photo: Dominik Mičuda - KEFA FMK UCM

Magdaléna Švecová

Location-Based Games as a Method of Teaching Seniors in the Field of Digital Technologies

ABSTRACT

Research on the education of seniors is a continually developing area of educational studies. However, current researchers emphasize the need for further exploration, due to ongoing social and civilizational changes, as well as the fast digitization of society to which seniors are not able accommodate very quickly. The author of this study will present results of research experiment named *LoGaSET* which is based on comparing two teaching and learning concepts: edutainment and the classic linear way of education. The concept of edutainment (including the use of location-based games as an educational method) is gaining popularity as a form of teaching. However, there are only a few studies verifying the effectiveness of its use. What is especially important, is that location-based games as an educational method are aimed particularly at young learners. Furthermore, it is not used in teaching ICT. That is the reason why the fundamental idea of the *LoGaSET* project was the creation of a course for seniors in the field of smartphones. This course was conducted using two methods: the class-lesson method and the location-based game method. After creating both didactic models and scenarios and testing them, researchers conducted educational courses for seniors at the local level. As a result, we can now assume some main conclusions regarding education of seniors in the field of smartphones based on the quantitative and qualitative data we observed during experimental teaching.

KEY WORDS

Digital gap. Digital immigrants. Edutainment. Linear teaching. Location-based games. Smartphones.

1. Seniors in digital world

Seniors living in the 21st century not only face the age-related life changes, but they also witness the fast digitization of society. The ageing process takes place on several levels. We know the physical, psychological and social aspects of ageing which possibly influences seniors' access to modern technologies in both positive and negative ways. According to genetic theory aging causes the weakening of the senses (hearing, sight, etc.), as well as the functioning of the muscular (arthrosis), digestive (teeth loss, low absorption of nutrients), nervous system (Alzheimer and Parkinson's diseases) body systems or others.[1] Seniors very often suffer from polymorbidity, which is the simultaneous occurrence of multiple diseases at one time.[2] Of course, these health complications have a negative impact on the lives of seniors, whether they need regular visits to doctors and hospitals, and it also affects the psychic condition of individuals, because not everyone is doing well with deteriorating health. Physical aspects of ageing also influence seniors' interactivity with new technologies, especially those with touch screens or small controllers.

As we mentioned above, ageing accompanies many life changes. Seniors often feel lonely, get bored as a result of retirement, or struggle with illness. K. Svobodová talks about increased density of important and serious events in the life of the senior, especially life losses (deaths of relatives, friends or acquaintances), as well as changes in housing, retirement and many other changes that accompany old age and which we have already mentioned in previous lines. The death of a lifetime partner can completely destroy the individual, but on the other hand many widows or widowers can live quality lives. Loneliness of a person after the death of a partner often leads to his/her relocation to a retirement home, as children do not care, do not know, or do not have time to care for a lonely relative. A senior in a retirement home knows he has moved there forever, feeling lonely, missing her or his life that the senior has led so far. On the contrary, there is also the possibility of finding new contacts in the home, replacing the deceased partner.[3] Digital communication technologies could help staying in touch with family and friends and also with rest of the world. Psychological aspects of ageing are largely related to social aspects. New opportunities resulting from the termination of economic activity should lead to the creation of new ones or the restoration of those that the individual did not have the time for during an active life. Life needs to be fulfilled by new programs and perspectives to prevent retirement crisis. All demographic forecasts predict population ageing in Europe in particular. That is why professionals and institutions are developing the phenomenon of active ageing.[4] In Slovakia, the concept of active ageing is still a distant to reality, as seniors understand the retirement age as passive spending of leisure time. Preparation for this period was until recently a concept that the seniors did not consider. For future seniors, it is appropriate to plan for retirement already. It is a positive attitude not only for the person himself, as he/she might avoid potential negative emotions such as sadness, boredom or acrimony, but also for society as the seniors will have the energy to use time efficiently. One of the best ways to spend time with seniors is to educate, not only in terms of personal development or enrichment, but also in the field of new knowledge in the field of technology.[5]

Although the lack of digital skills in seniors' lives may appear as a banality in the context of ageing, it is in fact a phenomenon whose solution would significantly improve the quality of seniors' lives and bridge the digital divide between generations. The digital divide is a phenomenon where a certain group of society has almost no contact with new technologies

[1] STUART-HAMILTON, I.: *Psychologie stárnutí.* Praha : Portál, 1999, p. 23.
[2] ZAVÁZALOVÁ, H.: *Vybrané kapitoly ze sociální gerontologie.* Praha : Karolinum, 2001, p. 23.
[3] SVOBODOVÁ, K.: Sociálně psychologické aspekty stárnutí. In *Demografie,* 2007, Vol. 49, No. 2, p. 91.
[4] STOJÁKOVÁ, M., PAVELKOVÁ, J: *Sociálny rozmer starnutia populácie*. [online]. [2018-01-28]. Available at: <http://www.prohuman.sk/socialna-praca/socialny-rozmer-starnutia-populacie>.
[5] Ibidem.

(ICT, Internet, smartphones), especially for financial, social, regional, educational or health reasons, but also because of higher age or absence of relatives, children and young people, who could teach seniors the basics. We are talking about the absence of digital literacy,[6] which is the ability to acquire and use technical and cognitive knowledge to use new digital technologies to use and search for diverse information. Digital literacy involves the proper use of computers, smartphones or tablets, and their software and applications, as well as safe Internet usage based on critical thinking.[7] The solution is training in this area, whether on the side of employers or at the public or social level.[8] We include seniors into the category of digital immigrants. The term describes current seniors who need to adapt to changes in society, based on digitization and technical progress, when so many offline activities are moving to online spaces. Within this division, we also distinguish a group of digital settlers (colonist) who lived in both analogue and digital times. They know how to use the Internet and their skills in using digital technologies are sophisticated, but they still rely to a large extent on traditional analogue forms such as newspapers, magazines, CDs, and more. [9] Better word for describing seniors in the new technological environment is the term digital strangers. G. Molnár, Z. Szuts and K. Nagy point out that digital immigrants are slowly becoming strangers in the sense of their attempt to be accepted by a certain group of people. As an example, the United States of America, where digital natives make up only ¼ of the population, but social components such as marketing activities, ICT companies, and a modern education system, puts much more attention on them. Others become either strangers, or they adapt to the situation, even though digital immigrants have just built up to the current world of digital natives. They will remain forever only as foreigners, immigrants.[10] This is also related to the theory of M. Prensky who gives some examples of digital immigrants' behaviour towards new media, which he calls accent - every immigrant who learns the language of the new country will always remain with a certain accent. In the case of digital immigrants, for example, they prefer to find information first offline before going to the Internet or reading lengthy instructions on how to use a particular program, as they would expect the program to teach them on their own. Digital immigrants prefer to print documents rather than read them on a monitor. This process of adapting to new technologies, or learning to learn new technologies and digital media, is like learning a new language. The foreign language, whose rules and vocabulary is acquired by a person later than in childhood, is deposited in another part of the brain. This is also the case with digital skills.[11]

2. Location-based games as an educational tool

Location-based games are based on the concept of edutainment. There are several definitions of edutainment that make up its overall profile.

- Edutainment is a learning program designed to promote entertaining learning through interaction and communication, as well as a learning by doing model.[12]

[6] VELŠIC, M.: *Digitálna priepasť v generačnej optike.* [online]. [2018-01-28]. Available at: <http://www.ivo.sk/buxus/docs//publikacie/subory/Digitalna_priepast.pdf>.

[7] *How to Define Digital Literacy*. [online]. [2018-01-28]. Available at: <https://online.cune.edu/defining-digital-literacy/>.

[8] VELŠIC, M.: *Digitálna priepasť v generačnej optike.* [online]. [2018-01-28]. Available at: <http://www.ivo.sk/buxus/docs//publikacie/subory/Digitalna_priepast.pdf>.

[9] PALFREY, J., GASSER, U.: *Born Digital - Understanding the First Generation of Digital Natives.* New York : Basic Books, 2008, p. 4.

[10] MOLNÁR, G., SZUTS, Z., NAGY, K.: *Digital Immigrants – Strangers*. [online]. [2018-01-28]. Available at:<https://www.degruyter.com/downloadpdf/j/auscom.2017.4.issue-1/auscom-2017-0004/auscom-2017-0004.pdf>.

[11] PRENSKY, M.: *Digital nattives, Digital Immigrants.* [online]. [2018-01-28]. Available at: <www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>.

[12] SHULMAN, J.L., BOWEN, W.G.: *The Game of Life: College Sports and Educational Values.* New Jersey : Princeton University Press, 2000, p. 82.

- F. Colace describes edutainment as a type of entertainment which aims to educate with the help of multimedia, internet, video, movies, digital games and games.[13] Buckingham also adds that these elements are based on visualization.[14]
- According to Charski, edutainment is designed to make the students learn to use the acquired knowledge by analyzing, evaluating and comparison. [15]
- E.D.Fossard thinks that edutainment is the use of certain methods to attract student attention for the individual development of the student.[16]
- M. Wang and colleagues think that edutainment should provide students with high-quality and well-spent time, and should also provide the experience that is needed in the real life.[17]
- Z. Okan adds that students should be interested in edutainment by themselves and it should (not?) enhance negative feelings towards learning.[18]
- According to A. Druin and C. Solomon, students should not only have fun, but they should learn something. [19]

We can assume that edutainment is playful education with a fun context that aims to teach with pleasure from entertainment. It should evoke pleasure, hold more attention and also encourage students to think or synthesize knowledge.

In addition to edutainment, gamification is part of location-based games. Gamification is the implementation of gaming elements, primarily from digital games into the non-gaming environment and has diverse goals. One of the goals is to increase the activity and productivity of employees or customers, but also to simplify various complex systems, physical training and, last but not least, the learning process.

Gamification has generally several layers at which it operates:

- raises the initiative,
- increases motivation,
- increases interaction with and among students,
- increases loyalty.[20]

With its positive effects regarding efficiency. gamification is having its use in education, marketing, mentoring, human resources or technology. [21] We can encounter gamification in the form of loyalty cards also in the purchase of products. A common implementation of gamification elements is points, rankings, levels usage in applications, organizations, or institutions.[22] But the gaming process works with much deeper meaning.

---

[13] COLACE, F., DE SANTO, M., PIETROSANTO, A.: *Work in Progress: Bayesian Networks for Edutainment.* [online]. [2018-02-03]. Available at: <https://www.researchgate.net/publication/224061273_Work_in_Progress_Bayesian_Networks_for_Edutainment>.

[14] BUCKINGHAM, D., SCANLON, M.: Parental Pedagogies: An Analysis of British Edutainment. In *Magazines for Young Children Journal of Early Childhood Literacy,* 2001, Vol. 1, No. 3, p. 284.

[15] CHARSKY, D.: From Edutainment to Serious Games: A Change in the Use of Game Characteristics Games and Culture. In *Games and Culture: A Journal of Interactive Media,* 2010, Vol. 5, No. 2, p. 182.

[16] FOSSARD, E.D: *Using Edu-Tainment for Distance Education in Community Work.* New Delhi : Sage Publications India, 2008, p. 19.

[17] WANG, M., ZUO, X. L: *Edutainment Technology – A New Starting Point for Educational Development of China.* [online]. [2018-02-03]. Available at: < https://ieeexplore.ieee.org/document/4417873/>.

[18] OKAN, Z.: Edutainment: Is Learning At Risk? In *British Journal of Educational Technology*, 2003, Vol. 34, No. 3, p. 257.

[19] DRUIN, A., SOLOMON, C.: *Designing Multimedia Environments For Children: Computers, Creativity And Kids.* New York : John Wiley and Sons, 1996, p. 56.

[20] *Introducing to gamification.* London : Association for Project Management, 2014, p. 9.

[21] ZICHERMANN, G., CUNNIGHAM, CH.: *Introduction. Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps.* California : O'Reilly Media, 2012, p. 182.

[22] BUZOVÁ, K.: *Implementácia gamifikácie do knižníc s využitím sociálnych médií.* [online]. [2016-12-21]. Available at: <http://itlib.cvtisr.sk/archiv/2014/1/implementacia-gamifikacie-do-kniznic-s-vyuzitim-socialnych-medii.html?page_id=2618>.

Neuroscience claims that gamification creates an effect similar to gambling or other competitive activities, when the brain also produces feelings such as euphoria, pleasure and excitement, with the help of chemical substances such as dopamine responsible for the feeling of happiness and satisfaction considered as a natural system of rewarding the brain itself. Constantly rewarding the nervous system with dopamine encourages motivation, which makes the individual more involved in the activity.[23]

An important factor, which is actually the result of cooperation and the appropriate combination of gaming mechanisms, is primarily motivation. It goes side by side with fun, another characteristic feature of the game. Motivation is a psychological process that influences the intensity of our behaviour aiming at achieving goals. Likewise in games, motivation is the main aspect of the progress of individual players which we included into our experiment.

Edutainment	Linear teaching
winning possibility	no winning possibility
didactics are hidden, story is more important	didactics are clear
obstacles (drawing-off attention on purpose)	no obstacles (no drawing-off attention)
game rules	only application explanation
students are in the centre of educational process, teacher is only a helper	teacher is in centre of educational process
role-play	students are in their social roles, they are who they are
city/public	classroom

SCHEME 1: *Differences between edutainment and linear (class method) teaching*

Source: own adaptation/LoGaSET project

3. Methods

First of all, we should define the most important goals of our research, as well as the purposes of our activities under the *LoGaSET* project. The main objective of the research was to find out what form of seniors' teaching and learning in ICT, specifically smartphones, is more effective among seniors and also suits them the most in various scenarios. The main goals of this phase of research were:

- comparison of traditional and edutainment teaching and learning,
- evaluation of the strengths and weaknesses of both educational approaches,
- formulation of advice for potential educators trying to enhance elderly peoples' skills related to smartphone use.

Generally, we wanted to set basic rules for seniors' teaching in the field of smartphones and to describe the whole experience of their learning process. The main research method was an experiment that consists of implementing mobile application education training for seniors over the age of 62 years into practice. The course took place simultaneously over 10 days, with 20 seniors randomly divided into two identical groups, one being taught through the games and edutainment we described in the second chapter and the other by traditional classroom methods. During gamified lessons, seniors were taught in non-classroom areas using games that made them use various mobile applications to complete quests. On the other hand, the linear class had a strict schedule based on verbal explanation and exercises.

[23] *Introducing to gamification.* London : Association for Project Management, 2014, p. 11.

We chose ten mobile applications to develop certain digital skills:

1. App Store/Google Play - installing applications - first class
2. Qr Codes Scanner - basics with touchscreen interaction - second class
3. Camera - taking a photo - third class,
4. Video - filming - fourth class
5. Dictaphone - audio import - fourth class
6. WhatsApp - communication - fifth class
7. Google Maps - orientation - sixth class
8. Cp.sk - orientation through public transport - seventh class
9. Google Translator - import of commands - eighth class
10. Trip Advisor - searching information - ninth class
11. Tenth class was dedicated to recapitulation.

Apart from that, we measured several quantitative factors in both experimental groups. At the beginning of the course, our educators interviewed seniors regarding their smartphone skills. Seniors were asked three questions with increasing difficulty regarding every application. They could answer negatively or try to accomplish tasks. Observers and educators measured the time of the whole interview and the number of questions seniors asked to fulfill tasks. At the end of the course, this process was repeated with slightly changed tasks. Seniors were also tested after every class on the subject they were learning the previous day. Again, observers measured the time to finish tasks and the number of asked questions. During the class, researchers were observing the number of asked questions related to the subject of the lesson by seniors.

We were also interested in seniors' impressions and feelings which they were facing during the whole course. After every class, seniors received questionnaires with five questions regarding their amount of fear, happiness and other emotions. At the end of the training, seniors also expressed their satisfaction with the whole course: whether it fulfilled their expectations, what applications where the most useful (or least) and whether their emotions were positive or negative.

We also organised focus group interviews with both groups as well as with educators and researchers to receive more qualitative data.

It is important to say that the whole research lasted two years and was organised in four European countries. This study is only describing the Slovak experience and only the third stage of research which was conducted using the following steps:

1. Preparation stage: partners planned location-based games, traditional method. They also tested games in real life and made changes.
2. Pilot stage: testing of games and research tools with 12 seniors.
3. Main stage: training of educators and observers, experiment implementation,
4. Evaluation of experiment.
5. Preparing Good Practice Book and organization of Multiplier event for future educators in this field.

4. Results

In this chapter we will try to summarize the most important and significant results of the research. First of all, we would like to present how seniors reacted during the classes and games. The table below shows how many questions seniors asked during the teaching on average. It has to be noted that both groups received manuals on how to use applications.

Method	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Average per day
LBG[24]	6,36	7,54	8,27	4,36	16,09	10,54	11,27	6,54	6,27	9	8,62
CLM[25]	10,22	2,22	5,33	5,44	9,77	10,33	2,33	4,11	9,55	9	6,83

SCHEME 2: *Average amount of asked questions during training by method*
Source: own adaptation

Seniors taught by game methods asked about two more questions per class than their class method colleagues. We can assume that seniors received more detailed explanations about particular applications during the class method of learning. They also had more time and space to read instructions and manuals about how to use applications. On the other side during location-based games, seniors had to concentrate on the game and did not have a calm space to get to know applications. They were asking educators during playing as they could not continue the game due to a lack of ability to control the application. According to asked questions, the most complicated application for seniors is WhatsApp as they asked 16 questions in the LBG method and 10 questions in the CLM method. The second most difficult one is Google Maps. During the last lesson dedicated to recapitulation, seniors in both groups asked 9 questions on average which is quite a good result.

We were also interested in seniors' ability to remember new skills from previous days. After every lesson or game we proposed them individually to accomplish a simple task.

LBG	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Average
Questions	3,81	2,63	1,45	2,00	2,45	1,54	1,00	0,09	2,72	1,96
Time	138,09	48,36	21,90	67,72	68,18	84,27	84,45	42,90	113,36	74,35

SCHEME 3: *Amount of asked questions and time (in seconds) of handling control tasks in location-based games*
Source: own adaptation

CLM	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Average
Questions	3,33	3,22	1,77	1,55	2,33	2,00	2,00	1,22	2,00	2,15
Time	537,44	374,11	51,33	63,77	200,88	469,44	240,66	74,44	137,55	238,84

SCHEME 4: *Amount of asked questions and time (in seconds) of handling control tasks in class method*
Source: own adaptation

This data shows that regarding method effectivity, location-based games prove their meaning. Seniors in gamified groups asked less questions but not significantly less. What is more important, is that seniors in the class method needed more time for accomplishing each task. It means that they had to think more about every step in a particular application. They were not prepared for real smartphone usage in real life and they were slow. On the other hand, seniors from the edutainment group could handle tasks easily by themselves without

[24] LBG - location-based games
[25] CLM - class method

any help. They remembered how to control applications more in detail and they did not rely on the help of lecturers. Regarding recapitulation of all skills, the most difficult applications were Google Play or App Store because they were the very first applications seniors learned how to control and they did not have developed digital skills very well at that time. In the gamified group, it was also Trip Advisor which has many functions and it was the last application. We think the game designed for Trip Advisor was effective, so the main reason for bad results is fatigue from the whole course. In the class method, the second most difficult application was Google Maps, which is also a very complex application. The reason why is that seniors did not train on the application in real life like the edutainment group. The same reason is also related to QR codes. We consider interesting that the Whats App application which took a lot of energy to teach as well as to learn because of the complicated user interference was not such a problem for seniors.

When we have a look at post tests results, they are different than with the day to day review tasks. While average time of post-test in the location-based games group is 1805,53 seconds, in the class method group it was only 1638,11 seconds which is approximately two minutes difference. An even bigger difference occurs among asked questions during the post-test. Members of the edutainment group asked 15,9 questions per member (average). Class method participants asked only 4,22 questions per senior. Our hypothesis, that location-based games are more effective methods was not accurate regarding long-term memory.

Describing seniors' emotions during the course, we need to admit that they did not differ under the teaching method. Participants from both groups were feeling strong emotions during lessons and games, mostly fear, nervousness and on the other side joy from learning something new. The edutainment group described their learning experience as funny and with the opportunity to socialize. On the other hand, under the class method there were not such many possibilities to socialize.

At the end of the course, we also asked for feedback which was quite positive. Seniors felt involved and creative and were feeling that they were learning something. The main positive of whole course is time spent with educators who had the patience which seniors´ families do not have. Advanced seniors improved their skills regarding smartphones and those who were only beginners got to know smartphones more in detail. They learned how to use applications but everybody at their own pace. According to participants, some applications were chosen well, others not, for example QR codes which are useless. They also prefer to learn how to shop and deal with current business online or edit photos. Some apps could be taught more in detail to learn all the functions, according to participants. On the other hand, seniors complained about the pace of the course, for some participants it was too fast, for some it was too slow. Some of the participants were slower and the rest of the class had to wait for them or educators did not have enough time for everybody. Seniors also noticed that the LBG lesson is not appropriate for people who have health problems limiting movement and educators should give more explanation before games to total beginners, as well. Students also recommend putting the course programme on the website to know the whole programme of lessons before it starts. Some seniors think that 2 hours a day is not enough as well as two educators are not enough for the group of ten people. For some seniors the two-week duration is a lot because of the active lives they lead.

Educators and observers agreed on several issues regarding seniors training in the field of ICT which are described in our next lines. The whole course is very good idea because it is devoted to an almost forgotten group in our society and also the course can teach seniors very important skills - digital competences. Socialization of seniors is a strong part of the whole course. Participants developed relationships, they had fun and they were supportive of each other. They also liked to be in touch with young people - educators. The connection of generations is a positive aspect. Seniors also liked gamified lessons because they were fun. They were very cooperative, especially in the LBG group because they had the same purpose

- to win. They did not consider playing in public as embarrassing. According to educators and observers, a strong part of the course was the fact that seniors had very strong motivation to learn how to control smartphones. In both groups it was the main goal of each participant. Educators and observers noticed that seniors learned a lot during the course, they improved their skills, even created relationships with their smartphones. They also highlighted repetition as a good aspect in teaching and learning. Also educators recommended that there is a need of smartphone basics´ explanation at the beginning of course regarding settings and knowing the user interference of a smartphone (get to know smartphone, icons).

The main problem of the course was that seniors were not divided into groups according to their level of digital competences but randomly, which slowed down the whole course. Some smartphones did not work properly, they were old or in bad technical condition which slowed down the whole training, as well. Educators and observers described a few negatives of both edutainment and class method training.

- Seniors asked questions with no connection with the subject of the lesson often.
- Some participant were very quick doing tasks and it demotivated others.
- Some of the games were too complicated to understand.
- There were a lot of papers to handle.
- Seniors had to conduct a lot of tests and surveys.
- Seniors are very demanding and asked a lot of questions.
- At the end of lessons seniors were rushing home.
- Lack of educators. Observers had to do educators´ jobs which might influence their research. Educators did not have enough time for every senior. Some seniors were jealous of the others (less skilled) because they had more attention from educators (especially in the CLM method). Some seniors needed educators only for confirmation if they did the task well.

Young educators liked most of all the time spent with the elderly population because seniors were happy and very thankful. They gave thanks for everything and they really appreciated the educators´ work. Educators gained respect for the older generation. On the other hand participants liked educators because they were patient, they had time which their children or grandkids do not have. Also they were blessed and found new perspectives spending time with young people. Participants had good relationships with educators as with their grandchildren.

On the grounds of a focus group with educators and observers we also designed several pieces of advice for future educators who would like to teach seniors how to control their smartphones.

1. Educators should play games before they teach them.
2. It is needed to explain how to use Browser, also which news app seniors should download and explain them what an advert is.
3. CLM and LBG lessons should be mixed. Firstly seniors should be educated traditionally in the class and then practice skills through games.
4. Seniors also should learn how to make payments via smartphone, how to read news or play games.
5. In the future we should pair educators with seniors to find out if there is a connection between educator approach and senior´s success.
6. Games should be connected with a story, difficulty of levels should rise. Some games were too complicated which influenced the learning process in negative way. For example games with WhatsApp or camera and voice.
7. Various user interferences of smartphone which makes teaching more difficult.
8. Touchscreen controlling can be upgraded by using a special pen for touch screen.
9. Knowing apps in all operational systems or apps´ diversity regarding operating systems.

5. Conclusion

Our research team aimed to find out how to teach seniors in the field of ICT, especially smartphones. Location-based games as a method of edutainment seemed to be efficient. But now we know that the best solution is the interconnection of class methods and edutainment. Seniors need to get explanations, learning new functions step by step. But practical aspects of location-based games are the best way to learn how to use smartphones in real life, stressful conditions and in public, not like in sterile classroom environments. There are three most important things during the teaching of seniors controlling smartphones. First one of all, patience. Seniors do not get enough attention from their children or grandchildren. If seniors have some problem withtheir smartphone, younger generations of relatives do not have time to explain certain features repetitively and they prefer to fix the problem instead of the senior. It is our duty to answer all their questions, explain the same thing multiple times without stress. The second most important rule is socialization. It is strongly connected with edutainment and gamification. Common goals to win and gain points or pass levels increase cooperation among peers and their team spirit. The second most important aspiration to take from this course was socialisation right after learning something new. We should support it as seniors do not socialize as much as they would like to. The third most important rule is to divide seniors into groups according to their skills and abilities. This will reduce time consuming explanations of the basic settings of smartphones. Also, it is important to start with teaching the basics, for example how to set up wifi, operational systems, how to multitask, how to write on smartphone keyboards etc. We also need to think about low motor coordination of some seniors. Special pens designed for touch screen controlling can help seniors to be faster and more accurate during screen tapping. The last idea is about senior education in the field of ICT. It is important to dedicate time and energy to this social group because seniors need to feel part of the new digital world, they should have the right awareness about technologies and get to know their useful application in real life.

Acknowledgement: *Magdaléna Švecová is a member of the project 'LoGaSET: Location based games as contemporary, original and innovative method of seniors' teaching and learning, supported by the European Commission and Erasmus+ with project number 2017-1-PL01-KA204-038869. This study is part of project's output.*

Bibliography and sources

BUCKINGHAM, D., SCANLON, M.: Parental Pedagogies: An Analysis of British Edutainment. In *Magazines for Young Children Journal of Early Childhood Literacy,* 2001, Vol. 1, No. 3, p. 281 – 299. ISSN 1468-7984.

BUZOVÁ, K.: *Implementácia gamifikácie do knižníc s využitím sociálnych médií.* [online]. [2016-12-21]. Available at: <http://itlib.cvtisr.sk/archiv/2014/1/implementacia-gamifikacie-do-kniznic-s-vyuzitim-socialnych-medii.html?page_id=2618>.

DRUIN, A., SOLOMON, C.: *Designing Multimedia Environments For Children: Computers, Creativity And Kids.* New York : John Wiley and Sons, 1996.

CHARSKY, D.: From Edutainment to Serious Games: A Change in the Use of Game Characteristics Games and Culture. In *Games and Culture: A Journal of Interactive Media,* 2010, Vol. 5, No. 2, p. 177 – 198. ISSN 1555-4120.

COLACE, F., DE SANTO, M., PIETROSANTO, A.: *Work in Progress: Bayesian Networks for Edutainment.* [online]. [2018-02-03]. Available at: <https://www.researchgate.net/publication/224061273_Work_in_Progress_Bayesian_Networks_for_Edutainment>.

FOSSARD, E.D: *Using Edu-Tainment for Distance Education in Community Work.* New Delhi : Sage Publications India, 2008.
Introducing to gamification. London : Association for Project Management, 2014.
How to Define Digital Literacy. [online]. [2018-01-28]. Available at: <https://online.cune.edu/defining-digital-literacy/>.
MOLNÁR, G., SZUTS, Z., NAGY, K.: *Digital Immigrants – Strangers*. [online]. [2018-01-28]. Available at: <https://www.degruyter.com/downloadpdf/j/auscom.2017.4.issue-1/auscom-2017-0004/auscom-2017-0004.pdf>.
OKAN, Z.: Edutainment: Is Learning At Risk? In *British Journal of Educational Technology*, 2003, Vol. 34, No. 3, p. 255 – 264. ISSN 1467-8535.
PALFREY, J. GASSER, U.: *Born Digital - Understanding the First Generation of Digital Natives.* New York : Basic Books, 2008.
PRENSKY, M.: *Digital nattives, Digital Immigrants.* [online]. [2018-01-28]. Available at: <https://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf>.
SHULMAN, J.L., BOWEN, W.G.: *The Game of Life: College Sports and Educational Values.* New Jersey : Princeton University Press, 2000.
STOJÁKOVÁ, M., PAVELKOVÁ, J: *Sociálny rozmer starnutia populácie*. [online]. [2018-01-28]. Available at: <http://www.prohuman.sk/socialna-praca/socialny-rozmer-starnutia-populacie>.
STUART-HAMILTON, I.: *Psychologie stárnutí.* Praha : Portál, 1999.
SVOBODOVÁ, K.: Sociálně psychologické aspekty stárnutí. In *Demografie,* 2007, Vol. 49, No. 2, p. 87 – 95. ISSN 0011-8265.
VELŠIC, M.: *Digitálna priepasť v generačnej optike.* [online]. [2018-01-28]. Available at: <http://www.ivo.sk/buxus/docs//publikacie/subory/Digitalna_priepast.pdf>.
WANG, M., ZUO, X. L: *Edutainment Technology – A New Starting Point for Educational Development of China.* [online]. [2018-02-03]. Available at: <https://ieeexplore.ieee.org/document/4417873/>.
ZAVÁZALOVÁ, H.: *Vybrané kapitoly ze sociální gerontologie.* Praha : Karolinum, 2001.
ZICHERMANN, G., CUNNIGHAM, CH.: *Introduction. Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps.* California : O'Reilly Media, 2012.

Authors

Magdaléna Švecová
Faculty of Mass Media Communication,
University of Ss. Cyril and Methodius in Trnava
Nám. J. Herdu 2, 917 01, Trnava
SLOVAKIA
magdalena.svecova@ucm.sk

She focuses on a number of topics such as media literacy and the development of digital skills for seniors. While working in the international *LoGaSET* project, she explored the appropriate way to train seniors on smartphones and mobile applications. She also deals with the changes and effects of traditional and digital journalism. She has published a textbook Web Journalism, which deals with this topic in detail. Magdaléna Švecová follows especially current trends in journalistic production, interaction, ethics and the way of work of modern journalists