaviour. Praise, high grades, awards, money and food can be used for that effect. Intrinsic motivation is when learners actively participate in activities without having to be rewarded for it. The child who likes to put together puzzles for the fun of it is intrinsically motivated. [1] Changing the learning activities (lecture, role play, discussion groups etc) every 10-15 minutes, or creating learning stations so that children can change what they are doing on a regular basis, will maintain involvement, interest in learning and promote learning in all age group of children and young people education. Long-term storage of information (knowledge, experience) is the outcome of learning. Much of classroom learning content makes sense but lacks meaning. To promote learning more of a challenge to move this learning content to long-term storage. Teachers need to help students find the personalized meaning of the content as much as to understand it, for it to be remembered. Connect the new content to students' prior knowledge and experience – creates meaning. [4, 5, 8] Stimulants of learning promoting - classroom environments that promote learning: enriched physical environment (complex environments stimulate learning; visual stimulation; change in displays; adequate light, natural if possible; opportunity for physical movement; student work displayed; student input into classroom environment). [4] Today teaching methods are attempting to become more student-centred than teacher-centred, to connect the school to real-life situations, and to focus on understanding and thinking rather than on memorization, drill and practice. [1, 3, 8] Teachers should design the learning environments of today's schools; namely, learning environments that encourage students to be active learners, to collaborate with other students, and to use meaningful tasks and authentic materials. [1] Environments where students feel physically and emotionally safe promote attention and learning. Learning requires the active, constructive involvement of the learner. [1] Emotion is a powerful force in learning because new information goes through the emotional centers of the brain first. Prior experience and how someone feels about a piece of information determines the amount of attention that will be given to the topic. Children and students barely begin to register information if they are overly stressed, anxious, or fearful. Learning how to manage emotions (controlling impulses, expressing emotions, reducing stress, delaying gratification) is a crucial part of developing into a successful learner. Learning at school requires students to pay attention, to observe, to memorize, to understand, to set goals and to assume responsibility for their own learning. These cognitive activities are not possible without the active involvement and engagement of the learner. Teachers must help students

to become active and goal oriented by building on their natural desire to explore, to understand new things and to master them. It is a challenge for teachers to create interesting and challenging learning environments that encourage the active involvement of students. The following are some suggestions as to how this can be done:

- Avoid situations where the students are passive listeners for long periods of time.
- Provide students with hands-on activities, such as experiments, observations, projects, etc.
- Encourage participation in classroom discussions and other collaborative activities.
- Organize school visits to museums and technological parks.
- Allow students to take some control over their own learning. Taking control over one's learning means allowing students to make some decisions about what to learn and how.
- Assist students in creating learning goals that are consistent with their interests and future aspirations. [1]

Teachers can make classroom activities more meaningful by situating them in an authentic context. An example of an authentic context is one in which the activity is typically used in real life. For example, students can improve their oral language and communication skills by participating in debates. They can improve their writing skills by being involved in the preparation of a classroom newspaper. Students can learn science by participating in a community or school environmental project. [1] Children develop strategies to help themselves solve problems from an early age. For example, when pre-school children are told to go to the supermarket to buy a list of food items, they often repeat the items on their way to remember them better. These children have discovered rehearsal as a strategy to improve their memory without anybody telling them to do so. When they go to school, children need help from teachers to develop appropriate strategies for solving mathematics problems, when understanding texts, doing science, learning from other students, etc.

Teachers can help students become self-regulated and reflective by providing opportunities:

- To plan how to solve problems, design experiments and read books;
- To evaluate the statements, arguments, solutions to problems of others, as well as of one's self;
- To check their thinking and ask themselves questions about their understanding— (Why am I doing what I am doing? How well am I doing? What remains to be done?) [1]

All teachers want their students to understand what they are learning and not to memorize facts in a superficial way. Research shows that when information is superficially memorized it is easily forgotten. On the contrary,

when something is understood, it is not forgotten easily and it can be transferred to other situations. In order to understand what they are being taught, students must be given the opportunity to think about what they are doing, to talk about it with other students and with teachers, to clarify it and to understand how it applies in many situations. [1, 4, 5, 8]

Research shows that people must carry out a great deal of practice to acquire expertise in an area. Even small differences in the amount of time during which people are exposed to information can result in large differences in the information they have acquired. Cognitive psychologists Chase and Simon (1973) studied chess experts and found that they had often spent as many as 50,000 hours practising chess. A 35-year-old chess master who has spent 50,000 hours playing chess must have spent four to five hours on the chessboard from the age of 5 every day for thirty years! Less accomplished players have spent considerably less time playing chess. Research shows that the reading and writing skills of high school students relate to the hours they have spent on reading and writing. Effective reading and writing requires a lot of practice. Students from disadvantaged environments who have less opportunities to learn and who miss school because of work or illness will not be expected to do as well at school compared to children who had more time to practice and acquire information. [1] Children are happy with „problem solving“, they try identify „the problem“ and the ways to solve it using materials, media, even information technology in different ways. They are communicating and sharing observations and understandings with others. Children learn best when their individual differences are taken into consideration. [1, 3, 8]

What and how to do

The following are recommendations for creating the best environment for the development of children, while recognizing their individual differences:

- Learn how to assess children's knowledge, strategies and modes of learning adequately.
- Guide and challenge students' thinking and learning.
- Ask children thought-provoking questions and give them problems to solve.
- Create connections to the real world by introducing problems and materials drawn from everyday situations.
- Show children how they can use their unique profiles of intelligence to solve real-world problems.
- Help learners set realistic goals.
- Promote co-operation rather than competition. Research suggests that competitive arrangements that encourage students to work alone to achieve high grades and rewards tend to give the message that what is valued is ability and diminish intrinsic motivation. [1]

Summary

Our students (digital natives) are changing radically. Today's students are no longer the people our educational system was designed to teach. Thanks to ICT education environment is available anywhere for all 24/7 in uncountable spectrum of educational sources and media. Today challenge: new education + new training create new culture of society. An excellent teacher should not be reproducing clones of his or her self but helping students discover their individuality and creative ability through ICT. There are arising new challenges: How to teach teachers to teach with new media? Or even: How to teach teachers (mostly digital immigrants) of future teachers to teach with new media? Education should be: student-centered learning, multi-sensory stimulating, multi-path progressing, using multimedia, collaborative work, information exchange, supporting critical thinking and creativity.

Children learn best when they are not pressured to learn in a way that is of no interest to them. In a professional attitude an optimal way how to fix the information is to link them with context in real life. How children learn is a question which is receiving increased emphasis because of the attention given to growth and development in the early years. Research indicates that computer technology can help support learning, and that it is especially useful in developing the higher order skills of critical thinking, analysis, and scientific inquiry. [2]. Though there is no one absolute answer, there are some concepts or generalizations we can make about how children learn.

1. Children learn what they want to learn, not what we want them to learn. So encouraging a love of learning is important. You are a motivator.
2. Children learn a little at a time - very slowly. We often expect too much beyond their level. "I told you that yesterday." Of course you did, and you'll say it tomorrow, clearly and without irritation.
3. Children learn by what they see us do - far more than what they hear us say.
4. Children learn what they understand. Here again, we often try to teach beyond their level. We may have to say it more than one way.
5. Children need to be taught patiently, gently but firmly.
6. Children learn more by what is right than by what is wrong. Use a positive approach giving directions and ideas rather than "no-no's."
7. Knowledge of improvement has a positive effect upon learning. We should tell children when they have learned or accomplished something.
8. Children learn more in a friendly atmosphere than in an unfriendly one.

Children learn many things through play because play allows for exploration and discovery. All of the child's senses are involved in the learning process (hearing, seeing, touching, smelling, tasting). [7]

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