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Computer-assisted language learning in the context of digital skills of older adults

Nauka języków obcych za pomocą komputera w kontekście kompetencji cyfrowych osób starszych

Abstract

The COVID-19 pandemic led to a situation where older adults, the group most at risk of contracting the virus and at the same time the most digitally excluded in society, had to either give up all activity or make a greater effort to engage in various activities online. This was the case of learning a foreign language, which is one of the most popular educational activities chosen by this age group. The article analyses the potential of remote language learning with the use of information and communication technologies (ICT) in the context of challenges that older adults face in the digital world. Through the analysis of ten criteria for technology adoption, the study shows that the main obstacles preventing older adults from learning a foreign language online can be eliminated if third parties (family, peers, web developers, course organizers) engage in promoting and facilitating online learning experience.

Keywords: digital skills, CALL, older adults, late adulthood, foreign language learning.

Streszczenie

Pandemia COVID-19 doprowadziła do sytuacji, w której osoby starsze, czyli grupa najbardziej narażona na zarażenie wirusem i jednocześnie najbardziej wykluczona cyfrowo, musiały albo zrezygnować z wszelkiej aktywności, albo podjąć większy wysiłek, aby zaangażować się w różne działania w sieci. Tak było w przypadku nauki języka obcego, która jest jedną z najpopularniejszych aktywności edukacyjnych wybieranych przez tę grupę wiekową. W artykule przeanalizowano potencjał zdalnej nauki języków obcych z wykorzystaniem technologii informacyjnych i komunikacyjnych w kontekście wyzwań, jakie stoją przed starszymi dorosłymi w cyfrowym świecie. Poprzez analizę dziesięciu kryteriów adopcji technologii badanie pokazuje, że główne przeszkody uniemożliwiające starszym dorosłym naukę języka obcego online mogą zostać wyeliminowane, jeśli osoby trzecie (rodzina, rówieśnicy, twórcy narzędzi internetowych, organizatorzy kursów) zaangażują się w promowanie i ułatwianie doświadczeń związanych z nauką online.

Słowa kluczowe: kompetencje cyfrowe, nauka języków za pomocą komputera, osoby starsze, późna dorosłość, nauka języków obcych.

Introduction

During the COVID-19 pandemic, access to many basic services or activities was limited to only a computer and the Internet. In such a situation, people with low digital competences had to acquire them very quickly, rely on the help of third parties or give up any activity whatsoever. In the case of learning, these people have been faced with a double challenge: on the one hand, they are unfamiliar with the learning environment, i.e. with new devices, particular websites or programmes, and on the other hand, they are learning something new, assimilating content that was previously unfamiliar, which in itself is a situation requiring a high degree of concentration and open-mindedness. Unlike learning knowledge-based subjects (e.g. history or psychology), learning to communicate in a foreign language is not based on building up the acquired knowledge, but rather broadening it and actively developing complex skills. The digital environment might seem not fully conducive to this type of learning, particularly when digital skills of the participants are not high. At the same time, it is sometimes the only way to learn, which was definitely the case in the first stages of the pandemic.

This paper aims at analysing the potential of computer-assisted language learning (CALL) in late adulthood in the context of digital skills of older adults. Through the analysis of digital competences in this age group as well as the benefits of language learning in old age, I intend to show that CALL could be a comprehensive solution to problems involving technology use, cognitive decline, and negative self-stereotypes. The analysis is based on Lee and Coughlin's criteria for technology adoption[1] and it will encompass both teacher-led online courses as well as self-directed learning with mobile applications. The paper is a contribution to a growing (yet still insufficient) body of literature on individuals in the "third age". The scientific – particularly empirical – reflection in this area is the first step in recognizing the needs of older adults, which can subsequently lead to implementing solutions improving their well-being and standard of living.

Digital skills

Terms such as "computer literacy", "digital literacy'", "21st century skills" and "digital skills" are sometimes used interchangeably to describe one's interaction with ICT (information and communication technologies), but in fact they refer to different phenomena. Computer literacy is the practical ability to use a computer

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[1] C. Lee, J.F. Coughlin, *PERSPECTIVE: Older Adults' Adoption of Technology: An Integrated Approach to Identifying Determinants and Barriers, "*Journal of Product Innovation Management" 2015, Vol. 32, No. 5, p. 750. DOI: 10.1111/jpim.12176.

and to navigate freely through computer software, while other terms refer to more complex, higher-order skills and interaction with content. Digital literacy is associated with finding and creating content (including communication) on digital platforms[2], whereas 21st century skills concern learning skills (i.e. critical thinking, collaboration, problem solving) and life skills (i.e. flexibility and adaptability, social and intercultural skills, productivity, responsibility, leadership) in addition to digital skills[3]. Finally, digital skills, the term which will be used throughout this paper, encompass "basic skills necessary to use the internet and skills required to comprehend and use online content"[4].

The acquisition of digital skills does not happen on its own, especially for people who are not "digital natives". This notion, along with its opposite, the "digital immigrant", was coined by Marc Prensky in a 2001 article, where he describes the differences between the generation that grew up surrounded by new technologies and the generations that had to learn them later. Digital natives are people who are used to quick and easy access to information, as well as to doing several things at once and receiving instant gratification. Such people prefer images to text[5]. The opposite of digital natives are digital immigrants, who have learned about the world of new technologies as young people or adults. Just like people who have learned a foreign language, digital immigrants can successfully learn to use technology, but it will always be an acquired and "unnatural" skill. According to Prensky, immigrants will be more likely to turn to print rather than digital text, they will look for information in sources other than the internet, and they will be attached to paper instructions and traditional messages. Prensky also claims that the two groups are so dissimilar that differences in their brain structure can be observed, yet other researchers argue that there is no scientific evidence to support this claim[6].

The concepts proposed by Prensky are based on the criterion of age, as the classification into the group of "immigrants" or "natives" depends on year of birth. However, as research by Ellen Helsper and Rebecca Eynon[7] indicates, age is not the only factor that predisposes a person to use new technologies more or less freely. Factors such as the extent of Internet use, experience, gender and education are equally important. The first of these is particularly salient – people who are immersed in the world of technology and use it in a variety of ways exhibit the

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[2] E. Van Lar, A. van Deursen, J. van Dijk, J. de Haan, *The relation between 21st-century skills and digital skills: A systematic literature review*, „Computers in human behavior" 2017, Vol. 72, p. 579.

[3] *Ibidem*, p. 578.

[4] E. van Laar, A.J. van Deursen, J. van Dijk, J. de Haan, *Determinants of 21st-century skills and 21st-century digital skills for workers: A systematic literature review*. "Sage Open*"* 2020, Vol. 10, No. 1.

[5] M. Prensky, *Digital natives, digital immigrants.* Part 1, „On the Horizon" 2001, Vol. 9, No. 5, p. 1.

[6] E.J. Helsper, R. Eynon, *Digital natives: where is the evidence?,* "British Educational Research Journal" 2010, Vol. 36, No. 3, pp. 503–520.

[7] *Ibidem*, pp. 503–520.

characteristics of "digital natives", regardless of their age. Prensky's division is therefore an oversimplification that singles out two non-overlapping groups, while the reality is much more complex. However, there is no denying that older people are a group at risk of being "digital immigrants" both by the criterion of age and by their inability to interact with technology.

Unfortunately, for many older adults, becoming even moderately ICT-proficient "digital immigrants" is out of reach, which puts them in the group of digitally excluded. Digital exclusion refers to people who do not have regular access to information technology and/or lack the skills to use it[8]. The widening gap between those who are digitally excluded and those who have access to technology creates a so-called digital divide, moderated by factors such as socioeconomic status, education, race, place of residence and gender.

As Magdalena Cyrklaff[9] notes, digital exclusion is not only about the digital divide and belonging to a group of people 'cut off' from new technologies. Such a situation has its consequences, both individual and social ones. Digital exclusion leads to social exclusion(e.g. inability to communicate with others, lack of access to information) and economic exclusion (e.g. lower attractiveness on the labour market, fewer opportunities for personal development, and less time and money saved). Hence the numerous programmes designed to include people with limited access to technology and digital skills, whose aim has primarily been to reduce the fear of using technology and to change the mentality of excluded groups, because it is the psychological barrier that turns out to be one of the biggest obstacles among the digitally excluded.

Digital competences of older adults

In the UK, in 2012, only 59% of people aged 65 and over reported using digital technologies[10]. Among Polish seniors, the percentage was even lower in a CBOS (Public Opinion Research Center) survey conducted seven years later – in 2019 it was 26%[11], which is the last place among European Union countries[12]. Older adults spend the least amount of time online per week of all age groups – it is just over 8

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[8] M. Cyrklaff, *Wykluczenie cyfrowe osób w wieku 50+. Sygnalizacja problemu* [in:] *Starzenie się ludności jako wyzwanie XXI wieku. Ujęcie interdyscyplinarne*, ed. W. Girańczyk, Toruń 2016, p. 200.

[9] M. Cyrklaff, *Wykluczenie cyfrowe…, op.cit.,* p. 207.

[10] L. Betts, R. Hill, S.E. Gardner, *There's not enough knowledge out there": Examining older adults' perceptions of digital technology use and digital inclusion classes,* "Journal of Applied Gerontology" 2019, Vol. 38, No. 8, p. 1148.

[11] M. Feliksiak, *Korzystanie z internetu*, https://www.cbos.pl/SPISKOM.POL/2019/K_095_19. PDF [access: 19.07.2022], p. 2.

[12] D. Batorski, D. Czerniawska, W. Fenrich, W. Kowalik, P. Kubicki, M. Olcoń-Kubicka, J. Zając, M. Żychlińska, *Między alienacją a adaptacją: Polacy w wieku 50+ wobec internetu,* http://www.zarz. agh.edu.pl/wkowalik/publikacje/dojrzalosc_w_sieci-raport.pdf [access: 19.07.2022], p. 5.

hours, while the average is 12.67 hours[13]. When it comes to activities undertaken online, the CBOS study shows that seniors primarily search for information (e.g. read articles on news portals). At the same time, older adults are less likely than other age groups to create their own content online, use social media, online banking, make new friends and shop online. The use of technology by older people is therefore significantly less comprehensive than the technological experience of younger generations. Research also indicates that older people both use fewer technology tools and perform fewer activities compared to younger users[14]. In contrast, those seniors who use technology willingly and a lot are those who are more interested in technology, have higher income, higher cognitive skills and are in better health[15]. Batorski[16] distinguished five attitudes of older people towards digital technologies. They include the following:

1. Active Internet users, open to new solutions and expanding their competences;
2. Internet users satisfying selected needs;
3. Internet users using the web not relying on others or through intermediaries;
4. Non-users of the Internet, who had the opportunity to start using it, but did not take advantage of it;
5. People without access to new technologies.

It seems that Polish retirees seldom belong to the first group. The barriers they face include lack of motivation to use ICT and fear stemming from harmful beliefs and prejudices about technology. Unfortunately, these prejudices are exacerbated and reproduced by other age groups, leading to a situation where seniors do not have people around them to encourage and motivate them to use technology[17]. Cyrklaff[18] divided the barriers to accessing technology among older people into three groups. The first relates to the aforementioned lack of knowledge and motivation to use the Internet. This is linked to psychological problems, fears about online safety, fear of falling into addiction. The lack of motivation is also due to the lack of online content and services which would be interesting and relevant for this age group. This set of barriers also includes self-exclusion, i.e. cutting oneself off from learning opportunities, as well as stereotypes and prejudices about technology and learning as an adult. The second group of barriers relates to lack of access to technology. In this case, this can be lack of financial resources or good equipment, and technical problems such as low internet speed reducing the convenience of

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[13] M. Feliksiak, *Korzystanie z internetu..., op.cit.,* p. 5.

[14] L. Betts, R. Hill, S.E. Gardner, *There's not enough…, op.cit.,* p. 1150.

[15] N. Wagner, K. Hassanein, M. Head, *Computer use by older adults: A multi-disciplinary review,* "Computers in Human Behavior" 2010, Vol. 26, No. 5, p. 878. DOI: 10.1016/j.chb.2010.03.029.

[16] D. Batorski, D. Czerniawska, W. Fenrich, W. Kowalik, P. Kubicki, M. Olcoń-Kubicka, J. Zając, M. Żychlińska, *Między alienacją a adaptacją..., op.cit.,* p.6.

[17] *Ibidem*, p. 32.

[18] M. Cyrklaff, *Wykluczenie cyfrowe…, op.cit.,* p. 205.

use. Finally, the third group of barriers are those related to the lack of skills to use the Internet effectively, especially low knowledge of the possibilities of using the ICT and the problem with acquiring this knowledge.

The report by Weronika Chodacz, who conducted a survey among 117 seniors already using the Internet and possessing at least basic digital competences[19] is particularly interesting in this context. The results confirm low creativity of seniors online and the use of the Internet mainly to obtain information. Only 22 % of those surveyed declared that they stay online all the time, with the rest going online only for a specific purpose. In addition, the report identifies the main problems faced by older web users. Respondents rated their digital competences as low and were afraid of the dangers of using the Internet (data theft, loss of work results, false information). They also noticed the problem of online hate, but felt helpless and did not know how to act (e.g. by reporting posts to the site administrator).

Wagner and colleagues argue that older people are the fastest expanding group of computer and internet users[20]. However, Polish research indicates that the growth of internet users in this age group is slower than in other groups and happens because younger generations who have acquired digital competences while still in the workforce reach retirement age. In addition, older people are more likely than younger Internet users to stop using computers and the Internet precisely because they have stopped working[21].

Impact of the COVID-19 pandemic on the digital competences of older people

The COVID-19 pandemic has certainly changed the picture of technology use in our society. Unfortunately, we do not yet have much data to give a complete picture of the current situation. In the context of digital exclusion during the pandemic, a report by the Consumers' Federation (2021)[22] takes a closer look at the issue in the context of three different groups: pupils/students, residents of rural and small towns and older adults. The authors of the report consider seniors as the group most affected by the restrictions on social and economic life introduced by the pandemic. Digitally excluded people in particular have become ''invisible'', as they have lost the ability

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[19] W. Chodacz, *Potrzeby i kompetencje medialne osób 55+. Raport Towarzystwa Inicjatyw Twórczych „ę*", https://e.org.pl/wp-content/uploads/2020/03/Raport-Potrzeby-i-kompetencje-medialne-os%C3%B3b-55-plus-.pdf [access: 19.07.2022].

[20] N. Wagner, K. Hassanein, M. Head, *Computer use by older adults..., op.cit.,* p. 870.

[21] D. Batorski, D. Czerniawska, W. Fenrich, W. Kowalik, P. Kubicki, M. Olcoń-Kubicka, J. Zając, M. Żychlińska, *Między alienacją…, op.cit.,* p. 5.

[22] M. Herde, E. Szadzińska, *Wykluczenie cyfrowe podczas pandemii,* http://www.federacja-konsumentow.org.pl/n,6,1479,1,1,wykluczenie-cyfrowe-podczas-pandemii.html [access: 22.072022].

to function in social life. Such people were cut off almost overnight from being able to perform the basic activities of daily life. In a pandemic reality, digitally excluded senior citizens were not able to send an e-mail to the office, attend a meeting of the University of the Third Age (U3A) online, pay their bills online rather than at the post office, and so on. It is worth mentioning at this point that those who nevertheless decided to leave their house (especially before the introduction of the vaccine) to do their errands in a traditional way were putting their health and lives at risk. In such a context, having digital skills seems to be life-saving.

The aforementioned report indicates that a big support in this situation was the help of the family, while some people had to convince themselves to use a computer on their own. The report cites research from 2019, in which 24.9% of respondents admitted that third parties ran errands for them online. In the COVID-19 era, we can only expect this trend to increase. On the other hand, the mental barrier of beliefs such as: "I don't need the Internet for anything" or "it's a tool for young people", has lost its importance. Older adults have realised that they also need digital skills. The change in thinking can be seen, for example, in the context of finance: since the start of the pandemic, half of working adults over the age of 60 switched from paying with cash to digital payments[23]. What is more, half of the seniors surveyed by the Office of Electronic Communications (UKE) say they use instant messaging and video meeting applications more frequently. On the other hand, they have fewer options to participate in virtual activities of U3As and senior centres. These institutions started to come forward with many proposals for online meetings for seniors after the outbreak of the pandemic, but due to lack of interest, these started to gradually die out. Only some of the initiatives took hold, gathered a permanent audience and survived for more than a year. UKE sees the reason for this phenomenon in the fact that a meeting held online does not fully satisfy the social needs of older people.

The above information indicates that we are facing a situation where, on the one hand, the pandemic is a positive stimulus for increasing digital skills of seniors, and on the other, it is a situation that may cause further problems and make seniors even more vulnerable to digital and social exclusion.

Digital skills and remote language learning

Computer-assisted language learning (CALL) has been widely adopted in foreign language teaching long before the pandemic – for nearly 30 years[24]. The range of

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[23] *Jak pandemia zmieniła nawyki zakupowe Polaków*, https://edenred.pl/baza-wiedzy/raporty [access: 19.07.2022].

[24] E.M. Golonka, A.R. Bowles, V.M. Frank, D.L. Richardson, S. Freynik, *Technologies for foreign language learning: A review of technology types and their effectiveness*. "Computer assisted language learning" 2014, Vol. 27, No. 1, p. 71.

tools available include course-management systems, such as Moodle, Blackboard or Google Classroom, and individual learning tools, such as videos, digital flashcards and mobile applications. Their attractiveness, in comparison with traditional learning tools, stems from their flexibility, engaging tasks and diversity of authentic materials. However, the scientific evidence for the efficacy of ICT-based learning is limited. One of few studies on this topic has shown that students using CALL achieve better results than those taking traditional courses[25]. In contrast, students taking the hybrid formula had better results than online students. The authors of this study point out that the determining factor for the greater success of the remote formula is not the fact of computer-based learning *per se*, but the fact that this form of the course usually involves more time for individual work on the material. Other researchers have found that remote learning promotes greater progress in writing and reading skills[26], while it is not known whether progress is made in speaking and listening comprehension skills. Interestingly, tools based on automatic speech recognition (e.g. many popular mobile applications for language learning) have been shown to have a greater effect on pronunciation improvement than human teachers[27].

Mobile applications for language learning constitute a sub-field of CALL tools which have noted an unprecedented growth in popularity during the pandemic[28]. For instance, the number of users in a popular Duolingo app doubled in March 2020[29]. While decision to learn made at that time might have been dictated by boredom, data from another application, Babbel, show that its users have different motivations depending on their age: younger generations learn mostly for self-improvement and travelling, while older users learn primarily for mental fitness[30]. Regardless of the reason for learning, mobile apps are a very attractive way to enhance one's foreign language skills, as there are no constraints of time and place and the learning materials are engaging, entertaining and often gamified. Research shows that learning with apps is helpful particularly in developing pronunciation, reading, listening, vocabulary and speaking skills[31], but it also has a positive effect on motivation,

[25] R.J. Blake, *Current trends in online language learning*. "Annual Review of Applied Linguistics*"* 2011, Vol. 31, pp. 19–35.

[26] S.S. Jabeen, A.J. Thomas, *Effectiveness of online language learning,* "Proceedings of the World Congress on Engineering and Computer Science" 2015, Vol. 1, pp. 1–5.

[27] E.M. Golonka, A.R. Bowles, V.M. Frank, D.L. Richardson, S. Freynik, *Technologies for foreign language learning…, op.cit.,* p. 88.

[28] L. Ceci, *Language learning apps – statistics & facts*, https://www.statista.com/topics/8425/language-learning-apps/#dossierKeyfigures [access: 24.07.2022].

[29] https://blog.duolingo.com/changes-in-duolingo-usage-during-the-covid-19-pandemic/ [access: 24.07.2022].

[30] https://assets.ctfassets.net/zuzqvf4m2o58/MFQUFtY90ELfmO7bYHGjq/cacf15bc88b16af5d-df680d115170c9d/Babbel_Global_User_Survey_2016.pdf [access: 24.07.2022].

[31] J. Burston, *Twenty years of MALL project implementation: A meta-analysis of learning outcomes.* "ReCALL" 2015, Vol. 27, No. 1, p. 4–20. DOI: 10.1017/S0958344014000159.

confidence and further use of mobile devices for educational purposes[32]. On the other hand, there are studies which report problems with learner persistence and language learning outcomes which are only moderately positive[33]. Nevertheless, mobile applications for language learning continue growing in popularity, also among the older demographic. In Germany 36% of learners in a popular Duolingo app are 40 or older[34], in Argentina, 20% of users are 50 or over[35].

Learning a foreign language in an online environment has been shown to have benefits beyond the aforementioned linguistic skills. Other benefits of CALL include greater motivation of students to collaborate and engage in meaningful interactions. Courses designed with online course management systems were found to enhance students' autonomy and confidence[36]. During the COVID-19 pandemic, the interactive dimension of CALL may have been further reinforced as students, deprived of other opportunities to interact with their peers, appreciated every opportunity to interact and talk. At the same time, the remote format is conducive to lower anxiety of learners who can do the tasks at their own pace and they do not feel under pressure to perform in a certain way[37].

On the other hand, there are also caveats of online language learning, such as studying regularly, staying motivated and directing one's learning[38]. These issues require development of the sense of independence and responsibility for one's learning process, which is what students are often unaccustomed to. In the case of older learners, shaped by a traditional model of education in their own school days, exercising autonomy in the learning process could be even more challenging than for younger students.

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[32] J. Kacetl, B. Klímová, *Use of smartphone applications in English language learning – A challenge for foreign language education*. "Education Sciences*"* 2019, Vol. 9, No. 3, p. 184.

[33] G. Lord, *I don't know how to use words in Spanish": Rosetta Stone and learner proficiency outcomes.* "The Modern Language Journal" 2015, Vol. 99, No. 2, pp. 401–405. DOI: 10.1111/modl.12234_3; K.B. Nielson, *Self-study with language learning software in the workplace: What happens?* "Language Learning & Technology" 2011, Vol. 15, No. 3, p. 110–129; S. Loewen, D. Crowther, D.R. Isbell, K.M. Kim, J. Maloney, Z.F. Miller, H. Rawal, *Mobile-assisted language learning: A Duolingo case study. "*ReCALL" 2019, Vol. 31, No. 3, pp. 293–311. DOI: 10.1017/s0958344019000065.

[34] https://blog.duolingo.com/dear-duolingo-how-does-language-learning-differ-between-generations/ [access: 24.07.2022].

[35] https://blog.duolingo.com/latin-america-language-learning-trends/ [access: 24.07.2022].

[36] N. Sanprasert. *The application of a course management system to enhance autonomy in learning English as a foreign language,* „System" 2009, Vol. 38, No. 1, pp. 109–123; L. Lee. *Autonomous learning through task-based instruction in fully online language courses,* "Language Learning & Technology" 2016, Vol 20, No. 2, pp. 81–97.

[37] S. Li, P. Hiver, M. Papi, *Individual Differences in Second Language Acquisition: Theory, Research, and Practice* [In:] *The Routledge Handbook of Second Language Acquisition and Individual Differences,* ed. S. Li, P. Hiver, M. Papi, London 2022, p. 26.

[38] S.Y. Sun, *Learner perspectives on fully online language learning,* "Distance education" 2014, Vol. 35*,* No. 1, p. 34.

Language learning in late adulthood

There is no scientific evidence that learning a foreign language at an older age is not possible. Of course, the process may be hindered due to changes in the ageing brain (e.g. reduced working memory resources, increased reaction time, slower processing speed, difficulties in reproducing new information, problems with concentration[39]). However, among healthy seniors, there is no neurobiological evidence of a deterioration in the brain's ability to process information[40]. According to the current state of scientific knowledge, older adults are capable of learning[41] – the process is "effortful"[42] and "difficult, but not impossible"[43].

Older people, similarly to younger learners, find it easier to 'refresh' a language they have previously learnt than to start a new language from scratch. In fact, being bi- or multilingual, i.e. having the ability to use two or more languages, results in many cognitive benefits in older age, such as improved neuroplasticity[44] and larger grey matter volume[45] than in monolinguals. There is also research suggesting that bilingualism can delay the diagnosis of dementia or Alzheimer's disease by 4.3 years[46]. However, even starting to learn a foreign language at an older age has a positive effect on certain brain functions. Research shows that language learning seems to be more conducive to improvement of cognitive fitness than other activities, such as a course in music appreciation[47]. An important aspect of cognitive

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[39] S.E. Pfenninger, Z. Polz, *Foreign language learning in the third age: A pilot feasibility study on cognitive, socio-affective and linguistic drivers and benefits in relation to previous bilingualism of the learner, "*Journal of the European Second Language Association" 2018, Vol. 2*, No. 1, pp. 1–13.

[40] M. Ramscar, P. Hendrix, C. Shaoul, P. Milin, H. Baayen, *The myth of cognitive decline: Non-linear dynamics of lifelong learning*, "Topics in Cognitive Science" 2014, Vol. 6, pp. 5–42.

[41] J.G. Cox, *Explicit instruction, bilingualism, and the older adult learner*, "Studies in Second Language Acquisition*"* 2015, Vol. 39, No. 1, pp. 1–30.

[42] M. Kliesh, N. Giroud, S.E. Pfenninger, M. Meyer, *Research on second language acquisition in old adulthood: What we have and what we need* [In:] *Third age learners of foreign languages,* ed. D. Gabrys-Barker, Bristol 2018.

[43] A.E. Lenet, C. Sanz, B. Lado, J.H. Howard, D.V. Howard, R.P. Leow, *Aging, pedagogical conditions, and differential success in SLA: An empirical study* [In:] *Implicit and explicit conditions, processes and knowledge in SLA and bilingualism,* ed. C. Sanz, R.P. Leow, Washington 2011.

[44] P. Li, J. Legault, K.A. Litcofsky, *Neuroplasticity as a function of second language learning: anatomical changes in the human brain, "*Cortex*"* 2014, Vol. 58, pp. 301–324.

[45] J. Abutalebi, M. Canini, P.A. Della Rosa, L.P. Sheung, D.W. Green, B.S. Weekes, *Bilingualism protects anterior temporal lobe integrity in aging, "*Neurobiology of Aging*"* 2014, Vol. 35, No. 9, pp. 2126–2133.

[46] F.I. Craik, E. Bialystok, M. Freedman, *Delaying the onset of Alzheimer disease: Bilingualism as a form of cognitive reserve, "*Neurology*"* 2010, Vol. 75, No. 19, pp. 1726–1729.

[47] P.C. Wong, J. Ou, C.W. Pang, L. Zhang, C.S. Tse, L.C. Lam, M. Antoniou, *Language training leads to global cognitive improvement in older adults: A preliminary study, "*Journal of Speech, Language, and Hearing Research" 2019, Vol. 62, No. 7, pp. 2411–2424.

functioning – working memory (a subsystem for storing and processing information in real time) was found to be linked to language attainment in older adults[48]. Two other attentional skills: inhibition (the ability to suppress irrelevant stimuli) and switching (shifting attention between one task and the other), were found to benefit from language learning, but in order to observe improvement, there must be at least 5 hours of language learning per week[49].

A very important, if not the most important, dimension of foreign language learning among seniors is the socio-psychological dimension. The learning experience can have an impact on increasing the self-confidence, proficiency, independence of seniors and can also counteract their exclusion and isolation[50]. On the other hand, senior learners have to face harmful self-stereotypes about not being able to learn a language as an adult, resulting in high stress levels, low motivation, fear of being judged and failing. High anxiety during a language lesson, combined with problems resulting from cognitive decline, might lead to insurmountable barriers in the mind of the learner. It is therefore important to support seniors especially at the beginning of their language journey so that they do not give up too soon after they have decided to learn a foreign language. It is crucial to reinforce their positive beliefs about themselves and language learning, and to weaken the harmful ones.

It is therefore clear that learning a foreign language in old age is beneficial for many aspects of cognitive and social functioning. Indeed, the popularity of language courses in U3As suggests that older adults are aware of these benefits – in 2014, 83.3% of Polish U3As were offering English courses[51]. However, the motivation of their participants was not that evident when the pandemic forced seniors learning a foreign language to consider the transition to remote learning, confronting them with several dilemmas: Do I want to learn a language online? Will I still enjoy learning? Are my computer skills sufficient for this? If not, do I want to take advantage of this opportunity to learn? Unfortunately, some seniors probably answered these questions negatively, denying themselves the opportunity to learn, interact with others and develop digital skills. At the same time, older adults who had not been learning a foreign language, were faced with a greater challenge of taking up an entirely new activity in an entirely new form.

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[48] A. Mackey, R. Sachs, *Older learners in SLA research: A first look at working memory, feedback, and L2 development,* "*Language Learning*" 2012, Vol. 62, No. 3, pp. 704–740.

[49] T.H. Bak, M.R. Long, M. Vega-Mendoza, A. Sorace, *Novelty, challenge, and practice: The impact of intensive language learning on attentional functions,* "PloS one" 2016, Vol. 11, No. 4.

[50] M. Antoniou, G.M. Gunasekera, P.C.M. Wong, *Foreign language training as cognitive therapy for age-related cognitive decline: A hypothesis for future research,* "Neuroscience and Biobehavioral Reviews" 2013, Vol. 37, No. 10, pp. 2689–2698.

[51] http://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5488/10/1/1/uniwersytety_trzeciego_wieku.pdf [access 24.07.2022].

Potential of online language learning in older age

If face-to-face language courses are so popular, what made some older adults give up on learning when distance education became the only mode of learning? Also, what factors might have guided new learners to take up learning? I will try to answer these questions through the analysis of CALL in the context of ten factors facilitating or determining older people's use of technology, distinguished by Chaiwoo Lee and Joseph Coughlin. The authors focus on the design of technology-based devices, but their model can also be adapted to the use of online learning tools. The factors are the following: value, usability, affordability, accessibility, technical support, social support, emotion, independence, experience and confidence[52].

Value – perception of usefulness and potential benefit

As indicated above, older adults take up learning mostly to improve mental fitness. They are thus aware of the benefits of language learning. However, they might not fully realize the potential of online learning, which they might associate mostly with games and entertainment. Therefore, the knowledge about real outcomes and usefulness of CALL tools should reach this demographic more effectively.

Usability – perception of user friendliness and ease of learning

Different online learning tools have different levels of complexity. In the case of mobile apps, the installation process and user registration might be discouraging, but later the user is guided on a linear learning path (e.g. in Duolingo), while computer software can be much more complex and less intuitive.

Affordability – perception of potential cost savings

CALL offers many free-of-charge options, for instance educational videos on platforms such as YouTube, websites with grammatical exercises, and free versions of mobile applications, which give online learning a significant advantage over the "traditional" mode. There are also teacher-led online courses of English as a foreign language which are free of charge, such as "Komunikatywny senior" (Communicative senior) course organised by the University of Warsaw[53]. In this context, the only required expenses are related to buying equipment (smartphone, laptop) and paying for the internet access.

Accessibility – knowledge of existence and availability in the market

The issue of accessibility might be one of the main obstacles of older adults, especially those whose digital skills are low. Family and friends can contribute in this respect, familiarizing the older person with all the possibilities for learning online.

Technical support – availability and quality of professional assistance throughout use

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[52] C. Lee, J.F. Coughlin, *PERSPECTIVE: Older Adults' Adoption…, op.cit.,* p. 750.
[53] https://www.wne.uw.edu.pl/misja-neo/formularz-1 [access 24.07.2022].

Potential users need support and guidance when choosing which tool to use and subsequently throughout the learning experience. When the course is organised locally, it might be easy to ask for help from e.g. the course instructor, but if someone chooses to learn by self-selecting learning content available online, they might be discouraged by lack of support in case of problems. However, data show that older adults are more likely to follow a self-directed learning path rather than enrol on a specific course: in 2020, among adults aged 65 and older in the UK, 2% were participating in online courses and 5% were using online learning materials[54].

Social support – support from family, peers, and community

This is an extremely important issue particularly in the face of harmful self-stereotypes which many older adults struggle with. Their families and friends should strengthen positive attitudes to learning at an old age, both when it comes to digital skills and languages. Friends play an important role here, as in this age group, learning from one's peers has been identified as a very effective method[55]. Other researcher suggest having a "technology champion" who would introduce an older person to ICT[56].

Emotion – perception of emotional and psychological benefits

The affective aspect might act both in favour and against CALL. As described above, learning in an online setting at one's own pace might result in a lower language anxiety. However, this positive effect might be counteracted by anxiety related to the use of unknown technology.

Independence – perception of social visibility or how a technology makes them look to others

According to Lee and Coughlin, "*Older adults are more likely to adopt and continue to use technology that helps them remain independent, lets them have control and authority over its features and functions*[57]". It seems that well-designed learning software would meet these requirements, but acquiring full comfort of its use is a prerequisite for success.

Experience – relevance with their prior experiences and interactions

This dimension gives advantage to older adults with prior experience with ICT, which in 2019 in Poland amounted to 26% of this demographic[58]. However, if someone's experience was negative, this person will be less likely to engage with technology again, even if it is an entirely different product[59].

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[54] Share of individuals using online learning materials and doing online courses in Great Britain in 2020, by age and gender. https://www.statista.com/statistics/882117/online-learning-in-the-uk-by--demographic/ [access: 24.07.2022].

[55] L.R. Betts, S.E. Gardner, *There's not enough knowledge…, op.cit.,* pp. 1147–1166.

[56] C. Lee, J.F. Coughlin, *PERSPECTIVE: Older Adults' Adoption…, op.cit.,* p. 752.

[57] *Ibidem,* p. 753.

[58] M. Feliksiak, *Korzystanie z internetu,* https://www.cbos.pl/SPISKOM.POL/2019/K_095_19.PDF [access: 19.07.2022], p. 2.

[59] C. Lee, J.F. Coughlin, *PERSPECTIVE: Older Adults' Adoption…, op.cit.,* p. 754.

Confidence – empowerment without anxiety of intimidation

Older adults must feel confident about their use of ICT, otherwise they might become less satisfied and as a consequence less likely to use it again. To enhance their self-efficacy, older adults should be provided with support, training and intuitive learning tools.

This analysis shows that using CALL in late adulthood has its undeniable strengths, such as low cost and high cognitive and social benefits. On the other hand, problems such as the need of training and social support as well as lack of awareness of the existence of the tools, are easily solvable if other people are engaged in facilitating the experience for older adults.

Conclusion

Learning a foreign language is a difficult and complex process. If it takes place in a remote setting and with less teacher input, it is even more difficult. And when the learner is a person in their 60s, 70s or 80s, with lower digital competences and the habits from their own schooling, the situation becomes even more complicated. The aim of this article was to show that despite these seemingly unfavourable circumstances, using CALL tools has a great potential in making older adults more engaged with ICT, at the same time enhancing their mental fitness and well-being through language learning. In order to make this process successful, the involvement of third parties is necessary. Families and peers should encourage older people to use ICT for learning, telling them about available tools and showing how to use them. The task of developers of CALL tools is to prevent negative reactions by anticipating possible problems and making the software as easy and intuitive as possible. Course organizers should offer technical support before and during the course. Society in general and the world of academia in particular should promote learning with ICT in old age, underlining the scientifically proven benefits of this endeavour.

Bibliography

Abutalebi J., Canini M., Della Rosa P.A., Sheung L.P., Green D.W., Weekes B.S., *Bilingualism protects anterior temporal lobe integrity in aging,* "Neurobiology of Aging" 2014, Vol. 35, No. 9.

Antoniou M., Gunasekera G.M., Wong P.C.M., *Foreign language training as cognitive therapy for age-related cognitive decline: A hypothesis for future research*, "Neuroscience and Biobehavioral Reviews" 2013, Vol. 37, No. 10.

Bak T.H. Long M.R., Vega-Mendoza M., Sorace A., *Novelty, challenge, and practice: The impact of intensive language learning on attentional functions*, "PloS one" 2016, Vol. 11, No. 4.

Betts L., Hill R., Gardner S.E., *"There's not enough knowledge out there": Examining older adults' perceptions of digital technology use and digital inclusion classes,* "Journal of Applied Gerontology" 2019, Vol. 38, No. 8.

Blake R.J., *Current trends in online language learning*, "Annual Review of Applied Linguistics" 2011, Vol. 31.

Cox J.G., *Explicit instruction, bilingualism, and the older adult learner.* "Studies in Second Language Acquisition" 2015, Vol 39, No. 1.

Craik F.I., Bialystok E., Freedman M., *Delaying the onset of Alzheimer disease: Bilingualism as a form of cognitive reserve,* "Neurology" 2010, Vol. 75, No. 19.

Cyrklaff M., *Wykluczenie cyfrowe osób w wieku 50+. Sygnalizacja problemu* [In:] *Starzenie się ludności jako wyzwanie XXI wieku. Ujęcie interdyscyplinarne*, Ed. W. Girańczyk, Toruń 2016.

Golonka E.M., Bowles A.R., Frank V.M., Richardson D.L., Freynik S., *Technologies for foreign language learning: A review of technology types and their effectiveness,* "Computer assisted language learning" 2014, Vol. 27, No. 1.

Helsper E.J., Eynon R., *Digital natives: where is the evidence?,* "British Educational Research Journal" 2010, Vol. 36, No. 3.

Jabeen S.S., Thomas A.J., *Effectiveness of online language learning,* "Proceedings of the World Congress on Engineering and Computer Science" 2015, Vol 1.

Kacetl J., Klímová B., *Use of smartphone applications in English language learning – A challenge for foreign language education*, "Education Sciences" 2019, Vol. 9, No. 3.

Kliesh M., Giroud N., Pfenninger S.E., Meyer M., *Research on second language acquisition in old adulthood: What we have and what we need* [In:] *Third age learners of foreign languages,* Ed. D. Gabrys-Barker, Bristol 2018.

van Laar E., van Deursen A., van Dijk J., de Haan J., The *relation between 21st-century skills and digital skills: A systematic literature review*, „Computers in human behavior" 2017, Vol. 72.

van Laar E., van Deursen A.J., van Dijk J.A., de Haan J., *Determinants of 21st-century skills and 21st-century digital skills for workers: A systematic literature review*, "Sage Open" 2020, Vol. 10, No. 1.

Lee C., Coughlin J.F., *PERSPECTIVE: Older Adults' Adoption of Technology: An Integrated Approach to Identifying Determinants and Barriers,* "Journal of Product Innovation Management" 2015, Vol 32, No. 5. DOI: 10.1111/jpim.12176.

Lee L., *Autonomous learning through task-based instruction in fully online language courses.* "Language Learning & Technology" 2016, Vol. 20, No. 2.

Lenet A.E., Sanz C., Lado B., Howard J.H., Howard D.V., Leow R.P., *Aging, pedagogical conditions, and differential success in SLA: An empirical study* [In:] *Implicit and explicit conditions, processes and knowledge in SLA and bilingualism*, eds. C. Sanz, R.P. Leow, Washington 2011.

Li P., Legault J., Litcofsky K.A., *Neuroplasticity as a function of second language learning: anatomical changes in the human brain,* "Cortex" 2014, Vol. 58.

Li S., Hiver P., Papi M., *Individual Differences in Second Language Acquisition: Theory, Research, and Practice* [In:] *The Routledge Handbook of Second Language Acquisition and Individual Differences,* eds. S. Li, P. Hiver, M. Papi, London 2022.

Loewen S. Crowther D., Isbell D.R., Kim K.M., Maloney J., Miller Z.F., Rawal H., *Mobile-assisted language learning: A Duolingo case study,* "ReCALL" 2019, Vol. 31, No. 3. DOI: 10.1017/s0958344019000065.

Lord G., *"I don't know how to use words in Spanish": Rosetta Stone and learner proficiency outcomes,* "The Modern Language Journal" 2015, Vol. 99, No. 2. DOI: 10.1111/modl.12234_3.

Mackey A., Sachs R., *Older learners in SLA research: A first look at working memory, feedback and L2 development*, "*Language Learning*" 2012, Vol. 62, No. 3.

Nielson K.B., *Self-study with language learning software in the workplace: What happens?* "Language Learning & Technology" 2011, Vol. 15, No. 3.

Pfenninger S.E., Polz S., *Foreign language learning in the third age: A pilot feasibility study on cognitive, socio-affective and linguistic drivers and benefits in relation to previous bilingualism of the learner,* "Journal of the European Second Language Association" 2018, Vol. 2, No. 1.

Prensky M., *Digital natives, digital immigrants. Part 1*, „On the Horizon" 2001, Vol. 9, No. 5.

Sanprasert N., *The application of a course management system to enhance autonomy in learning English as a foreign language*, „System" 2009, Vol. 38, No. 1.

Ramscar M., Hendrix P., Shaoul C., Milin P., Baayen H., *The myth of cognitive decline: Non-linear dynamics of lifelong learning*, "Topics in Cognitive Science" 2014, Vol. 6.

Sun S.Y., *Learner perspectives on fully online language learning,* "Distance education" 2014, Vol. 35, No. 1.

Wagner N. Hassanein K., Head M., *Computer use by older adults: A multi-disciplinary review,* "Computers in Human Behavior" 2010, Vol. 26, No. 5. DOI: 10.1016/j.chb.2010.03.029.

Wong P.C., Ou J., Pang C.W., Zhang L., Tse C.S., Lam L.C., Antoniou M., *Language training leads to global cognitive improvement in older adults: A preliminary study*, "Journal of Speech, Language, and Hearing Research" 2019, Vol. 62, No. 7.

Internet sources

Batorski D., Czerniawska D., Fenrich W., Kowalik W., Kubicki P., Olcoń-Kubicka M., Zając J., Żychlińska M., *Między alienacją a adaptacją: Polacy w wieku 50+ wobec Internetu,* http://www.zarz.agh.edu.pl/wkowalik/publikacje/dojrzalosc_w_sieci-raport.pdf

Chodacz W., *Potrzeby i kompetencje medialne osób 55+. Raport Towarzystwa Inicjatyw Twórczych „ę"*, https://e.org.pl/wp-content/uploads/2020/03/Raport-Potrzeby-i-kompetencje-medialne-os%C3%B3b-55-plus-.pdf

Ceci L., Language learning apps – statistics & facts, https://www.statista.com/topics/8425/language-learning-apps/#dossierKeyfigures

Feliksiak M., *Korzystanie z Internetu*, https://www.cbos.pl/SPISKOM.POL/2019/K_095_19.PDF

Herde M., Szadzińska E., *Wykluczenie cyfrowe podczas pandemii,* http://www.federacja-konsumentow.org.pl/n,6,1479,1,1,wykluczenie-cyfrowe-podczas-pandemii.html

Jak pandemia zmieniła nawyki zakupowe Polaków, https://edenred.pl/baza-wiedzy/raporty

Share of individuals using online learning materials and doing online courses in Great Britain in 2020, by age and gender, https://www.statista.com/statistics/882117/online-learning-in-the-uk-by-demographic/

Changes in Duolingo usage during the Covid-19 pandemic, https://blog.duolingo.com/changes-in-duolingo-usage-during-the-covid-19-pandemic/

Dear Duolingo: how does language learning differ between generations?, https://blog.duolingo.com/dear-duolingo-how-does-language-learning-differ-between-generations/

Special report: language-learning trends in Latin America, https://blog.duolingo.com/latin-america-language-learning-trends/

https://assets.ctfassets.net/zuzqvf4m2o58/MFQUFtY90ELfmO7bYHGjq/cacf15bc88b16af5d-df680d115170c9d/Babbel_Global_User_Survey_2016.pdf

https://www.wne.uw.edu.pl/misja-neo/formularz-1