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Computer games as a technique in the support of learning for seniors? The results of research

Ilona Zakowicz
Faculty of Pedagogy, University of Wroclaw
Dawid Street, 1, Wroclaw, Poland
E-mail address: ilona.zakowicz@wp.pl

Aleksandra Marcinkiewicz
Faculty of Pedagogy University of Wroclaw
Dawid Street, 1, Wroclaw, Poland
E-mail address: al.marcinkiewicz@gmail.com

Abstract

As noted byNail Selwyn, Stephen Gorard and John Furlong *Learning with technology is seen by many countries as a way of improving their collective human 'capital'*(Selwyn, Gorard, & Furlong 2006, p. i). Therefore, the article presents the implementation of the new technology (computer games) in adult education. The aim of the paper is to show the result of a pedagogical experiment which was realized in the University of the Third Age in the University of Wroclaw in the framework of the TANT project. In the article we present the transformation of civilization: Information Society, Knowledge Society and population aging which were the impetus for undertaking research on the relationship of new technologies and education of the elderly. Educational potential of computer games was presented. All steps of experiment were described. In the end we present results of research and conclusions.

Keywords: Educational experiment, pedagogical experiment, computer games, New technology, learning of elderly.

Using the method of pedagogical experiment it is possible to make a highly probable assessment of usefulness a different ideas in the field of teaching and education (Łobocki, 2010, p. 231). This method is an inspiration for searching for better educational solutions, and creative methods of work with children but also with youth and adults. Generally, the pedagogical experiment offers " a multiplicity of new solutions for improving the process of teaching, learning, upbringing or training" (Łobocki, 2010, p. 231). Therefore, it is the opportunity for direct experience of pedagogical practice, which has a huge impact on development pedagogy as a science. We believe that innovation, creativity and readiness to search for new educational and teaching solutions is a fundamental element of development in modern society. Furthermore, the rate of change of civilization and new social phenomena mean that importance of education is higher than ever.

In the context of these considerations we point to a few very interesting phenomena, which have a substantial impact on the shape of contemporary reality. First of all is the Information Society in which information is a fundamental element of socio-economic activities and changes. The IBM Community Development Foundation defines Information Society as: "A society characterised by a high level of information intensity in the everyday life of most citizens, in most organisations and workplaces; by the use of common or compatible technology for a wide range of personal, social, educational and business activities; and by the ability to transmit and receive digital data rapidly between places irrespective of distance" (*The Net Result – Report of the National Working Party for Social Inclusion*). This definition shows that information and management of it characterized a new type of society. Moreover, the new technology is used in every aspect of human life. It should be noted that knowledge is a very important pillar of Information Society. Furthermore, knowledge is fundamental for creation of the Knowledge Society, which is the next step for the development of society. Therefore, as noted by Peter Drucker- knowledge has special significance because access to information and education determine people's success and social positions. (Drucker, 1993, p. 90). Moreover, Nail Selwyn, Stephen Gorard and John Furlong draw attention to the educational potential of new technologies in modern reality which is reflected in this citation: "The information age presents many challenges for those in education and government. The need for the whole population to be able to access and use new technologies such as computers, the internet and digital television is often seen as crucial to establishing a skilled workforce and empowered citizenry for the twenty-first century. The potential of these new technologies to allow people to learn throughout the life--course is also seen as a ready means of establishing developed countries as learning societies'. Governments around the world have therefore set targets and developed policies to help all adults to learn, work and live with the support of information and communications technologies (ICTs)" (Selwyn, Gorard, & Furlong 2006, p.1). Authors stressed the importance of lifelong learning in Information Society.

Taking into account the above phenomena it can be concluded that the reality of twenty-first century is very complicated and multi-faceted. On the one hand, the dynamics of change is very interesting but it is also uncertain and unclear, so the life of people is unpredictable. This is due to the fact that various kinds of phenomena overlap each other and quickly appear, but also quickly disappear which reinforces the sense of chaos. Therefore the role of pedagogy as theory and educational practice is invaluable. Different kinds of educational process allow diagnosis of previously unknown phenomena and understanding of reality. Education enables us to adapt to the changing socio-cultural conditions.

Uwe Flick noted that sources of research interests are very different and depend on personal experiences, micro-social problems but also global processes which imply consequences for social policy (Flick, 2007, pp. 17-18). Inspiration to conduct what is described in title experiment was a desire to deepen reflection on old age in the aspect education and search for new methods of education "in old age". The aim of research was to answer the question whether computer games can be used as a technique to support learning for seniors.

The demographic changes that had been observed at the end of the XX century contributed to greater interest in the problems of the elderly, also - and perhaps primarily - in in their academic environment. The different kind of descriptions of old age and aging were appearing in the scientific literature but definition of these terms is not easy. Moreover, many researchers believed that is impossible create one definition of old age and aging because it is possible to examine only a certain regularity. It is result of the extension of research fields of modern science, but also the socio-economic conditions (Szarota, 2004, p. 23). Adam A. Zych noted that global aging is becoming an important challenge for modern lifelong learning and social systems whose task is to meet the changing social, cultural and educational needs of older people (Zych, 2012, p. 149). Therefore, the issue of old age is more and more popular in research.

As noted by Maria Straś-Romanowska in the phase of aging it is possible to acquire the knowledge, skills and shaping habits, attitudes and behavior, and thus it is possible to improve and enrich personality. This development is very important for old people because old age is a stage of new challenges and tasks. The main task of an elderly person is adapting to the changing conditions of life, and modifying these conditions according to their needs (Straś-Romanowska, 2000). In implementation of these postulates the idea of Lifelong Learning which is realized by formal, informal and non-formal education could be useful (Jarvis, 2004, pp.40-41).

One of postulates of elderly education is acquisition of resourcefulness and self--reliance where education in new technologies or knowledge economy could be helpful. Therefore, various initiatives to counteract digital divide are undertaken. An example is The University of the Third Age in the University of Wroclaw which conducts computer courses for seniors. ICT courses have different levels of sophistication and themes. Moreover, seniors are participants of international educational projects, whose aim is to counteract seniors exclusion. The experiment described below was carried out in one of these projects. It was TANT project (Third Age and New Technologies) implemented in the framework of the Grundtvig program.

Description of the experiment

This article includes analysis of educational experiment which was realized in The University of the Third Age in the University of Wroclaw. In line with the theoretical assumptions the goal of the experiment was to examine the learning process of seniors and the educational potential (or lack thereof) of computer games in education of the elderly. The education experiment is understood by the authors as a method for study of phenomena that are associated with upbringing, teaching and learning. These phenomena are created intentionally by the researcher under controlled conditions in order to understand the nature of these phenomena (Łobocki, 2011, p. 110).

Researchers of adult education suggest broad, multi-dimensional understanding of learning. therefore the authors proposed learning technique for seniors, constructed on the basis of strategic and commercial computer games. In the experiment the technique of parallel-groups was used (technique of comparison groups) of at

least two study groups. One of them is the experimental group- the independent variable (an experimental factor) is introduced to this group. The second one is a control group which is the reference point for the experimental group. Therefore, no independent variable is present which allows comparison of the results of these two groups (Łobocki, 2011, p.110).

As already indicated, a very important element of educational experiment is definition of the variables. In this research the independent variable is using **computer games** in learning of seniors. Whereas, the dependent variable is the **effectiveness of the educational process.**

Requirements for the implementation of learning supported by computer games

In the research we used as the method of learning for seniors: computer classes supported by strategic and commercial games. Therefore, before conduct experiment necessary was selection of seniors to research. Participants of research were seniors who had a basic level of knowledge of computers. For this purpose, the recruitment was made during which seniors had to demonstrate their knowledge of computers and internet. In this way we could measure the dependent variables in the initial phase of the experiment. It allowed us to choose a group of people which met the requirements. The next step of experiment was meeting with the trainer of computer classes who explained to the seniors the specifics of the computer course. Afterwards, participants were randomly assigned to groups (experimental and control). Both groups (7 people) carried out the same program.

Implementation of the experiment

The experiment was attended by 14 people- they were students of the University of the Third Age in the University of Wroclaw. They were assigned to two 7-person groups. The control group had lessons once a week, duration of 1 lesson: 45 minutes. They were computer classes, during which students were acquainted with Microsoft Office. During lessons students studied how to search for the necessary information on the Internet, sending e-mail, browsing social networking sites. Participants also expanded the knowledge of the new technologies, virtual communication and office equipment. The experimental group also had lessons once a week, but lessons lasted longer: 2 lessons (2x 45 minutes). During the first hour of classes they implemented the same program as in the control group. While the second hour of course was for computer games: strategic and commercial. Classes in both groups took place once a week and groups had the same teacher (trainer). The entire course contained 10 lessons. At the end of the research we measured the dependent variables.

Profile of participants

Participants of experiment were students of the University of the Third Age who took part in recruiting and over 60 years (60+)- person interested in new technologies.

Computer games

Theoretical analysis of strategic assumptions of computer games, which were put on websites of producers allowed us to conclude that in the experiment we should used strategic and commercial games[18]. The aims of these games are: learning to make quick decisions, solving problematic situations and improving the ability to think logically. These computer games are multidimensional, complex and diverse, so engaging in playing should bring measurable educational outcomes.

Seniors taking part in "computer brain gymnastics" in line with the producers, players, surfers have the opportunity to:

- absorb much more information and remember them for a longer time,
- play mode *multiplayer* (*online*) – with many players at the same time. This creates the opportunity to develop interpersonal skills, and improves communication skills,
- choice of language games, which can support language skills. The process of communicating with the online player also allows players to expand the circle of friends, and learn new and interesting things.

It may be noted that the games provide opportunities to development of a wide range of seniors skills. Therefore, it can be concluded that computer games have an educational dimension.

Justification for the choice of computer games

In the experiment were proposed strategic and commercial games. Thanks to them, participants of project were able to develop strategic thinking and gain knowledge of economics (trade). Producers and internet users believed that the chosen game allows improvement of ability of analytical and creative thinking, intuition, reflection, and coping with problems. Moreover, games improve manipulative skills and ability of using a computer.

The proposed strategy games present a varied level of difficulty in terms of the complexity of the interface and the tasks. Games are designed for groups with different levels of sophistication in the use of computers. Examples of games: „Farmerama", „ Zoomumba", „Anno 1701", „Ikariam", „Patrician".

As noted before, the computer games could have educational potential. A few aspects of learning by strategic and commercial games can be distinguished:

Technical aspects:

- Ability to use computer games (install the game, its saving, exiting the game).
- Strengthening and acquiring new competencies in computer skills.
- Improve knowledge in the use of new technologies in education, entertainment and everyday life.

Social aspects:

- Learning and experience of effective cooperation - developing team skills.

18 Staregic and commercial games:„Anno 1701", producr: Related Design, „Ikraiam", producer: Gameforge, „Capitalism 2" producer: Ubisoft, „The Guild 2, Piraci Starego Świata", producer: Head Studios.

- Preventing the digital divide.

Personality aspects:

- Develop creative thinking and creativity in solving problems.
- Development of social skills.
- Experiencing and strengthening the personal impact.

Educational aspects:

- Understanding and developing techniques for effective memorization.
- Maintaining mental activity.
- Developing spatial imagination.

Other aspects:

- Change in relation to computer games.
- Getting to know new ways of spending free time.

There is a multiplicity of aspects in which you can take advantage of games which shows great potential for programming the educational process. Computer games can not only used to teach ITC skills but also to develop social, personal and other skills by *tacit knowledge.* Therefore, taking part in lessons and using computer games at the same time it is possible to develop many skills at once.

Results of the educational experiment

Initially, people in the experimental group had mixed feelings in relation to computer games. Only two of the seven people had experience with computer games. Those people had a positive attitude to games - they encouraged other seniors to be active. In turn, people who had not benefited from computer games had a negative attitude towards them. Those seniors believed that these games are childish, do not develop any skills, waste time and are too difficult. Negative attitudes were the result of a lack of knowledge and feeling the fear of computer service- seniors feared that they can damage equipment. Another factor may be the fear of being the weakest in the group- they feared competition. In addition, the attitude of participants towards games was shaped on the basis of negative reviews in the media. It should be noted that at different stages of the experiment seniors changed their attitude towards games:

I step: the majority of the group showed a suspicion in relation to games,

II step: interest, asking questions-first independent attempts of playing at home,

III step: commitment- rivalry between the participants, a sense of "victory" and development.

IV step: commitment, high level of autonomy, lack of knowledge on the subsequent stages of the game was replenished independently: googles, forums. Spending free time to play, work at home.

It should be noted that in the control group, there was no change of attitude towards games. Seniors in the control group had an attitude which is characteristic for the first stage.

Not only attitudes were different in the experimental and control group. Differences are also evident in the behavior of the participants. Seniors in the experimental group rarely asked for help because they tried to use method of "trial and

error" to solve problems. In addition, those seniors tried to find the logical cause and effect linkages and represented a higher level of self-confidence and capabilities. Moreover, seniors in the experimental group showed a greater level of concentration on the task being performed and more likely than people in the control group to do homework. Participants of the experimental group to a greater extent competed with each other and they glorified their own achievements. It is worth noting that in this group was greater level of interest in working with the computer-seniors somewhat "by the way" broadened knowledge of computer. Furthermore, the experimental group was more integrated, and its members had a sense of being part of a group. Seniors in the experimental group were more spontaneous-often joked and commented on the interface and the tasks performed. It is also an important fact that the seniors were satisfied that they could boast in front of their grandchildren that they can play games. It is worth noting that the participants in the experimental group not only changed their attitude towards computer games, but also behavior. The results of the using computer games in education seniors are as follows:

- Games forcing quick reactions (reflexes) - therefore seniors have to repeatedly solve the problems alone - rarely asked for help, less fearful of damage to the computer or doing something wrong,
- Faster response time - performance of tasks,
- A positive attitude to classes,
- A positive attitude to new technologies,
- Seniors have learned to look for answers to their questions on the forums,
- Seniors learned to observe messages, balloons - drawing conclusions for further action.

Also, seniors themselves noticed the positive effects of participation in the experiment. They exchanged the following benefits of using computer games in learning:

- reduce the sense of e-exclusion,
- extending the knowledge of economics and trade,
- breaking the stereotypical, negative attitude to computer games,
- ability to use games: broaden the knowledge of computer operation,
- increasing self-esteem and motivation to achieve their goals in life,
- improving skills: communication, memory (memory training), to improve the efficiency of manual and intellectual tasks,
- sense of well-spent time: entertainment, fun, learning.

Observations of researchers and respondents' opinions have confirmed that computer games have a great educational potential and can be used to develop many areas of skills and abilities. Moreover, a very important aspect was a fact that using computer games reduces anxiety to technologies. It should be noted, that computer games motivate seniors to using technology and development of personal and social skills.

Problems during the experiment

There were also problems of ongoing research, which were both the result of the method used, the technique, but also the specifics of the research group. It should be

noted that the pedagogical experiment it is not carried out in the laboratory, therefore it is difficult to eliminate confounding factors. However, most of the problems in this study were result of the study group. We should be aware that older people are a very specific group. Below we refer to these elements, which we think were the most problematic, and they are:

- Negative attitudes of seniors to pre-selection when choosing people for experimental groups - the disappointment of rejection. Seniors often had a lower level of knowledge of computer operation than they declared.
- The negative attitude to selection of groups by random - seniors wanted to decide who will be in the control group and who in the experimental. Major importance was the "separation" of friends, because participants wanted be in a group with people whose they know.
- Absenteeism of seniors.
- Different levels of commitment.
- Diversified attitude to games and work at home.

Problems, which we experienced during the experiment are a source of information and show what should be improved in future studies. First of all, before the start of classes we should point to the benefits brought by computer games. This is important because seniors have a negative attitude to this kind of activity. Another aspect is the selection of the experimental and control groups. In both groups, classes should be attractive to seniors. thereby the participants will not disappointed. Moreover, seniors should not to know in which groups (experimental or control) they are located. What's more, the problem is the low turnout of seniors in the class. Therefore, we should pay attention to the motivation of seniors to take part in this kind of activities. a solution could also be the use of e-learning. Another important aspect is selecting a group of people, with similar skills in ICT. Very diverse groups in terms of these skills means that people with higher level of ITC skills slowly develop new skills, and those with lower skills are not able to keep up with the program.

Conclusions

The studies can draw interesting conclusions both in aspect of education, social and individual. Referring to the educational process, it can be concluded that computer games make this process more interesting. Moreover, the acquisition of knowledge takes place spontaneously- "in spite of himself". The use of this type of technique also helps to integrate theory and practice.

In the technical aspect, it can be concluded that seniors quickly mastered the computer service. The use of games in education reduces the fear of new technologies. Participants in the experimental group were able to use the web browser (accurately).

Studies also show that the use of games in education positively affects the atmosphere in the group. Games were a factor in a positive way, stimulating a competition in the group. However, the participants were able to cooperate when they had difficult task to do.

Using games in seniors education also affects the development of the individual. Participants had a higher sense of urgency, they were more self-reliant and self-

-satisfied. Computer games help in remembering new things, learning creativity and analytical thinking. The eye-hand coordination is also improved.

In summary, the proposed method can be used in teaching: new technology, foreign language (vocabulary), history (descriptions, maps), economics (basic mechanisms), management (risk management, human resources) and marketing. This kind of training supports mind and physical fitness. This does not prevent dementia, however, is an excellent form of stimulation- this technique improves concentration, sharpens mental acuity, improves memory and faster response time to visual and auditory stimuli. There is great educational potential in such techniques. We hope that this research will be an impulse for the development of methods to support seniors in learning.

References

Drucker, P. (1993). *Post-capitalist Society*. Oxford: Butterworth-Heinemann Ltd.

Flick, U. (2007). *Designing qualitative research*. London: SAGE Publications Ltd.

Jervis, P. (2004). *Adult Education and Lifelong Learning*. Theory and Practice, London- New York: Routledge Falmer.

Łobocki, M. (2010). *Wprowadzenie do metodologii badań pedagogicznych* [Introduction to the methodology of educational research]. Kraków: Oficyna Wydawnicza „Impuls".

The Net Result – Report of the National Working Party for Social Inclusion. (1997). Retrieved from http://www.locallevel.org.uk/uploads/8/2/1/0/8210988/netresult.pdf.

Selwyn, N., Gorard S., & Furlong J. (2006). *Adult Learning in the Gigital Age. Information technology and the learning society*. London-New York: Routledge.

Straś-Romanowska, M. (2000). Paradoksy rozwoju człowieka w drugiej połowie życia, a psychoprofilaktyka starości [The paradoxes of human development in the second half of life, and prevention of psychological old age]. In: B. Kaja (Ed.). *Wspomaganie rozwoju. Psychostymulacja i psychokorelacja* [Support of development. Psycho-stymulation and psycho-correlation]. (p.44-55). vol.2, Bydgoszcz: Wydawnictwo Uczelniane WSP.

Szarota, Z. (2004). *Gerontologia społeczna i oświata: zarys problematyki* [Social Gerontology and education: outline of issues]. Kraków: Wydawnictwo Naukowe Akademii Pedagogicznej.

Zych, A. A. (2012). *Poznać, zrozumieć i zaakceptować starość* [Know, understand and accept the old age]. Łask: Over Group.