Health and healthy lifestyle of seniors in digital society
Zdrowie seniorów w społeczeństwie cyfrowym

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Abstract

Basis: Healthy ageing is one of the major challenges facing Europe today, and for this reason it is necessary to improve knowledge to support the health of older people and life quality in the later stages of life. For effective use of the potential of the rising population of older citizens, it is necessary to focus on two basic areas - health and life-long education. Information technologies are being implemented in all walks of human life and it is expected that seniors shall use digital devices to cope with their everyday lives, including to access health information.
Objectives: The major objective of our research was to map the **"**education of seniors in the context of IT inclusion**"** in the geographical area of the Ostrava City Authority. Further to ascertain whether the state administration and senior organisations support the development of digital knowledge in such a manner that seniors are not digitally excluded and are capable of using digital technologies for a healthy lifestyle and health support.
Methodology: 1) The context and basis of the research was an analysis of the strategic documents - national programs for preparation for old age: 2003 - 2025. 2) Quantitative research methodology for the questionnaire survey technique with regard to the corresponding issues. 3) Quantitative research methodology - Interpretative phenomenological analysis (IPA). 4) Focus group with the objective to assess the risks.
Results: Based on analysis of the acquired data, to suggest a methodology for the education of seniors in SMART technologies in order to prevent digital exclusion and for seniors to adopt a positive attitude to digital technologies also in healthcare, which shall ease healthcare and positively contribute to life quality. The educational methodology shall also be applicable in the international context with regard to health support.

Key words: Senior, SMART technology, social inclusion, health, lifestyle

Streszczenie

Tło: Zdrowe starzenie się jest jednym z głównych wyzwań dla współczesnej Europy, w związku z czym konieczne jest poszerzanie wiedzy w zakresie wspierania zdrowia starszych osób oraz jakości życia na jego późniejszych etapach. W celu wykorzystania potencjału zwiększającej się liczby starszych obywateli należy skoncentrować się na dwóch podstawowych obszarach – na zdrowiu oraz na kształceniu ustawicznym. Technologie informatyczne są stosowane we wszystkich obszarach działalności człowieka i oczekuje się, że cyfrowe urządzenia będą wspierać życie codzienne seniorów, w tym dostęp do informacji dotyczących zdrowia.
Cele: Głównym celem przeprowadzonych badań było zmapowanie „edukacji seniorów w kontekście integracji informatycznej" na terenie Ostrawy. Następnie zbadanie, czy administracja publiczna i organizacje zrzeszające seniorów wspierają rozwój kompetencji

cyfrowych tak, aby seniorzy nie zostali dotknięci wykluczeniem cyfrowym i potrafili wykorzystywać nowoczesne technologie w zakresie zdrowego stylu życia oraz promowania zdrowia.
Metodologia: 1) Kontekstem i punktem wyjścia do przeprowadzonych badań była analiza dokumentów strategicznych: krajowych programów przygotowania do starości na lata 2003–2025. 2) Badania jakościowe z zastosowaniem techniki badawczej w postaci kwestionariuszy obejmujących badaną problematykę. 3) Metodologia badań jakościowych – Interpretacyjna analiza fenomenologiczna (IPA). 4) Grupa fokusowa, gdy celem była ocena ryzyka.
Wyniki: Na podstawie analizy uzyskanych danych zaproponowanie metodologii kształcenia seniorów w zakresie nowoczesnych technologii, aby zapobiec wykluczeniu cyfrowemu oraz zapewnić pozytywny stosunek seniorów do technologii cyfrowych, również w dziedzinie opieki zdrowotnej, co ułatwi im dbanie o zdrowie i będzie mieć pozytywny wpływ na jakość ich życia. Metodologia kształcenia w zakresie promowania zdrowia będzie możliwa do wykorzystania również w kontekście międzynarodowym.

Słowa kluczowe: Senior, technologie SMART, integracja społeczna, zdrowie, styl życia

Introduction

The ageing of the population is a global phenomenon to which the action strategy of the World Health Organisation (WHO) is responding with the concept of "ageing of the population in the 21st century". The objective of this strategy is to support the development of society for all age groups and maintain the life quality of seniors at a certain economic, cultural and social level. WHO introduced the term *active ageing* in connection with the prolongation of human life and the increasing number of older people. According to WHO, the worldwide ageing of the population means that society must change its approach to the integration of older people into society and consider them as a positive group. The concept of active ageing is based on the UN policies for seniors (1991). The main targets of the "active ageing concept" were and remain focused mainly on the fields of education, employment, healthy ageing and personal development. It concerns the multidimensional concept, which runs at the social and individual level, and also influences how seniors are perceived by society, and should lead to the break-down of ageism. Due to the ageing of the population and the higher number of seniors in society, it is necessary to create conditions for the equal and active life of seniors, systematically consider the issue of ageing and the issue of seniors in all aspects of their life, and develop intergenerational relations and solidarity, promote tolerance and understanding. (Online. https://www.mpsv.cz/cs/11696)

A the turn of the millennium, "Healthy Ageing" was defined in the WHO project as the "process of maximum utilisation of all opportunities for physical, social and mental health, which enables older people to actively and indiscriminately get involved in social events and have an independent and quality life". (Online. Healthy Ageing) For effective utilisation of the potential of the increasing number of older citizens, it is necessary to focus on the following areas: health, lifestyle, safety, social inclusion, life-long education. Health is a major priority for seniors and it is necessary to perceive it in the broader context. It also includes life-long education and knowledge of information/digital technologies (IT), through which seniors can gain a lot of important information and eventually communicate with their attending physician. Since 2003, the Czech Republic has been adopting strategic documents concerning preparation for old age. At present, the applicable document is for the period 2019 - 2025.

1 Objectives

Łukasz Tomczyk, in the study entitled “Seniors in the world of new media and the phenomenon of digital exclusion in the Visegrad Group countries”, focuses on describing specific aspects of the functioning of seniors in the information society in the Visegrad Group countries. The primary issue on which the study focuses is ‘what led to the creation of the phenomenon of digital exclusion in this region and also how this phenomenon affects the life quality of seniors. He handles the issue formulated in this manner by detailed analysis of the factors which are conditional for the existence of the digital chasm in the Czech Republic and Slovakia, Poland and Hungary (V4).(On-line. Tomczyk, 2015, pp. 83 - 95)

In 2018, IT provided a living for 28% of Czechs, mostly students (53%) and employees (35%). They most frequently improved their knowledge by self-study and attended official courses quite rarely. Younger people more frequently improve their computer skills as compared with older ones. For instance, half of the people aged 16-24 are working on improving own skills. On the contrary, only 7% of seniors aged above 65 do so. Acquisition of new skills on a self-study basis is more often characteristic of university educated people, i.e., 35% of them. Only 6 % of people with elementary level education try to improve their computer knowledge by self-study. People with university level education generally try to improve their computer knowledge more than people with elementary level education, and the difference between these two groups is big. 42 % of university educated people improve their computer skills (in any way) while it is only 6 % in the case of people with the lowest education. (Wiechetová, 2019. On-line. http://www.statistikaamy.cz/2019/08/cesi-se-do-pocitacovych-kurzu-nehrnou/)

1.1 Demographic forecast of the Czech Republic for the 21st century

For the entire second half of the 21st century, two and half times more seniors than children will be living in the Czech Republic. In 2019, the Czech Statistical Office issued after four years a new population forecast of the population of the Czech Republic, this time up to the year 2100, respectively, 1 January 2101. It based the forecast on the data from the Population Census in 2011 and the development in the population in recent years. The projection captures the history of practically all the living generations. The extension of the forecast period by 35 years as compared with the previous forecast makes it possible to capture the full history of even the largest generations born in the 1970s. In subsequent decades, the age structure of the population shall also change significantly. The irregularity of the current development, respectively, the shift of the numerically large population years toward retirement age, the expected further improvement of the mortality rates and also fertility below the threshold of simple reproduction is changing the age structure of the population of the Czech Republic toward rapid and significant ageing. According to all the demographic development variants, in the first half of the 21st century, the number of people aged 65 and above shall approximately double from the current one-sixth to one-third. Their number should reach its peak at the end of the 2050s and will be at the level of 3.2 million people as compared with the current 1.8 million. Although the number of seniors shall decline in the subsequent period, the numbers of seniors living at the end of the century should be significantly larger than at present. The age category of the seniors will thus be the only part of the population which shall increase in terms of numbers. The average age of the population in the Czech Republic shall thus rise from 41.3 years to 50.0 years. The index of ageing shall substantially increase in future. It shall peak as of 1 January 2063, when according to expectations the ratio shall be 277 seniors to 100 children (2019 - 113 seniors to 100 children). The state in which the number of seniors shall be 2.5 times more than children should persist for the full second half of the century. By the end of century, the population could be 13 to 42 % lower than it is at

present. Up to a third of the population shall be aged 65 and above. The ageing of the population must be considered as an irreversible process. (Štyglerová at all. On-line. https://www.czso.cz/csu/czso/ea002b5947)

2 Research methodology

2.1 Objective of the paper

The research focused on active (vital) seniors who voluntarily picked as one of their leisure-time activities education in IT technologies, which comprises an inseparable component of their healthy lifestyle. The research focused on implementation in practice, specifically the design of a methodology for educating seniors in SMART[1] technologies, which can be applied internationally.

2.2 Research objective

Map the education of seniors in the context of IT inclusion. For this objective, we defined partial objectives and research questions. The philosophy and global objective of the research was to define a strategy and basis for the education of seniors in SMART technologies, which can methodically be used universally, also on the international scale, as already stated above. The partial objectives of the research and the research questions were analysed based on practical experience in the geographical area of the Ostrava City Authority and its broader administrative district.

Partial project objectives

1) Analysis of the current situation of the use of SMART technologies.
2) Analysis of needs in relation to SMART technologies.

Research questions

1) How does education of seniors function at the local government level?
2) How does the state administration solve the education of seniors in SMART technologies?
3) How do senior organisations educate seniors in SMART technologies?

2.3 Research group / Respondents

The research sample consisted of three groups of respondents.

1) Officials who are responsible for community planning.
2) Organisations of seniors.
3) Community centres that provide education for seniors.

2.4 Methodology

Our objective was to comprehend the problem in depth, not in breadth, and for this reason we in the end opted to use Interpretative Phenomenological Analysis (IPA), although we are aware that this may be a matter for discussion. We mainly wanted to reflect the experiences of the respondents with the researched phenomenon (i.e., IT education) which is the basis of IPA.

Hendl states that the social world is so complicated that we should use interpretative methods and methods that ensure a perfect description of the situation. (Hendl, 2005) Due to the fact that we needed a combination of various research methods, we used IPA - Interpretative Phenomenological Analysis. IPA is phenomenological in that it strives to explore distinctive perception or explanation of events, situations and human experiences. (Hendl 2005, p. 22) IPA is considered an approach which provides more space for creativity and freedom of the research process than other qualitative approaches. It seems to be a suitable perspective from which we can view the qualitative data if we want to describe and interpret the way in which the bearer of the experience that is of interest to us attaches

[1] SMART: Self Monitoring Analysis and Reporting Technology

importance to this experience. It is also effective in cases where the subject-matter of the research is an unusual group, situation or source of data collection. The research question in IPA is how a certain individual or group perceives or experiences a certain situation with which they are confronted, and the way in which they attach significance to such an experience. (Online. Koutná-Kostínková, Čermák. 2015)

As Hendl states, qualitative research is done by longer and intensive contact with the field or situation of an individual or a group of individuals. These situations are usually banal or normal, reflecting the everyday life of individuals, societies or organisations. The main task is to clarify how people comprehend events in a given environment and situation, why they act in a certain way and how they organise their own activities and interactions. Qualitative research mediates the comprehension of a person's true experience. It helps in the detailed examination of how a person shapes the significance of their own experiences, which facilitates a deeper understanding of the researched phenomena. (Hendl 2005)

2.5 Research methods and tools

Within the research survey methodology, the following were used: analysis of documents of state provenance, quantitative research method - the questionnaire technique, qualitative research method - examples of good practice, focus group.

2.5.1 Analysis of documents of state provenance

Since 2003, the Czech Republic has been adopting strategic documents concerning preparation for old age. At present, the applicable document is for the period 2019 - 2025. Analysis of the strategic documents on the concerned issue - national programme for preparation for ageing 2003 to 2025:
2003 - 2007 National programme for preparation for the ageing of the population of the Czech Republic
2008 - 2012 National programme for preparation for the ageing of the population of the Czech Republic
2013 - 2017 National Action Plan / National Strategy for Support of Positive Ageing
2019 - 2025 Preparation strategy for the ageing of society (Online. Strategy for preparation of the ageing of society)

The national programme for preparation for the ageing of the population of the Czech Republic (2003) was based on the fact that ageing is comprehended as a societal and individual phenomenon, which requires the adoption of a comprehensive and long-term programme for preparation for the ageing of the population and fostering the interest of society and individuals in this issue. On 14 November 2001, the Government of the Czech Republic adopted Decree No 1181 to the "Proposal of the primary principles of the National programme for preparation for the ageing of the population of the Czech Republic". The first programme was adopted in 2003. (Online. https://www.mpsv.cz/cs/11696) It was based on international documents and became the basis for subsequent programmes and strategies.

The preparation strategy for the ageing of society (2019 - 2025) builds on the National Action Plan in support of positive ageing for the period 2013 to 2017. The purpose of this strategy is to formulate a strategic approach to the preparation of society for ageing, which is in principle a cross-cutting issue that applies to various areas of the life of the individual and society, and thus also to various areas of public policies. This framework should respond not only to the problems which apply to today's seniors, but also formulate preparatory measures for the ageing of society as a whole and thus include all age categories of the population. It is

necessary to realise that a large generation that will soon reach senior age lives in the Czech Republic and throughout Europe, and that it is necessary to systematically prepare for life in a long-lived society. (Online. Strategy for preparation of the ageing of society)

2.5.2 Quantitative research methodology

In the first stage of the field research, we used the quantitative research method, a questionnaire technique, which was used with regard to the corresponding issue and also for reason of relatively quick and direct data collection. The objective of the questionnaire survey was to obtain information about the utilisation of SMART technologies by seniors, also information about whether the city districts of the Ostrava City Authority organize IT courses for seniors and if so, how often, whether they have instructors and teaching facilities. In parallel with this research, a questionnaire survey was conducted in co-ordination centres for seniors.

2.5.3 Qualitative research methodology

The technique of the structured questionnaire - structured interview with open questions, which were carefully formulated, was used. The objective was to minimise the interviewer's influence on the quality of the interview. The questions to be examined during the interview were formulated. (Hendl, 2005)

2.5.4 "Focus group" method

This method was used to evaluate the risks of education of seniors, including education targeted at maintenance of their health, from all stakeholders: representatives of community planning of the Ostrava City Authority, representatives of organisations for seniors in the territory of the Ostrava City Authority and its broader administrative district. Further, seniors who are interested in educating their peers, i.e. "Seniors to seniors". The objective of both encounters was to evaluate the risk factors of education for seniors in SMART technologies and apply the results in the conceived methodology and e-learning text, whose major objective is to alleviate the impacts of digital exclusion on seniors.

3 RESULTS

3.1 Results of the analysis of documents of state provenance

The National Programme for Preparation of the Population for Ageing 2003 - 2007 recommended the implementation of the following ethical principles, which are the basis for further documents up to 2025.

Recommended ethical principles of preparation of the population for ageing

- focus on the elimination of the causes of inadmissible restrictions on fundamental rights and freedoms for reason of age,
- combat discrimination against and social exclusion of seniors,
- strengthen inter-generational solidarity and equality between the generations with the objective to ensure the independence, self-determination and dignified life of seniors,
- recognize the contribution of seniors to the family and society,
- adopt measures which would preclude the possibility of ill-treatment and abuse of seniors,
- foster an attitude of respect and compassion for the elderly in the younger generation,
- deepen the feeling of solidarity with the needs of the elderly,

- eliminate social and physical barriers and prevent the exclusion of seniors from public life,
- support active ageing, development projects focused on active ageing and old age. (Online. https://www.mpsv.cz/cs/11696)
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4.2 Results of quantitative research

a) City districts

The quantitative questionnaire survey in the city districts in the 1st stage comprised 16 questions which the respondents answered with different approaches, but none of the respondents answered all the questions. We made the following conclusions from the analysis of the answers: the computer equipment of the city districts did not pass the test, the technologies are quickly becoming obsolescent. Seniors prefer to work on their own computer devices. There is also a lack of instructors and educational methodology, as well as funds. Some city districts stated the following: a lack of volunteer activities in the area of education for seniors (help from volunteers, for instance, students in the teaching process). Several options exist in terms of awareness of learning opportunities: local newspapers, notice panels, websites, pensioners' clubs.

b) Organisations for seniors

More than 60 % of the organisations for seniors do not offer computer courses for their members. The organisations that offer them are encountering little interest from seniors. The largest number of seniors attending the courses are aged 70 to 75. In terms of age, the numbers of groups of seniors aged up to 70 and above 75 are almost equal. We also asked the question whether they teach seniors how to use SMART technologies for healthcare and social purposes, and did not get even a single positive answer. In some answers, it was only mentioned that they focus on searching for information that is useful in life, but without further specification.

The results of the qualitative survey helped us comprehend the situation in the field and was an important tool for the formulation of the questions in the structured questionnaire - structured interview with open questions.

4.3 Results of qualitative research

As stated above, we carried out 6 expert interviews, which validated the results obtained in the questionnaire survey, and also made it possible for us to focus more deeply on the uncovered problems. An example of good practice is the Archa Community Centre in Ostrava - Poruba, which serves seniors. It officially started operations on 1 October 2015 in the unused premises of the former Folk School of Art (Lidová škola umění). Residomo, which owned and continues to own the premises, reconstructed the premises jointly with other Ostrava companies, placed them at the disposal of seniors and pays for the operations. This community centre has its own PC classrooms and own instructor. At the same time, they welcome methodological assistance and e-Learning texts for teaching purposes.

4.4 Results of the focus group

Two meetings were conducted in 2019. The first meeting was focused on cross-sectional experimental validation of the applicability of the defined educational and learning methods, procedures and tools. The respondents welcomed the mobile classroom and agreed that they shall certainly contribute to the broadening of the opportunities for the education of seniors in IT since the computer classroom is one of the major obstacles to the education of seniors in SMART technologies. The PC classroom is a priority requirement in the hierarchy of the needs for SMART education. We successfully determined the hierarchy of educational needs:

1) mobile computer classroom,
2) e-Learning text,

3) continuous risk assessment,
4) meetings/training of instructors - acquaintance with new SMART knowledge.
At the second meeting of respondents, we analysed and expressed our opinion on the prepared educational method. We successfully uncovered the risk factors, which may be eliminated quickly.

4.5 Summary

The "focus group" was methodically the most effective. The representatives of all respondent groups met: community planning of the Ostrava City Authority; representatives of the city districts; organisations for seniors; representatives of organisations with which we conducted expert interviews, interested parties/ seniors who want to become instructors for seniors (who will be our respondents in the next stage of the research). We successfully extracted the substantial and specific aspects on site. It was important to evaluate the risks of education and discuss how to preclude them from SMART education. The objective was to use IT also for healthcare, a healthy lifestyle, safety, and e-Health information.
Subsequently (in 2020) an IT course for seniors shall be conducted to improve their instruction skills on which the evaluation research shall build.

4.6 Discussion

This research and its results build on the already carried out researches of the current research team. In 2009 and 2016/2017 research was conducted in which the objective was to map the offer of U3V educational programmes in all state universities in the Czech Republic. (Kutnohorská, Telnarová, 2018) The Life-long Educational Programme, Grundtvig, Multilateral projects was carried out in the period 2008 - 2010. Project name: Seniors' Education and Training Internet Platform - SETIP. Project Number: 141981-LLP-1-2008-1-CZ-GRUNDTVIG-GMP. The lifelong education program Grundtvig "Seniors' Education and Training Internet Platform" (SETIP), which was jointly solved by the Centre of Visualisation and Interactive Education (Centrum vizualizace a interaktivity vzdělávání (CVIV)) Ostrava, the University of Ostrava (Ostravská univerzita v Ostravě) and also organisations focused on the education of seniors in Portugal (RUTIS Almeirim), Slovenia (ZDUS Ljubljana) and Spain (CID Cartagena). The objective of the project is to contribute to improving the computer literacy of seniors in these countries. In 2010, the project was awarded the "Quality Seal" ("Pečeť kvality") on the occasion of the 10th Anniversary of the Grundtvig program, which was endowed by The Centre for International Services (DZS), The National Agency for European International Programmes.

4 CONCLUSION

Support for a healthy lifestyle according to the Ottawa Charter (1986) also includes steps to strengthen the skills and capabilities of individuals, under which IT certainly falls. The social comfort condition is emphasised in the health models, whose implementation is conditioned by the elimination of digital exclusion. (Kernová, Online).

Demographic ageing has grown into an irreversible process which is projected in many areas of social life. It is desirable to approach the given issue actively and take the necessary steps for its timely underpinning. The desirable steps also include SMART technology skills.

The topicality of our research is also supported by current events in healthcare in Ostrava. The Centre for Tele-medical Services has started operations within the Faculty Hospital of Ostrava. Through medical devices and modern technologies, tele-medicine allows physicians to perform remote monitoring of the health condition of patients, thus without the need for

their physical presence. Naturally, the patient must also master IT technologies. Digitalization will transform healthcare. (Online. Zdraví.euro.cz)
We are continuing in the research and shall carry out evaluation research in 2020, where we shall ascertain the experience of seniors with education in IT technologies and application of their knowledge in education for health and a healthy lifestyle. This is a multidimensional concept and one of our priorities shall be how they get health information such as prediction of a healthy lifestyle.

Knowledge for support of the health of older people and life quality in later stages of their lives is very important.

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References
[1] *Centrum telemedicínských služeb*. [Online]. [cit. 2020-01-20]. Dostupné z: https://zdravi.euro.cz/ve-fn-ostrava-se-otevrelo-centrum-telemedicinskych-sluzeb/?utm_source=www.seznam.cz&utm_medium=sekce-z-internetu
[2] *Evropský rok aktivního stárnutí a mezigenerační solidarity v České republice. 2012.* [Online]. [cit. 2019-03-03]. Dostupné z: https://www.mpsv.cz/cs/11696
[3] *Healthy Ageing*. [Online]. [cit. 2019-12-09]. Dostupné z: http://www.healthyageing.nu
[4] HENDL, J.(2005) Kvalitativní výzkum: základní metody a aplikace. Praha: Portál. ISBN 80-7367-040-2.
[5] KERNOVÁ, V.Co je podpora a ochrana zdraví. [Online]. [cit. 2020-01-20]. Dostupné z: file:///C:/Users/Asus/Desktop/podpora_20zdravi.pdf
[6] KOUTNÁ – KOSTÍNKOVÁ, J, ČERMÁK, *I*. 2015. Interpretativní fenomenologická analýza. [Online]. [cit. 2019-12-19]. Dostupné z: https://www.researchgate.net/publication/281745581_Interpretativni_fenomenologica_analyza/link/55f6d5fd08aeafc8abf5036c/download
[7] ŠTYGLEROVÁ, T. AT all. Stárnutí se nevyhneme. Český úřad statistický. [Online]. [cit. 2019-11-08]. Dostupné z: https://www.czso.cz/csu/czso/ea002b5947
[8] *Strategie přípravy na stárnutí společnosti 2019-2025*. Ministerstvo práce a sociální věcí ČR. [Online]. [cit. 2019-11-18]. Dostupné z file:///C:/Users/Asus/Desktop/Senioři%20podklady%2013.9.2019/Strategie-přípravy na-stárnutí-společnosti-2019-2025-ma_ALBSBADJYUA2.pdf
[9] TOMCZYK, Ł. Senioři ve světě nových médií a fenomén digitálního vyloučení v zemích Visegrádské čtyřky [Seniors in the Information Society and the Phenomenon of Digital Exclusion in the Visegrad Countries]. E-pedagogium: nezávislý odborný časopis pro interdisciplinární výzkum v pedagogice, s ohledem na pedagogiku, speciální pedagogiku a didaktiky oborů.2015(3), s. 83-95 [cit. 2019-05-13]. ISSN 1213-7758. Dostupné z: [Online]. http://old.pdf.upol.cz/fileadmin/user_upload/PdF/e-pedagogium/2015/e-Pedagogium_3-2015online.pdf
[10] TOMCZYK, Ł. 2015. Vzdělávání seniorů v oblasti nových médií. Praha: Asociace vzdělávání dospělých. ISBN 978-80-904531-9-7.
[11] WIECHETOVÁ, L. Češi se do počítačových kurzů nehrnou. In: Statistika a my. 07-08/2019. [Online]. [cit. 2019-11-18]. Dostupné z: http://www.statistikaamy.cz/2019/08/cesi-se-do-pocitacovych-kurzu-nehrnou/

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