TANULMÁNY

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Ágnes Sántha-Malomsoki: Influence of CALL on Early Bilinguals' Visual and Verbal Creativity and Daily Habits on ICT use
Alkalmazott Nyelvtudomány, XVIII. évfolyam, 2018/1. szám
doi:http://dx.doi.org/10.18460/ANY.2018.1.005

Influence of CALL on Early Bilinguals' Visual and Verbal Creativity and Daily Habits on ICT use

A tanulmány az infokommunikációs technológiák és a másodiknyelv-elsajátítás lehetséges transzferhatását vizsgálja kreativitást igénylő feladatok megoldásakor. A vizsgálat 32 magyar–angol két tanítási nyelvű nyolcadik osztályos tanuló részvételével történt, akik közül 13 heti rendszerességgel CALL (számítógéppel támogatott) nyelvórán vett részt három hónapon keresztül. A tanulók kreatív képességét a Körök Teszt és a Szokatlan Használat Teszt segítségével térképeztük fel. A két teszt értékelése a kreativitás három aspektusa mentén történt – eredetiség, rugalmasság és folyékonyság. A vizsgálat eredményei azt mutatják, hogy nincs számottevő pozitív vagy negatív transzferhatása a számítógéppel támogatott nyelvtanításnak a tanulók kreatív képességére nézve.

1. Introduction

Today academics and practitioners at all levels of education are constantly struggling with the challenge of getting undermotivated digital natives engaged in tasks requiring linear learning strategies. It is unquestionable for everybody who is concerned about the upbringing of today's students that breaking up with the 'drill and skill'-type of education is now urgent. The hypothesized way to maintain students' attention is teachers' willingness to apply new methods. Digital technology changes students attitudes towards the world hence towards learning. Teachers now feel the urge to insert technological novelties in their practices despite the fact that they are not aware of the outcomes of using them in the classroom.

> Schools as we know them have to change if they want to be offering today's young people an education that is relevant to the way they live and will work in the twenty-first century.' (Whitby, 2013: 133)

The only fuzziness about it is the extent of this change.

1.1 Devolution of 'Drill and Skill' Education: Future Prospects

There are numerous explanations why insertion of digital devices in educational settings seems to be justified. Some of these focus on the external imperatives calling for a change: schools committed to preparing students for life emphasize the benefits of technology-based education such as bringing people

together and making them able to cooperate effectively while still positioning the individual at the centre of the learning process. They also highlight that cooperation as a core component in the evolution of a successful society and economy can be assisted by technologies since they support dispersed forms of learning and activates large groups of people at the same time. (Selwyn, 2017) Collaboration is highly dependent on communication which has also been touched upon due to the extensive use of digital devices and online platforms. In spite of the fact that, today there are many technical possibilities at hand, online communication is still dominantly text-based. Information process is delayed compared to offline communication and seems less effective and often self-serving (Ollé, 2012).

Today information and knowledge (as immaterial goods) overweigh the traditional importance of manufacturing and the production of material goods. Many occupations are centered on information processing with flexible and adaptable workers who are able to create and manipulate information-based products and services (Selwyn, 2017). To work in the 'knowledge economy' or 'networked society' future workforce needs to master ICT literacy skills such as search literacy, tagging literacy, information literacy, filtering literacy and attention literacy (Pegrum, 2011). These skills are strongly related to the use of the Internet which is a sphere where loads of stimuli come from. These are all repetitive, intensive, interactive and addictive and are supposed to cause changes in the brain. Cognitive and brain sciences underline the effects of any pervasive experiences on the brain structure and development due to the brain's plasticity (Kroll&Bialystok, 2013). Apart from the functional and structural impact, the Internet also generates changes in mediating the information, in reading habits and in information processing which lead to a kind of network-thinking or content-amnesia. However, digital natives have a better working memory capacity (Tari, 2011) they do not have enough time to deepen the new information into knowledge due to skipping among sites and data. Using search engines results in the unnecessity of long-term storage of information in the memory because the route to information is easily accessible whenever it is required. Focusing attention is inevitable in the learning process and skipping among sites hinders it, hence it is supposed to suffer heavy losses. This might result in a superficial knowledge which is not a good base for grounded decisions or critical thinking – two of the most important features of the future workforce (Tari, 2011). Furthermore, instead of abstract thinking, they master their thinking in images. Pictures and icons hinder symbolic thinking and have a negative effect on higher order brain functions and processes such as abstract vocabulary, reflection, inductive problem-solving, critical thinking and creativity (Greenfield, 2009). Tari (2015) also confirms that millennials are less developed in detailed and reflective thinking, motivation for creative solutions and in originality and fluency of ideas.

At the same time, other explanations calling for a change in the out-of-date education point out the positive internal effects of ICT use on higher-order thinking abilities. However, the results of such studies are controversial. While Subrahmanyam, Greenfield and Kraut's (2001) findings confirm the ICT use's positive impact on intelligence and students' achievements at school and the increase of general IQ level of the population, its extent in each test is different. The largest growth was observed in non-verbal tests like fluid intelligence, abstract thinking and visuo-spatial tests while results of tests measuring verbal skills, general knowledge and skills necessary for school success showed the slightest growth (Kovács&Faragó, 2016). Digital natives' fluid intelligence seems to be higher compared to previous generations although there might be many reasons leading to this growth such as improved nutrition, smaller families, better education, mixed genes of parents and fast-changing environment to which they have to adjust to *(*Mingroni, 2004).

Finally, findings of the OECD's (2015) study on *Students, Computers, and Learning* also highlight the fact that frequent computer users do a lot worse in most learning outcomes than moderate or rare computer users. Moreover, no appreciable improvements in student achievement were found in reading, mathematics or science in the countries that had invested heavily in ICT for education. The summary emphasizes the importance of human intervention in the creation of deep conceptual and higher-order thinking abilities and draws educators' attention to getting as many methodological tools and tricks out of the online platform as they are able to in order to support the learning process at the highest level.

1.2 Revolution of Creativity

Creativity is one of the most desirable personal features of the 21st-century employee. Although, it had not been in the limeclight for a long time after its evolution in the 1950s, research conducted on its nature is in the focus of attention again. Decades ago creativity was identified by different features. Some of the researchers emphasized the importance of the creative product while others that of creative personality or the creative process. Brogden and Sprecher (1959) laid the emphasis on the individual or cultural novelty of the product. Simonton (1978) took a stand not only on its originality but its applicability as well. Guildford thought that it might indicate a psychological product and a product appreciated in the culture (Vincze&Márton, 2004). Czeizel (2004) highlighted that creativity seems to be an innate character that can be either developed or suppressed by the social context. Csíkszentmihályi (2016) confirms this when he states that creativity is a phenomenon at a system-level and not an individual feature since it emerges in the interaction of people's thoughts and sociocultural environment. He also adds that the likelihood of creativity appearing by changing conditions is a lot bigger than by trying to make people think more creatively. Educators are said to be highly responsible for the evolution of creative ability in students' minds,

although its relation to other intellectual markers such as intelligence is still unclear. While Michalko (2012) states that a high level of intelligence does not assume that of creativity and vice versa, Srinivasan (2007) emphasizes that fluid intelligence may have an important role in it. Silvia (2008) found that intelligence might be predicted by two components of creativity: originality and fluency. Ghonsooly and Showqui (2012) assume that a minimum level of intelligence is necessary to reach a certain level of creativity (Ghonsooly&Showqi, 2012).

1.3 Evolution of CLIL in Hungary

Intelligence (in particular reasoning ability) is also inevitable for mastering a foreign language. (Hulstijn, 2015) Even though the vast majority of the parents in Hungary forsee the importance of second language knowledge in their children's future, they are not familiar with the personal abilities underpinning success in it. Since the escalating number of dual language programmes (which have high social value for parents and can achieve high levels of language and subject knowledge), cannot guarantee it, either.

Many influencing factors might contribute to success in L2 such as socioeconomic status, teacher L2 ability, teacher pedagogical skill, time allocation, the language syllabus, exposure and last but not least learners' literacy and cognitive skills. It is widely known from research that learners with good L1 literacy skills and academic language proficiency have the goods on learning in L2 since underlying academic language skills learnt in one language, can be transferred to the other (Cummins, 2000). However, learning through a language is more demanding for students, it guarantees higher exposure to the second language which is said to be crucial in mastering it (Ball, Phil, et.al., 2015). This is the reason of the high popularity of CLIL programmes in Hungary which is at the leading edge on a European scale (Trentinné, 2014). CLIL is defined as "*an educational approach in which a foreign language is used as the medium of instruction to teach content subjects for mainstream students*" (Nikula, et al., 2013). These programmes are initiated from the first school year and in the following years there are 8-10 lessons (30-50 % of school subjects) taught in the target language (English) weekly. By the end of the eighth grade pupils are thought to be able to perform the language at intermediate level. The final advantage of these programmes is the promotion of students becoming bilinguals at a relatively early stage.

Bilingual learners can be defined using different criteria such as language dominance, the sequence of acquisition, the onset of L2 and the preferential domain of language use (Li, 2000). Carmen Muñoz (2012) points out that while young children may be superior to older learners at implicit learning, it requires massive amounts of input that a typical foreign language setting cannot provide. Furthermore, any age-related decline in second language learning capacity varies from person to person and from one aspect of language to another and motivation, perseverance and good results in second language learning can, in fact, be

achieved at any age. However, those individuals, who simply ’learn’ the second language seem to learn them endlessly, never getting to the state of ’having learnt’ it (Singleton&Cook, 2014).

Bilingualism as a phenomenon is also divisive and has many aspects to be viewed from. There are many controversial data about the possible positive or negative outcomes deriving from it, hence as a cognitive state it is a long-debated one.

Some researchers emphasize the higher level of executive control (switching attention and working memory) compared to monolinguals (Bialystok, 2012) while others argue the existence of the degree of this advantage (von Bastian, C. C. et.al., 2016). CLIL helps learners to apply, integrate and transfer knowledge while fostering critical thinking (Duverger, 1995 cited in Gravé-Rousseau, 2011). Gajo and Serra (2002) (cited in Gravé-Rousseau, 2011) found that bilingual students tend to adopt a more analytical approach to learning and they are able to apply it at a higher level when facing new learning situations compared to their monolingual peers.

Other researchers focus on the positive changes enhanced by the bilingual state. Kovács (2014) refers to results showing that they are fluent, reliable listeners and communicative speakers who are eager to speak without switching between languages. They are able to logically infer unknown words and use more gestures than usual. Bilingualism also helps children to understand other people’s different perspectives. Besides focusing attention and switching between tasks easily bilingualism also has advantages for literacy. Bilingual children begin discovering alphabetic scripts easily because of their greater sensitivity to language. Bilingual children have a greater faculty for creative thinking at their disposal. They perform significantly better in tasks which require not the finding of the single correct answer to a question, but where they are asked to imagine a number of possible correct answers (Beardsmore, 2008).

1.4 CALL for CLIL: Use of Digital Technologies for Promoting Language Learning

Conscious improvement of ICT literacy in lessons different from ICT is not a general practice in Hungary. Even though, there are efforts made by the government (http://hirmagazin.sulinet.hu/hu) to promote the application of new methods in the classroom context, the process is still in its infancy. Huge differences between teachers’ adoption or refusal of technology can be observed which may vary from region to region and even from school to school. Experienced teachers often report on lack of students’ task-orientedness and easy distraction of their attention. To avoid these side-effects careful measures, clear requirements and tasks should be outlined by the teachers to manage a good digitally-assisted lesson (Abonyi&Turcsányi-Szabó, 2015).

However, guiding multimedia input in CLIL is another problematic issue for many reasons that are not going to be detailed here (authenticity, relegated linear

texts, purposefulness of texts, lack of collaboration among teachers), it seems unreasonable to avoid it in the 21st-century classroom. CLIL teachers face a huge amount of sources to choose from but picking up the best-matching materials to their objectives is always time-consuming and exhaustive. Contrarily, self-serving browsing is not adequate for learners at all, since they need to have their learning facilitated and guided with well-described and defined tasks (Ball, Phil, et.al., 2015).

A different aid to speed up children's second language competences with the help of digital technology is CALL (computer-assisted language learning), although there is less evidence of its positive impact than with CLIL (Knoerr, 2005).

Kongrith and Maddux (2005) suggest that certain characteristics are necessary in CALL to make it work successfully in the classroom context: provision of a high degree of interactivity between computer and learner and that of users' control while providing the possibility for the accomplishment of highly complex and relatively more creative tasks. CALL might enhance learners' motivation, reduce learner anxiety, provide an independent learning environment, support learner autonomy and increase cultural awareness. However, strict pedagogical decisions should be made to balance CALL with other more traditional methods in the classroom to avoid students becoming distracted by the irrelevant material. (Casado and García, 2000). Pérez Torres (2002) suggests that the use of CALL should be limited to one hour in a four-hour weekly session.

Different forms of CALL are found to be efficient in educational settings to some extent. Text-based computer-mediated communication encourages collaborative work, promotes attention to linguistic forms, prepares for oral communication. (Alwi et al., 2012) As for electronic dictionaries, moderate evidence has been found: learners complete tasks faster with than without technology (Golonka, et al., 2014). However, this does not guarantee a speed up in understanding as well.

Evidence has been found on the positive impacts of the application of meaningful and engaging games-based methods on problem-solving and critical thinking abilities. Computer-mediated communication (chat) increases the amount of learners' language use and its complexity but does not have a huge impact on speaking proficiency (Golonka, et al., 2014). On the other hand shy students showed increased participation and language production while being exposed to computer-assisted classroom discussion (Kelm, 1992). Many foreign language scholars such as Throne (2008) take a stand on the integration of massively multiplayer online games into the foreign language classroom emphasizing the rapid growth of use of these games among adolescents and the rich opportunities they might offer 'for immersion in linguistic, cultural and task-based settings'.

The boundaries among fictional world and real world surroundings seem to merge due to different applications, programmes and special peripherials that give the sensation of full immersion. It is not that difficult to visualize how they can promote language learning among adolescent learners. For example LangAR is a foreign language phrasebook which supports real-time contextualized vocabulary learning. With the help of it the learner can take a photo of an object which is immediately identified by the computer in the target language (Goodwin-Jones, 2016). Due to these innovations some questions might pop up in a teacher's mind. How will the nature of language learning change in the future? How will methods be adjusted to the changed conditions? How long will formal and personal teaching methods exist? As it might be clearly seen, the rapid development of technologies require different attitudes towards teaching and learning from language teachers. Since drill and skill practices are predicted to be taken over by computers, teachers will need to place the emphasis on factors like cultural context, intercultural communication and personalized learning experiences (Haugh, 2017).

Language teachers today while focusing on improving their students' skills might feel confused at the sight of available teaching methods or materials. On the one hand, they might heave a sigh of relieve since the assumptions of multilingual people thinking in different ways which are suited to the sorts of competencies necessary for the future are surely confirmed by now (Ball, Phil, et.al., 2015). On the other hand, it is unpredictable at the moment how far the use of digital technologies will lead us in the future. Till then moderation in every aspect of teaching is supposed to be the best option.

2. Methodology of research

2.1 Aim of the study

The study was designed to confirm the assumption that students who are learning according to a dual-language syllabus and are regularly (on a weekly basis) exposed to digital materials in a 1:1 learning environment, have improved creative visual and verbal abilities and are more conscious about their daily ICT use compared to students with no regular exposure to CALL (computer-assisted language learning).

2.2 Participants

Stratified (convenient) sampling technique was applied as a basis for selection among students. The basis for stratification was the number of the English lessons.

The current research was administered in a primary dual-language school in a country town in Hungary. The two groups of learners (N=13 és N=19) are studying according to a dual-language syllabus, hence both have five English lessons a week of which one is held by a native speaker teacher. Some of their school subjects are taught in the English language: History, Geography and Civilization. Students have been learning English since the first school year. One

of the groups (with 19 members) serves as a control group. In their English language classes, there was no weekly exposure to the English language via CALL. In these classes learners in the experimental group worked in a well-equipped computer room with individual access to computers (in 1:1 learning environment).

2.3 The applied method and test types

The analysis of the data is processed in accordance with the quantitative research paradigm. The possible scales and data types are defined first then the applied statistical operations are set. The characteristic features of the variables are analyzed with the help of descriptive statistics.

2.3.1 Test of Circles

The methodological background of the analysis consists of three tests: Test of Circles (Torrance, 1962), Alternative Uses Test (Guildford, 1964) and The ICT questionnaire (Dorner L. et. al, 2016). Both creativity tests are still widely used for measuring creative ability, but the two tests are different in terms of skills that are necessary to complete them, and this fact is important to take into consideration. Test of Circles is a visual test requiring drawing skills.

Participants were asked to create recognizable pictures by using the given circles. The circles were required to be central parts of the pictures. Students could draw in the middle, outside or on the lines of the circles which could be connected as well. Creation of drawings that nobody might have thought of was the main criterium. Participants had to keep the time limit of 10 minutes.

2.3.2 Alternative Uses Test

The reason for selecting two different test types was the decreasing number of students who aret engaged in drawing. A visual and a verbal test seemed to be substantial to make the experiment more informative. Alternative Uses Test serves as a verbal test laying emphasis on the versatile nature of creativity. In this test, participants are requested to list non-obvious uses for a common object (a chair in this case) in a fixed amount of time (5 minutes).

2.3.2.1 Evaluation of creativity tests

In both tests the responses are evaluated on three components: originality (uniqueness of ideas), fluency (the number of solutions) and flexibility (shifting among the groups of solutions). In the visual creativity test participants might gain extra scores for connecting circles (one score was given for each picture with connections).

2.3.3 ICT questionnaire

The ICT questionnaire (Dorner, et. al, 2016) contains mostly Likert scales revealing students' attitudes, accessibility and timing of ICT devices at home and at school. It also gives a general overview of the number of devices per household and the activities done with the use of them. The questionnaire which is prepared for students aged 10 to 18 and based on self-assessment consists of 42 items. We used a five-grade Likert-type scale for most of the questions.

3. Results and data analysis

Regarding learners' general use of digital devices outside of school, data show that students spend a lot of time in front of the screen: 25% of them 1-1.5 hours, 16% of them 2-3 hours and 12% of them spend more than 5 hours in front of the computer screen on weekdays. At the weekend 40% of the participants spend more than 5 hours, 18% of them 3 to 4 hours and 18% spend 2 to 3 hours with digital devices. Neither the experimental nor the control group is monitored consistently by the parents regarding the use of digital devices with internet access. Parents never monitor 63% of students in the experimental group and 33% in the control group. 7% of students in the experimental group and 21% of students in the control group reported about rare control on their daily online activities.

There is no significant difference between the attitudes towards ICT use between the two groups. Students in both groups like using digital technologies at the same level, however, the non-CALL (control) group students report on a higher level of anxiety in the lack of internet or digital devices. They also report on a higher level of tension if interrupted compared to the experimental group. The average number of digital devices in the two groups are: 8.5 in the experimental group and 9 in the control group.

Nearly half of all participants use ICT devices for helping each other with learning, exchanging learning materials or editing PowerPoint presentations regularly. As for entertainment, again, high correlation has been found between the use of Skype and online gaming which might point out the students' involvement in different social settings.

Students use ICT devices mainly for entertainment in the Hungarian language: 80% of them listen to music, 82% of them search for information, 80% of them watch videos or films and 80% of them play online games. They do not take notes, buy things online, check emails, write comments or edit their social network profile very often. Only 40% of the students report that they always use ICT devices for language learning purposes. One-fourth of the participants use their smartphones more than once every day and nearly one-third of them every day for learning purposes.

Difference has been found between the two groups regarding the average time spent on digital devices at the weekend and on weekdays. Members of the experimental group use digital technologies for about 1.5 hours on weekdays and more than 3 hours at the weekend. Control group members use these devices a bit

more often: they spend nearly two hours on weekdays and almost four hours at the weekend in front of the computer screen.

There is a slight difference between the two groups in terms of online activities done in their L2. Students in the experimental group seem to be a bit more conscious about their online habits, they watch films, learn and write blogs in English more often compared to the control group. Students in the control group use the internet and chat functions of computers more frequently compared to the experimental group and this might lead to their fragmented attention and lack of engagement in school activities requiring linearity in thinking.

As for the visual creativity test, students wrote words from 18 different word categories. These include drawings connected to beings, food, toys and symbols at the highest number, things that are easily accessible in their lives and are in the focus of their interests.

In the Alternative Uses Test, 9 main categories were created: sport-, garden-, danger-, height-, hiding- related words or holders, toys or furniture. This latter category was over-represented in the solutions with eight different words, however sport-related words and holders were both preferred. This fact might reveal that students could hardly abstract from the objective reality. There is only one category which is represented in both tests: toys, but while in the visual test students drew many toys, in the verbal test, only two were mentioned. This fact also confirms that flexibility in thinking might be different in dissimilar settings.

There are differences found in terms of fluency between the groups. Participants in the experimental group were able to draw half of the pictures of the control group in the Test of Circles, although they shifted among ideas a bit more often. However, in the Alternative Uses Test members of the experimental group towered above the control group in fluency, and their scores showed slightly better results both in flexibility and originality. Generally, it can be stated that students found it less difficult to think creatively in drawings than in words.

Our data show that 23% of the students of the experimental group and 11% of the students in the control group were able to achieve high scores (above 50 scores) in creativity tests. Students with the highest creativity results from the experimental group spend 1 hour on weekdays and an average of 2 hours at weekends in front of the computer screen. Students from the control group use digital devices for 1.5 hours on weekdays and about 2 hours at weekends, so there is no significant difference between the individuals with the highest creativity results and their daily ICT use in the groups. This fact might confirm the assumption that moderate use of info-communication technologies neither hinders nor promotes visual or verbal creativity.

4. Discussion

Our hypothesis that students who are learning according to a dual-language syllabus and who are exposed to digital materials in a 1:1 learning environment on a weekly basis, have more improved creative visual and verbal abilities and

are more conscious about their daily ICT use compared to students with no regular exposure to CALL (computer-assisted language learning) seems to be partly justified. Results suggest that the experimental group members who are less exposed to digital devices at home and do well-planned computer-assisted activities regularly (on a weekly basis) at school, use computers less often and more consciously outside the classroom compared to the control group.

Results of general ICT use among teenagers in this study are in accordance with those of scientific literature: most of the students do not need permission for using computers or internet and can use them unrestrictedly in terms of time and quantity as well. They spend as much time in front of these devices as the average Hungarian teenagers (7.6 to 19.7 hours per week). Most of them use these devices for entertainment and time spent on learning while using them is unnoted.

Results of Hungarian teenagers show that frequency of ICT use contributes to better reaction times in some types of cognitive tests requiring visual skills like visuo-spatial memory or mental rotation. Verbalism is the only area where rare ICT users (with equal or less than 7.6 hours of use per week) have significantly better results. Verbal expressivity is highly based on linguistic creativity. In tests like individual text creation or picture description, average ICT users have better results compared to the rare or frequent users. (Dorner, et. al, 2016). Participants in the experimental group tend to do online activities a bit more consciously. They write blogs and watch films in English more often compared to the control group.

Even though the total mean of scores show that there is no significant difference between the two groups regarding their general creative ability, participants of the experimental group performed better in the verbal creativity task compared to the control group. These activities take more time and require focused attention from students hence they might improve students' task-orientedness and concentration which can result in better school achievements in the long run. Focused attention is also necessary to a higher level of creativity. Certain personality traits like openness and collectedness promote creative potential. Students of religious schools seemed to have a higher level of these features since they achieved higher results in a self assessment test that was aiming the mapping of creative ability and putting the focus on personality features. (Tóth, L.&Király, Z., 2006).

However, as Csíkszentmihályi and Wolfe (2000) point it out, reaching high scores in tests measuring general creativity does not guarantee or betoken the level of future creative ability that is necessary in life or in certain areas of life. In contempt of the unclear nature of creativity, the application of tests measuring it, might contribute to the mapping of hidden potentials only. Real and socially acknowledged creative ideas cannot come into life without certain personality traits that are necessary to turn the idea into realization.

Even though the results seem to confirm that cautiously and consciously planned lessons supported by digital devices might have contributed to students' better engagement in tasks requiring fluency and originality of verbal ideas, a

more detailed description of participants' personal characteristic features seems to be essential in order to reveal further interrelations of the given phenomena.

5. Conclusion

Creativity is considered as one of the core features of a future employee in the 21st century. However, today's students are being educated for a future that nobody is able to foresee. Many of the existing jobs may disappear in a few years' time, and new ones will pop up. Instead of overwhelming students with theoretical information, the emphasis is being put on practicality and applicability of knowledge in education. This expectation has led to an ongoing paradigm shift in the Hungarian education and in the world as well. Even though creative ability (divergent thinking) requires well-founded knowledge that it might diverge from to give rise to the flow of novel ideas. In this process, students' background and circumstances have an influential role. This is why teachers need to cope with a new type of challenge that they are not prepared for, either. In the scientific literature divergent thinking is seen from many aspects, though it is often identified as fluid intelligence (which is a part of general intelligence) and is said to be a good predictor of creativity. In many parts of the world, info-communication technologies are seen as the possible solution for the problems in education. Shifting such a huge responsibility to new methods whose results nobody is familiar with, is hazardous.

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We acknowledge the financial support of Széchenyi 2020 under the **EFOP-3.6.1-16-2016-00015**.