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Barriers to Digital Inclusion among Older People: a Intergenerational Reflection on the Need to Develop Digital Competences for the Group with the Highest Level of Digital Exclusion

Barreras a la inclusión digital de las personas mayores: una reflexión intergeneracional sobre la necesidad de desarrollar competencias digitales para el colectivo con mayor nivel de exclusión digital

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ABSTRACT

Over the past thirty years and with the rise of the digital society, the process of digital exclusion has become increasingly noticeable and represents a sub-type of social exclusion. Shaping digital competences in the era of the intensive development of the information society requires constant reflection on the effectiveness of such activities. This article looks at what kind of barriers are currently blocking the development of digital competences among older people. Using structured interviews, responses were obtained from 30 respondents in Poland, though the respondents themselves did not belong to the demographic of older people. The respondents identified eight main types of barriers to digital inclusion for older people: 1) Fear of new technologies, 2) No need to use ICT, 3) Self-marginalisation in the information society, 4) The characteristics of new media, 5) Attitude to Life-Long Learning, 6) Physical limitations, 7) Economic determinants, and 8) Infrastructural limitations. The results of the qualitative research provide a fresh look at the process of the formation of digital competence among vulnerable groups within the wider process of digital inclusion. This article is the result of an international project REMEDIS supported in Poland by the National Science Centre - NCN [021/03/Y/HS6/00275].

KEYWORDS Digital skills; digital competences; digital inclusion; digital divide; older people; Poland.

RESUMEN

En los últimos treinta años y con el auge de la sociedad digital, el proceso de exclusión digital se ha vuelto cada vez más notorio y representa un subtipo de exclusión social. Dar forma a las competencias digitales en la era del desarrollo intensivo de la sociedad de la información requiere una reflexión constante sobre la eficacia de tales actividades. Este artículo analiza qué tipo de barreras están bloqueando actualmente el desarrollo de competencias digitales entre las personas mayores. Mediante entrevistas estructuradas, se obtuvieron respuestas de 30 encuestados en Polonia, aunque los propios encuestados no pertenecían al grupo demográfico de personas mayores, sino desde la visión de los más jóvenes. Los encuestados identificaron ocho tipos principales de barreras para la inclusión digital de las personas mayores: 1) Miedo a las nuevas tecnologías, 2) No necesidad de utilizar las TIC, 3) Automarginación en la sociedad de la información, 4) Las características de los nuevos medios, 5) Actitud hacia el aprendizaje permanente, 6) Limitaciones físicas, 7) Determinantes económicos y 8) Limitaciones de infraestructura. Los resultados de la investigación cualitativa brindan una nueva mirada al proceso de formación de la competencia digital entre los grupos vulnerables dentro del proceso más amplio de inclusión digital. Este artículo es el resultado de un proyecto internacional REMEDIS apoyado en Polonia por el Centro Nacional de Ciencias - NCN [021/03/Y/HS6/00275].

PALABRAS CLAVE Habilidades digitales; competencias digitales; inclusión digital; brecha digital; personas mayores; Polonia.

1. INTRODUCTION

Digital exclusion is a form of social exclusion (Jaeger et al., 2012; Parsons, & Hick, 2008; Tomczyk, 2015). For almost three decades, this problem has been one of the most significant challenges for social policy as well as for non-formal education due to the intensely developing information society (Norris, & Inglehart, 2013). Digital exclusion is mainly related to either having a low level of digital competence or lack the competence entirely (Blažič, & Blažič, 2020; Shakina et al., 2021). Information and communication technology (ICT) proficiency, access to new media and the Internet, the ability to use popular e-services, motivation related to the use of ICT, and critical-constructive analysis and attitudes towards ICT are critical factors for effective function in the information society (Wątróbski et al., 2018; Ziemba, 2019).

The possession of digital and media competence has now become as obvious and natural as the use of traditional media in the so-called analogue days – the ability to swipe to turn the page of an e-book might now be taken for granted in the same way that turning a physical page is (Plebanska, 2021; Stosic, 2015). The world is now highly saturated with professional and leisure activities that have entirely ICT-based solutions - letters are rare compared to emails, and fewer people share printed photos than share via social media – but despite this enormous shift to the online realm, there remain groups that are characterized by their low levels of digital and media competence (Cheshmehzangi et al., 2022; Esteban-Navarro et al., 2020). This community includes, in particular, older people (Tomczyk et al., 2019). Given the scale of the phenomenon of digital exclusion and the still unsatisfactory level of digital competences among older people, there is a need to ask the question of why, despite the many activities related to digital inclusion, are senior citizens still characterised by a high level of exclusion? To understand this, we might first consider the barriers that stand between the senior citizen and the development of the competences needed to function in the digital world. This article reflects on these points, and fills a gap in research that considers how this group's digital competences can be developed.

Theoretical framework

With the average life span increasing in many parts of the world, the topic of ageing has itself become central (Ramia, & Voicu, 2022). Many factors (for example, the decline in mortality couple with declining birth rates) have contributed to an increasingly ageing population globally, and particularly in Europe (Alexopoulou et al., 2022; Dąbrowska, & Lubowiecki-Vikuk, 2020). The median age of the European population is expected to increase by 4.5 years, reaching 48.2 years by 2050. The ratio of people aged 65 to 74 is expected to increase by 16.6 % and those aged 75 to 84 years by 56.1 %. The number of centenarians in the European Union (EU) is predicted to reach 500000 by 2050 (Eurostat, 2023). With this demographic shift, researchers have been called upon to analyse the characteristics of the ageing population to ensure that older individuals can maintain their health and achieve active and successful ageing (Abud et al., 2022). Ageing is a gradual process of continuous change that occur at the physical, cerebral, cognitive, emotional, and social levels, and corresponds to the period that begins immediately after adulthood, at 65 years of age (De Beni, 2009). As ageing is the last stage of development in an individual's life cycle, it is often associated with the onset of physical and cognitive decline. The scientific literature has largely focused on dispelling this false myth of decline, and studies have revealed the possibility of successful ageing and of cognitive maintenance (Kourtesis, & MacPherson, 2021; Sharifian et al., 2020). Numerous studies have demonstrated that older people are capable of not only further developing existing skills and competences but also of acquiring new skills, which itself is indicative of well-maintained cognitive abilities (Vásquez-Amézquita, 2016). These abilities are particularly useful in modern society due to the rapid development of Information and Communication Technologies (ICT) that have revolutionised people's lives and lifestyles. Older people have to utilise tools that simply did not exist during the most active phase of their life (Mubarak, & Suomi, 2022). With the increasingly widespread use of the Internet, computers have transformed into a tool for communication and interaction between people and organisations, instead of being of relatively niche interest as they were to a large extent forty years ago. Coupled with the saturated coverage offered by mobile devices, this technological shift has meant that more people are available and accessible for more of the time than ever before, including both the young and the much older members of society. Recent economic changes have led to the gradual abandonment of cash, replacing it with less concrete instruments, such as online payments and credit or debit cards, which require open-mindedness and familiarity with technology. In fact, some processes, from reserving a table at a restaurant to applying for state support, have moved online to such an extent that those who lack the necessary competences find themselves excluded from actions that they once would have considered as simple or relatively unproblematic.

The older person, therefore, finds themself living in an information society that has undergone remarkable and rapid transformations within a short period of time. Although the presence of good cognitive abilities and a good cognitive reserve are fundamental to life in this transformed society, they must be supported by a system that promotes an efficient and accessible interaction between older people and ICT. If not appropriately supported, these ICT innovations can lead to the expansion of a digital divide, an invisible wall that separates those who have access to ICT and those who do not (Sparks, 2013; Van Dijk, 2017). The presence of the digital divide represents a problem for society, above all in term of exclusion. Van Dijk (2005) associates the digital divide with the inequality in the participation in society across three perspectives: lack

of innovation and economic growth; lack of economic, social, and cultural equality; and lack of security. The size of the divide is greatest and most frequently observed in terms of the age of the person.

The set of factors that characterize the digital divide among older people is today encompassed by a specific part of the literature on the subject, called the 'digital grey,' which refers to the specific gap between ICT and older people (Mubarak, & Suomi, 2022; Tomczyk et al., 2019). ICT could provide older people with considerable advantages and benefits, and has become increasingly important for accessing services (for instance digital health and mental health), circulating information, and building and maintaining social relationships (Bonfiglio et al., 2021; Chen et al., 2022; Huxhold et al., 2020; Stara et al., 2022). For instance, during the COVID-19 pandemic, technological tools provided opportunities for e-health and for social contact (Valokivi et al., 2021; Vargo et al., 2021). The grey divide can cause the digital exclusion of older people. Digital exclusion or e-exclusion can isolate an individual from the information society, leading to unequal access to ICT activities and resources. The digital exclusion of older people is a global issue above all because it is tied to quality of life and negative aspects such as loneliness, social isolation, and negative mental and physical health outcomes (Chen et al., 2022; Pedrós Barnils, & Schüz, 2022). Understanding the reasons for the digital gap is an important precursor to identifying effective actions and strategies by which to bridge the gap. The challenges of ICT use and digital exclusion among older people are complex and include many and multifarious mediating factors. These factors can be categorised as internal/individual (e.g., psychological aspects, motivational factors, fear of new technologies, attitude towards technology, cognitive overload, personal experience, self-marginalisation in the information society, physical limitations, technostress, and economic determinants) or external/contextual (e.g., resources, poor infrastructure, inadequate technology, lack of sufficient technological tools, characteristics of new media, social-cultural reasons, and lifelong learning opportunities) (Abud et al., 2022; Alexopoulou et al., 2022; Chaouali, & Souiden, 2019; Dąbrowska, & Lubowiecki-Vikuk, 2020; Kuc-Czarnecka, 2020; Van Dijk, 2005; 2017; Van Deursen, & Van Dijk, 2015).

The issue of the digital grey has grown in recent years, with even the European Parliament underlining on 13 December 2022 the importance of actions intended to increase digital inclusion (https://www.europarl.europa.eu/doceo/document/TA-9-2022-0438_EN.html). Elsewhere, Kuc-Czarnecka (2020) argues that e-exclusion in Poland is caused mainly by territorial areas being particularly vulnerable to digital deprivation due to infrastructural deficiencies, such as lack of access to stable internet connections or poor penetration of mobile network signals into rural or mountainous areas. Other research (Dziuba et al., 2021) has reported on technical restrictions concerning the availability of the Internet among older Polish adults. The same study presents mental barriers connected with a lack of interest and motivation, specifically towards Internet use.

Older citizens who attend the University of the Third Age at the University of Economics in Wroclaw report that they use the Internet for keeping in contact with people, for online shopping, and for obtaining information on their health status (for instance, by accessing laboratory tests online instead of needing to return to the doctor's office to collect a printed copy of the results). Institutions play a key role in promoting computer literacy to those that need it, and in encouraging conscious use of ICT. There are ways and means available to remove both individual and contextual barriers, and by organising training courses with teaching methods that overcome resistance to new technology, older people can be better motivated to learn about and use ICT.

2. MATERIAL AND METHOD

2.1. Aim and subject of the study

The aim of the research was to –delineate the barriers to the digital inclusion of older people according to the views espoused by the wider society, and for that purpose the subject of the response was obtained through interviews with adults who are themselves not older people. The objective of the research stems from the need to redefine the formation of the digital competences of older people, as well as to increase the effectiveness of this process, taking into account accumulated social knowledge. The research objective is also related to the need to discover new solutions to support the digital inclusion of groups with the highest digital exclusion rate. The research objective not only has a descriptive function but is one of the elements of the implementation of the international research project "REMEDIS - Rethinking Media Literacy and Digital Skills in Europe".

2.2. Survey procedure and sampling

The project is part of an effort to reveal public perceptions of the obstacles associated with digital inclusion, and in the present research thirty people between the ages of 20 and 55 answered one open-ended question about the most important factors obstructing digital inclusion in Poland. Participation in the research was voluntary and included the ethical principles of social science and the internal regulations of the REMEDIS project. The interview question that the respondents answered was made available in digital form. The research tool was subject to a pilot study as well as to evaluation by an external expert.

The sampling was carried out with a purposive approach. The selection criteria were the age of the respondents, i.e. younger or middle adulthood. The research does not allow for generalisation (i.e. the determination of the scale of the phenomenon of barriers to digital inclusion), but is primarily aimed at understanding the factors that obstruct effective digital inclusion. Thirty people were recruited to participate in the study (via snowball methodology) due to typical qualitative research procedures.

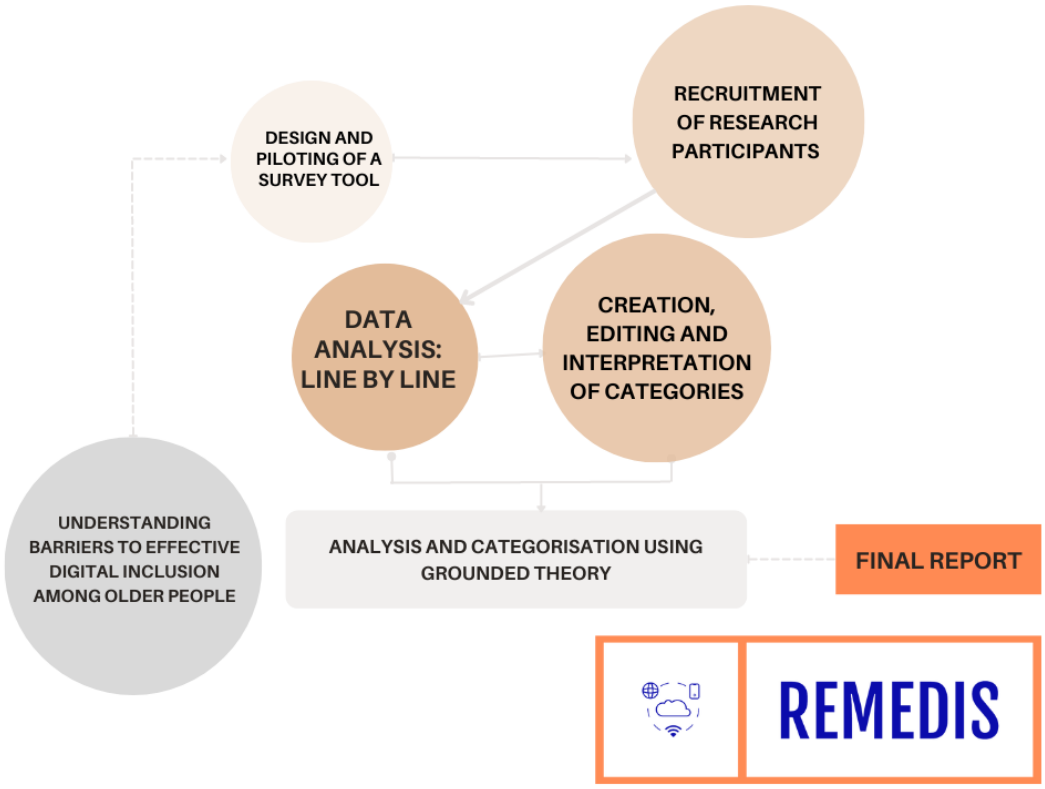
The statements obtained were analysed on an ongoing basis in terms of the emergence of categories of barriers to digital inclusion, and through this analysis the factors were either added to existing categories, or new categories were created. The analysis and categorisation were carried out using grounded theory, among other factors, due to the irreversible nature of the changes taking place in the information society over recent decades.

The research scheme used in this study is presented in Figure 1. (See next page)

2.3. Research ethics

Participation in the study was entirely voluntary. Those responding were informed of the purpose of the study, the source of funding for the study, and how the data would be processed. No information was collected in the course of the study that would identify the respondent. Each person participating in the procedure was free to opt out of the response questionnaire at any time.

FIGURE 1. Research Scheme



2.4. Research limitations

This study has methodological limitations in that it presents the phenomenon of digital exclusion and the formation of digital competences among older people by individuals who do not belong to this age group. On the one hand, this fact should be seen as a methodological limitation, as the conditions of digital inclusion are discussed by people in early and middle adulthood, i.e. individuals who are not members of the excluded group, and who can in some sense be considered as digital natives and who have developed their own competences due to the necessity of participating in an increasingly digitalised school system or of carrying out professional tasks using ICT. On the other hand, this limitation can also be seen as a strength of the present study, which goes beyond the typical research that examines the barriers to digital inclusion as it is considered by older people or experts (media educators, social and educational gerontologists) (Tomczyk, 2018).

3. RESULTS

Based on the analysis and categorisation of the contributions, eight main barriers related to the digital inclusion of older people were noted. These barriers related to: having concerns about starting to use basic ICT and e-services; lacking the need to use ICT in everyday life; feeling that new media belong to and are targeted at younger generations rather than to older age groups; problematic use of ICT due to the peculiarities of new

media; lack of educational infrastructure encouraging the formation of digital competences; physical limitations due to psychobiological conditions; and economic constraints. A summary of the categories can be found in Figure 2, while a detailed analysis of the individual barriers is presented in the following subchapters.

3.1. Fear of new technologies

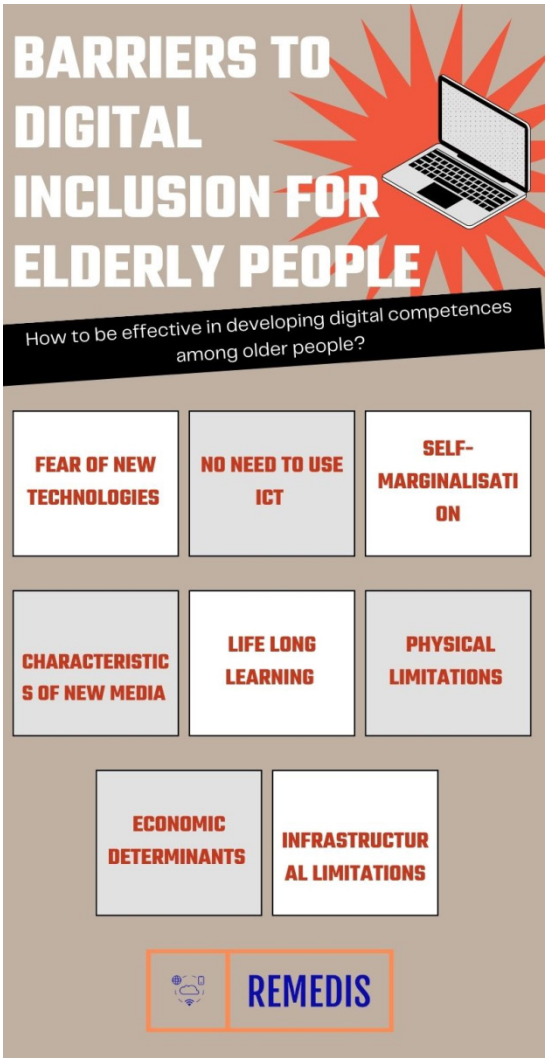
One of the most prominent suggestions put forward by the respondents concerns the perception that older people fear the use of ICT, and older people who either do not use ICT in a systematic way, or who do not use it at all, are characterized as having a fear of handling basic IT equipment and services. This condition is linked to an a priori belief that operating ICT is extremely difficult, which can be linked to the belief that any attempt to use ICT will result in failure.

> "I think one of the biggest barriers for older people towards technology is the fear of technology itself" (R1, W).

> "Fear of the unknown, belief that using modern technology is very difficult" (R14, W).

According to one respondent, older people's fears are not so much due to technical aspects (as can be seen in the responses given above), but to social conditioning regarding feedback on the style of use of new media. The same respondent also emphasises that the fears are linked to the issue of comparing the level of one's own digital competence to other people of a similar age. Thus, it is not only the perception of the difficulty of handling new media alone that obstructs, but also the social interactions resulting from handling ICT.

FIGURE 2. **Overview of the barriers to digital competence among older people**



> "Another issue is also the fear of the opinion of others, perhaps comments against them. Often this kind of fear is also related to an unjustified comparison to the abilities of others, which also affects the self-esteem of older people" (R23, W).

A factor associated with handling new media concerns the perceived dangers present in cyberspace. The respondents suggest that there is a group of older people who are very fearful of handling e-services due to a perception of the prevalence of online fraud or phishing attempts. This kind of fear can be understood in two ways. On the one hand, it demonstrates an awareness of the features of the information society, while on the other hand, it represents a fear resulting from an inadequate level of digital competences that includes not only elementary ICT skills but also a digital security component.

"My grandfather always asked me to buy him plant seeds online that he couldn't get from a traditional shop. He was always afraid of handling his bank account and buying through allegro [an online marketplace], he thought it was extremely complicated and was of the opinion that if he clicked the wrong thing he could give someone access to his bank account and his money would be stolen" (R10, M).

"They are afraid that if they click on something they will have to pay for it straight away" (R18, M).

"Older people are afraid to do a lot of online activities because they are not fully convinced of the safety of digital activities. It is a new world for them, very distant from the one in which they used to function. This is why they approach online transfers, bill payments, or other transactions that were previously only available to them in a traditional form with a certain reluctance" (R23, W).

3.2. No need to use ICT

Another barrier is not having the need to use a computer, internet, smartphone, or e-services. This is since older people do not always understand what activities can be done with ICT. In addition, their previous functioning in an analogue society allowed them to satisfy their life, work, and entertainment needs. Therefore, their lack of knowledge about the possibilities of new media to improve quality of life appears as a basic criterion obstructing digital inclusion as well as the development of digital competences.

"Older people don't always know what it can be used for and are therefore afraid to use it. Another barrier is the conviction that they don't need it at all, because they have lived so many years without it - so what do they need it for?" (R1, W).

"They think that the Internet for people their age is not necessary since they have managed without it all their lives so why introduce new possibilities in old age" (R11, W).

"They also think that the skill is unnecessary. Because they have managed all their life without it, why do they need it all of a sudden. Especially because in their perception there is nothing there for them" (R12, W).

Due to a lack of information about the potential benefits of using ICT, older people lack the intrinsic motivation to not only use elementary e-services, but also to transform habits linked to the analogue world.

"They are not fully aware of how the Internet works and the benefits that computer use can bring (quick access to information, paying bills remotely, etc.)" (R20, W).

"Seniors feel that the Internet for people their age is not necessary since they have managed without it all their lives so why introduce new possibilities in old age" (R26, W)

One respondent suggests that the paucity of content relevant to older people is one reason for the lack of motivation or need to use the Internet. Such declarations are directly linked to the low level of knowledge about how new media work and the resources that can be found in cyberspace.

"Older people often feel that there is no content on the internet that could be of interest to them" (R10, M).

Another category here has to do with family aspects. The involvement of the family in meeting the life needs of older people results in such needs being met in the analogue environment. Also, it is often the case that younger members of the family become surrogate users on behalf of older people in ICT mediated

activities, thus reducing both the need and opportunity for older people to explore the possibilities of cyberspace.

> "My grandmother doesn't want to learn how to use the computer because she takes care of the farm and she thinks she doesn't have time for it and she doesn't need it because she always has the possibility to get help from her children or grandchildren if she needs some information that can be found on the Internet" (R5, W).
>
> "They don't want to use the devices because often family members do it for them" (R19, M).

3.3. Self-marginalisation

Self-marginalisation results from a lack of confidence in one's own abilities, not only in relation to ICT use but also from a negative self-assessment of one's effectiveness in learning to use new devices.

> "Seniors are embarrassed, afraid and also distrustful of the latest technology. They are often not convinced about the value of the latest technologies, assuming in advance that they will not learn anything and, worst of all, they will definitely break something because they are older" (R11, W).

The development of digital competence is linked to the evaluation of one's own cognitive or motor processes. According to the respondents, some older people are characterised by impaired perceptual processes as a direct result of their age. This oversimplified assertion needs to be made more specific, though this does suggest that the group of older people is heterogeneous in nature. Ability to use basic ICT is not necessarily related to the age of the user but instead connects to a wide variety of biopsychosocial determinants. Age may well even come across as an excuse for not using ICT rather than a rational justification.

> "Older people say they are too old and that they are sight-impaired" (R2, W).
>
> "Age - I'm too old" (R3, W).

Self-marginalisation is associated with negative feelings linked to deficiencies in the use of ICT. Overcoming such negative emotions might well be a necessary first step in moving towards digital inclusion.

> "The main barrier to older people learning to use new technologies is embarrassment. They are ashamed of their inability in this area. They think they are too old to understand it and then operate a computer or the Internet by themselves" (R12, W).

Issues of self-perception is crucial in the context of the intensive development of technology. The dynamic development of ICT accounts for some of the digital exclusion in groups such as older people. The rate of change and innovation has no analogue equivalent – many older people likely still own the same landline telephone that they owned thirty years ago, but this year's smartphone models and the latest versions of the operating systems they use little resemble those of five years ago, and even the vocabulary around such devices and e-services can change at an intimidatingly swift pace. Words enter the language, become popular, and die out in a brief space of time – it is rare to hear people speak of 'blogging' now but it was the central activity online only twenty years ago – and so there is reason to sympathise with older people who feel that these changes occur too quickly for them to keep up with life in the information society.

"Internal barriers, on the other hand, include beliefs, older people thinking it is too late to learn, negative perceptions of themselves as an older person. This is also accompanied by a fear of new things, a lack of self-confidence, exacerbated by a poor understanding of modern technology" (R15, W).

"They think they will not be able to keep up with technological advances" (R18, M).

The respondents point to a contradiction in the thinking of older people about the very nature of the information society. There is a preconceived notion that, since ICT was brought into the world by younger people, it was created to satisfy the needs of the younger generation at the exclusion of the older. This is a false dichotomy of sorts – the fact that much innovation comes from younger generations does not mean that older generations are purposefully excluded, and in fact many new e-services, such as the ability to view laboratory test results online instead of having to go to the lab to collect the print-out, and the ability to have medical prescriptions delivered to an electronic device instead of risking infection by visiting the doctor in person, appear to have been designed with precisely this demographic in mind.

"Their belief that electronic equipment is reserved for younger generations. These people think that they are too old for that, that they won't understand it and they don't even try to learn these competences. They think that the world of technology is not for them" (R29, W).

"Stereotypical thinking - the Internet is not for seniors" (R7, M).

3.4. Physical limitations

As the body ages, there are visible biological changes that affect, for instance, hand-eye co-ordination. However, as previously mentioned, this demographic is heterogeneous and so it is not true that all older people experience the same changes at the same time. It is generally true, though, that for many within this demographic, changes in bodily function have an effect on ICT use and on the ability to learn about ICT. The deterioration of the senses and of fine motor skills can become a factor that inhibits the use of ICT.

"Physical barriers - impaired vision and hearing, trembling hands" (R4, W).

"Reduced physical fitness may be a reason why seniors do not undertake education in the use of new technologies" (R5, W).

"Physical problems e.g. impaired fine motor skills" (R20, W).

The respondents consider more than just the physical processes involved in the use of ICT, taking into account such issues as memory as well. It is important to consider the effect of such phenomena as muscle memory – the ability to learn a process and to be able to do it without conscious effort. The ability to create new patterns degrades with time, leading to issues such as those discussed below that must be accounted for in any attempt to overcome the barriers to digital inclusion in this age group.

"I have a neighbour who I help recharge her mobile phone because she can't remember what she has to click on one by one. So I think poorer memory functioning causes a lot of problems' (R8, W).

The limitations presented in this section offer important insights in the discussion on the biological determinants of the formation of digital and media competence. While the biological limitations are indisputable, they are not at the same time factors that are present in the same intensity in all older people due to the

heterogeneity of this group. In addition, contemporary developments in e-services and ICT make it possible to compensate for certain deficits through options available in software and devices – though many features of what might be termed 'accessibility' are not installed in out-of-the-box solutions. The irony is that to use such functionality, you need to have sufficient digital competence in ICT not to need that functionality in the first place.

> "Older people can be negatively affected by computer use due to, among other things, poorer eyesight, not realising that they can change the size of letters in a text and also increase colour contrast" (R10, M).

> "However, it is often the case that older people feel a physical block against new technologies. They feel they have poor eyesight, they don't feel confident, they are afraid they will do something that will break the equipment" (R13, W).

3.5. Economic Obstacles

One noticeable factor associated with the emergence and entrenchment of digital exclusion is insufficient financial resources. Older people may find that they lack the financial resources for basic ICT equipment, perhaps due to the low-level of pension benefits that they receive as well as to the prioritization of other activities, such as paying for medicine or dietary supplements. This lack of resources might also impact the older person's ability or desire to pay for training on the use of ICT equipment or for participation in professional courses shaping digital competences.

> "One of the most important barriers to older people learning to use new technologies is financial, older people live on a small income, thus they cannot afford to buy a computer and go on a paid course" (R27, W).

> "Older people cannot afford to buy equipment" (R5, W).

> "It is also a barrier that not every older person can afford to buy a computer, laptop or smartphone. Their pensions are often low and any savings are spent on medicines and medical tests" (R29, W).

The financial barrier applies not only to more expensive devices such as laptops, desktops and printers, but also to what might be considered the most basic devices such as smartphones. Though the cost of a reasonably good handset has fallen in recent years, such smartphones tend to become obsolete within a short period, and as they approach the end of their lifespan, new challenges are presented to older users, such as having to manage the limited storage capabilities of cheaper devices.

> "An example from the environment: a neighbour really wanted to learn how to use a smartphone, specifically the photo-taking function, but she could not afford to buy a new phone" (R30, M).

Having sufficient financial resources to purchase equipment is not the only barrier preventing full participation in the information society. Lack of sufficient recurrent funding is also a barrier to the use of e-services due to the systematic costs associated with fees, either connected to the use of a specific e-service with a subscription model, or to such services as mobile data. Given the current stage of development of the information society, in which access to the Internet is as important as, say, access to the electricity that powers IT equipment, the aspect of fixed Internet charges becomes a critical factor.

> "Lack of equipment connected to the network and Internet costs too high" (R17, M).

3.6. Infrastructure

Successful inclusion requires solutions to be available in the immediate area. Despite the intensive development of educational facilities aimed at older people in large cities, there is a persistent accessibility gap in smaller towns and rural areas. In addition, universities of the third age or senior citizens' clubs are institutions that do not always offer computer courses. The accessibility of institutions supporting the acquisition of digital competences appears to be an ongoing challenge.

> "They do not always have the opportunity to use the courses e.g. they are too far away" (R5, W).

> "In my area there are rarely free computer training courses, if they are organised there are few places on them. Another limitation is transport, there are many places in my municipality where there are no or very few buses. As a result, older people have no way of getting to the course" (R27, W).

It is rightly noted by one respondent that infrastructural solutions can also apply to intergenerational education within the family. Grandchildren and children in the family environment appear as natural resources that can also be included in the process of shaping basic digital competences. The potential for social or educational support resources is currently still an overlooked element for successful digital inclusion.

> "Lack of support and help from those closest to them in this respect, lack of understanding of their fear of failure, lack of people who can and want to explain technology to them in a clear, accessible and mutually satisfying way" (R14, W).

3.7. Specificity of new media

The ways in which new media are used do not build on the ways in which analogue solutions to accessing information or communicating used to work. The techniques and approaches most familiar to older people have no online equivalent – to write a letter, one had to know how to hold a pen, but with the deterioration that comes with age, older people could purchase a larger pen or use a specially-made grip; typing an email on a screen measuring only five or six inches diagonally across, with half of the screen taken up by a full QWERTY keyboard, can seem like an insuperable problem, especially for older people who are unfamiliar with the accessibility options provided by their device.

> "They find it cumbersome to operate smartphones because of the small buttons and the small size of the letters" (R10, M).

> "Some things they try to do by force, e.g. pressing the icons on the phone too hard, which makes an app not turn on" (R30, W).

The perception of the usefulness of new media is another factor limiting both the use of modern devices and useful e-services. A lack of understanding of the possibilities inherent in new media creates a number of misconceptions about the benefits of elementary solutions present in the information society.

> "Older people are of the opinion that the phone is for calling and not for playing therefore they do not invest in smartphones" (R27, W).

> "I know from my own experience that older people don't want to change anything in their lives, they prefer the traditional ways of getting information, communicating or doing things that can be done over the phone from home" (R22, W).

As technology develops, the language used to describe either the technology itself or the possibilities of new media develop in tandem, though given the global nature of technology many of these new words are

borrowed from other languages that older people might not be familiar with. This makes the problem more challenging – not only does it feel like older people must learn the language of technology, they must learn other languages too. Messages displayed on electronic devices are written in a vernacular that many older people will find obscure and impenetrable, just as a layperson listening to a conversation between doctors might find that they understand but one word in five.

> "Language barriers - incomprehensible messages for older people, often in English" (R4, W).

The new language of technology is evidenced in material such as advertisements online; advertisers use increasingly sophisticated means to attract their viewer's attention, and this too can prove an obstacle to older people.

> "Incomprehensible advertising" (R16, W).
>
> "Older people need more time to get used to using technology. Their pace is slower, which can be cumbersome, for example when using the internet, when every now and then there are adverts that you have to turn off yourself" (R6, W).

The world of ICT is virtual in a way that the analogue world never was. To send a letter, you would place the document in an envelope, affix a stamp, and place the letter in the postbox. The system was comprehensible and could be described by a non-expert. To send an email, the only connection with the analogue domain is in the icon of an envelope that some services use to denote the creation of a new email. Once sent, the process becomes hidden, and can only be explained through expert knowledge. The skeuomorphic approach of representing virtual processes with relics of the analogue age (or even the early digital age – the 'Save' icon is often represented as a floppy disc, which is an object many younger people may never have encountered) might do little to reassure older people when they use ICT, and might result in a lack of a conceptual understanding of the opaque processes involved in ICT, such as online banking (where is the money actually kept?), cloud storage (where are my files actually kept?), and online shopping (where are the things I want to buy actually kept?), to name but a few. An inability to understand the concepts that underpin these processes might itself be a barrier to digital inclusion.

> "The internet seems to them to be something abstract" (R18, M).

3.8. Life Long Learning

Activities related to the acquisition of digital competence are inextricably linked to learning and teaching processes. Developing ICT skills requires going beyond previously accumulated knowledge and skills. For older people, digital inclusion often involves entering a completely unknown and complex area.

> "It's hard for them to learn new things - there were no computers in their youth" (R17, M).

One respondent highlights the issue of not being able to enter lifelong learning due to learned helplessness. Meeting life needs mediated by new media in some families is to the detriment of the development of older people's digital competence. This is a phenomenon that, despite the best intentions, is at the same time becoming a barrier to effective digital inclusion. By performing ICT-mediated actions on behalf of their older relatives, members of the younger generation may be doing more harm than good.

> "Another barrier is that children or grandchildren do not want to teach them how to use new technologies. They think they don't need it, moreover, they constantly bail them out, they don't let them try, for example, to pick up a parcel from a parcel machine or to withdraw money from an ATM" (R27, W).

In the context of lifelong learning, the respondents point out that effective digital inclusion via the formation of digital competences is very often carried out in the home environment. However, there is a reason that teachers must first become qualified, and those who attempt an amateur version of the pedagogical process might not adopt approaches that benefit older people or that overcome some of the obstacles described thus far. Addressing this type of barrier is particularly important when older people do not have access to professional venues for acquiring digital competences (e.g. senior citizens' clubs, universities of the third age).

> "There are few people who train older people. Those close to them often do it hurriedly and on the run, with the result that the older people understand nothing and become even more discouraged. This needs patient and trained people who explain everything step by step" (R29, W).

> "They don't want to ask for help and there are often people around them who don't have enough patience or the right attitude towards older people" (R30, W).

It is difficult to haracte digital exclusion if there are internal barriers related to the acquisition of new competences, even if these are competences considered key to functioning in the 21st century.

> "They are also haracterized by an attitude full of prejudice against anything new, and overcoming their aversion to change does not come easily to them" (R24, W).

4. DISCUSSION

Digital exclusion is a multifaceted process with many determinants. The present research carried explored the barriers to digital inclusion for older people that can be identified in society. The majority of the respondents highlighted the importance of the various fears that are associated with the use of ICT in the minds of older people. The fear of new technology is a natural phenomenon (Ball, & Holland, 2009), and is associated with the belief that using the web and handling new media is difficult (Chiu et al., 2019); there is also the associated fear of being judged by others. However, it is worth emphasising here that older people also see many benefits and opportunities from using the internet and come to find it difficult to imagine life without it (Chiappe et al., 2020; Holda, 2008; Martinez-Pecino et al., 2013). However, balanced against the irrational fears held by many older people are the wholly rational fears of being a victim of cybercrimes such as phishing and identity theft. The prevalence of cybercrime has increased dramatically in recent decades and has become part of everyday life (Connolly, & Wall, 2019; Leukfeldt et al., 2013).

Motivation is another key factor, and is a prerequisite for starting to use modern technologies (Van Dijk, 2005). This appears equally true in Polish studies, the results of which show that the key form of digital exclusion that determines non-use of the Internet is motivational exclusion (Raport, 2021). Nearly 66 % of Poles who do not use the Internet justify this by their lack of a need to use the Internet to satisfy important

matters in life, coupled with a lack of knowledge of what the Internet can be useful for. Building motivation to use digital technologies and strengthening digital competences, especially among older people with a low level of education, seems to be a primary issue. In addition, promoting the availability of content designed to meet the diverse needs of older people can be an important measure to break down motivational barriers. It can also be noted that people expressing a lack of need for new technologies are generally less accustomed to using the Internet, and it is not surprising then that they have an aversion to technology (Nymberg et al., 2019). Such beliefs seem to stem from having low to zero experience with digital tools.

Self-marginalisation is often a barrier to online access. The findings indicate that older people doubt their ICT proficiency and rate their digital competences as relatively low. It is clear that impaired cognitive functions such as reduced attention span and memory, as well as problems with perception, can affect adaptation to the digital environment. Certainly, information processing is crucial in the learning process. However, it should be emphasised that cognitive impairments, if not associated with multimorbidity, do not affect basic activities of daily living and do not interfere with the learning process. Rikard et al. (2018) and Berkowsky et al. (2015) investigated factors that caused older people living in care homes and living independently to stop using ICT over time. Both studies found that older age and increased frailty (determined by limitations in daily activities) are not related to cessation of Internet use. Thus, age is not a barrier to ICT use, but is rather proffered as an excuse not to undertake new tasks. It is worth noting, however, that ageism too is a barrier to digital inclusion. This can lead to a reduced sense of self-efficacy among older people (McDonough, 2016), and a lack of motivation and confidence in using these technologies (Neves, & Amaro, 2012). Our research confirmed the stereotypical mindset of older people, indicating that ICT is only for young people. This has the effect of a turning away from modern technologies and the claim that access to them is not necessary for older people. Similar results are presented by Fischer et al. (2014) stating that older people tend not to keep up with current technology because they are limited by their interaction with technology and thus do not develop the necessary skills.

Physical limitations can also be a factor in digital exclusion. They are the effect of the biological ageing of the body, i.e. a reduction in the functional reserves of individual organs. This means that, even in its most successful model, ageing becomes a substrate for a reduction in fitness despite the absence of revealed disability characteristics. Declining fitness narrows physical capabilities, resulting in slower reaction times, the deterioration of stimulus processing and integration, a decline in sensory performance, and hearing impairment. All these factors can limit effective digital inclusion. Although the use of technology by healthy older adults has been increasing in recent years (Schulz et al., 2015), the situation differs for people with multiple diseases and functional impairments, and for the elderly.

Not insignificant are the economic constraints that clearly impede access to the Internet. Digital inequalities are a form of social inequality deeply rooted in the socio-economic context (Haight et al., 2014; Robinson et al., 2015). The lack of adequate resources to purchase basic ICT devices is often associated with low pension and disability benefits in Poland. Regardless of the issue of sources of income, the ability to manage finances in such a way that all the most important needs from the point of view of the older person are met remains an important issue. Income enables older people to live no more than modestly. The poor financial situation of a household forces its members to make various savings. In 2021, there was a comput-

er in only 46.9 % of pensioner households against the average across all groups in Poland of a computer in 75.4 % of households. (GUS, 2022). The existing inequalities between older and younger users in terms of access to ICT is also linked to the fact that older people generally connect using outdated devices (Hanson, 2010). The findings show that the financial barrier applies not only to more expensive devices such as laptops and desktops, but also to more elementary devices such as smartphones. Only 33.4 % of people over 65 in Poland use a smartphone, according to the National Media Institute, and 13.8 % of older people use a laptop or notebook. (KIM, 2022). Financial capabilities also allow access to the Internet, and the lack of such access affects the alienation of older people and excludes the possibility of actively using the web (Cruz-Jesús et al., 2016; Poushter, & Stewart, 2016; Robinson et al., 2015).

Infrastructural barriers also stand in the way of effective digital inclusion, with there being an insufficient number of places and insufficient access to such places in which older people can develop their digital competences. The report "Digital DESI for 2022. Poland" (Raport EU DESI ¡, 2022) shows that Poland ranks 24th among the 27 EU countries in terms of the human capital of the digital society. In turn, Socio-digital exclusion in Poland 2021 (Raport, 2021) reports that more than half of those (55 %) who have never used the web live in rural areas. Among all rural residents, the group particularly at risk of digital exclusion (as well as its social consequences) are older adults. This same report recommends building motivation to use digital technologies and strengthening digital competences especially among older people with a low level of education. Counteracting infrastructural barriers guides the strategy behind the launch of the Digital Development Clubs Project (Local Digital Competence Development Centres), which will provide support to older adults, among other goals. The project is planned to be implemented as part of the European Funds for Social Development 2021-2027 programme. The Digital Development Clubs to be established will be a public place for digital education and for familiarising local communities with new technologies. The plan is to launch about 2500 digital clubs, potentially in each municipality, and to prepare about 5000 educators associated with NGOs. and other agents of digital competence development. As part of the pilot programme, the Clubs are to be inaugurated in 60 municipalities in 2023.

In the context of infrastructure, it is also worth highlighting the importance of the family environment as this is where intergenerational education in digital competence often takes place. This kind of social support allows, through grandchildren or others in the family, the acquisition of the essential skills necessary for online participation (Carlo, & Bonifacio, 2020; Cheng et al., 2022; Lee, & Kim, 2019; López Seguíet al, 2019). Nowadays, intergenerational learning is becoming key to enabling older people to be part of the digital transformation. In the past, the younger generations were the concern of the older generations, but there is now evidence of a reverse process of intergenerational learning (Gadomska-Lila, 2020). The benefits of this form of learning include immediate or long-term learning outcomes. The process of intergenerational learning focuses on the two-way nature of the relationship and the learning process, and is seen as a priority strategy in encouraging older people to become more active users of technology, especially in societies with a rapidly ageing population.

New media have their own peculiarities. The increasing miniaturisation of devices makes it difficult for older people to use some devices, such as smartphones with a relatively small touchscreen, though other

devices, such as wrist-worn technologies such as smartwatches, could actually help older people to age successfully, by, for instance, making it easier to monitor blood pressure and heart rate (Lázaro et al., 2020). New media can promote independence, improve quality of life (Demiris et al, 2004; Lewis, & Neider, 2017; Wagner et al, 2012). The rapidly shifting lexical demands of new media is a barrier for older people, as new language leads either to a lack of understanding or to potentially serious misunderstanding and can cause older people to be reluctant to embrace the digital world and stay abreast of new developments. Furthermore, the use and acceptance of ICTs are closely related to older people's experience and attitudes towards ICTs (Nayak et al. 2010).

The penetration of technology into everyday life has become the basis for the learning process of older people in line with the strategy of Life-Long Learning. In Poland, the idea of lifelong learning for older people is largely implemented in Universities of the Third Age (Gierszewski, & Kluzowicz, 2021). Acquiring digital competences encompasses a variety of skills, including accessing digital media, using ICT, critically evaluating aspects of new media and media content, and communicating effectively (Sahin et al. 2010). This provides an opportunity to improve the quality of life and leads older learners towards the conviction that knowledge allows them to create themselves, i.e. to be themselves, and to go beyond the limitations accepted by others. It is noteworthy that the lifelong learning strategy responds to the growing demand for digital technology for all learners, and the goal of this learning is also connected to the prevention of social exclusion. Though sources of motivation are various, the perception of benefits could promote a greater willingness among older people to learn (Pihlainen et al., 2021). In addition, older people's motivation to acquire digital skills stems from a desire to stay up-to-date in the modern world (Costa et al. 2019; Guillén-Gámez et al., 2020; Sastre Reyes, 2019) The benefits of learning digital skills are invaluable and are always worth highlighting and reminding people of.

5. CONCLUSIONS

The results of the study provide insight into the process of the formation of digital competence among vulnerable groups in the digital inclusion process. Inclusion in the digital society is essential in the modern world, so digital inclusion interventions should focus on eliminating barriers. In our research, we sought to understand the determinants of inclusion.

Many societies face the challenge of an ageing population, and information technologies are becoming increasingly important in general as well as for older people. Older people do not constitute a homogeneous group in terms of health status, mental and physical fitness, or material situation. This forces us to consider old age as a differentiated period of life. The adaptation of the ageing population to technological developments and successful ageing have become important issues to be addressed. The findings of the article can serve as a basis for dealing with these forms of the digital exclusions of older people in order to increase their digital inclusion, which can improve their quality of functioning in the long term. The increased demand for digital skills will continue to grow rapidly. Given that their competences likely decrease with age, action for older people is essential. This study aims to contribute to raising awareness of the needs of older people and to inspire further research into overcoming the obstacles that exclude older people.

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