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Teaching older people internet skills to minimize grey digital divides

Developed and developing countries in focus

Farooq Mubarak
Department of Information Systems Science, Turku School of Economics, University of Turku, Turku, Finland, and

Michael Nycyk
Department of Internet Studies, Curtin University, Perth, Australia

Abstract

Purpose – This paper aims to explore how older people in developed and developing countries are affected by the grey digital divide. It argues country type and culture influence older people's willingness to access and learn internet skills. Using the knowledge from researchers informs policy, funding and delivery of appropriate skilling to minimize this divide.

Design/methodology/approach – A systematic literature search using specific keywords to locate digital divide research, specifically pertaining to older people across country types.

Findings – Despite increased internet access and affordability, older people still face challenges in learning internet skills. Country type, economic challenges and cultural beliefs need to be considered in minimizing the grey divide. Governments recognize the importance of funding such teaching but evidence-based research must continue to inform policy to maximize funding and solve the many physical age and cultural issues affecting older people's access to internet skills learning.

Originality/value – This paper argues that research in developing countries into minimizing the grey digital divide is a crucial undertaking. As the internet continues growing in developing countries, finding solutions that consider cultural and age differences issues is crucial to the success of having internet literate societies that have growing populations of older people seeking to use it.

Keywords Culture, Older people, Developed and developing countries, Grey digital divide, Information and communication technologies (ICT), Internet education and skills

Paper type General review

Introduction

Minimizing and solving the digital divide has consistently preoccupied researchers. A digital divide is officially defined as a gap that people, business and geographic areas have when seeking opportunities to access and use information and communication technologies (ICT's) and the internet for a wide range of activities (Organisation for Economic Co-operation and Development, 2001). A specific variant is the grey digital divide which identifies problems older people, usually, but not always, those aged over 65 years , have in accessing and using the internet. The digital divide does not solely refer to disparities between rich and poor people or countries but also to many other complex factors that affect ICT use in developed and developing countries (Cruz-Jesus *et al.*, 2012; Kyriakidou *et al.*,

Journal of Information, Communication and Ethics in Society
Vol. 15 No. 2, 2017
pp. 165-178
© Emerald Publishing Limited
1477-996X
DOI 10.1108/JICES-06-2016-0022

2011; Vicente and López, 2011). The emerging disparity for older people is teaching them the necessary skills for using the internet rather than its cost and access.

This paper explores the problem of minimizing the grey digital divide. The need for older people to have basic computer skills and knowledge has become imperative if they are to effectively participate in society (Poynton, 2005). Research demonstrates that making older people skilled does minimize the impact of the digital divide (Cohron, 2015; Real *et al.*, 2014). However, recognizing and articulating the complex and differing problems arising due to the type of culture and society an older person lives in is crucial to helping fund and implement teaching strategies that minimize it.

Researchers and governments are addressing the social inequality that the digital divide creates for older people (Sassi, 2005). What has been increasingly found is that teaching internet skills, specifically the skills of finding, assessing and using information across many types of internet applications and platforms, is dependent on the availability of resources, the type of country, its cultural beliefs and if older people wish to learn them. This review creates an awareness of these problems and their relevance to the grey digital divide through the analysis of the work of many digital divide researchers across academic disciplines.

Paper organization and methodology

The paper is organized by first articulating why older people possessing internet skills is a vital ethical issue to review. After explaining the terms used in this paper to clarify its context, it moves to examine evidence-based studies demonstrating the predominantly successful minimization of the grey divide in developed countries. The grey divide is then examined in terms of the challenges for minimizing it in developing countries, where culture can strongly influence who obtains these skills and how they are taught. The paper's conclusions argue for the teaching of internet skills to be a government funded priority for all societies and offers recommendations for minimizing it.

To explore this topic, a large body of literature was consulted. The literature review is appropriate for constructing a convincing argument, providing the basis for sophisticated and convincing research (Bootey and Beile, 2005) while summarizing current knowledge (Aveyard, 2014). Patton (1990) states that careful data selection regarding the findings is an essential step towards credible evaluation research. This was achieved by the following, consulting Mubarak (2015) and Khosravi and Ghapanchi's (2016) similar digital divide studies methodologies for finding useful literature:

- making systematic searches of literature databases using dates between 1996 and 2016, when research on the digital divide significantly increased, using databases such as JSTOR, ScienceDirect, PubMed, Sage and ProQuest;
- using keywords such as "older", "elderly", "aged" and "senior" to maximise the finding of studies, aided by more complex keywords such as "digital divide", "grey digital divide", "older people skilling" and "older people internet"; and
- understanding the range of issues regarding older people, teaching and the digital divide by selecting and assessing research articles for relevance and insight.

The results of the search were classified according to whether the older peoples' experiences of the digital divide occurred in a developed or developing country. Classification according to results and country type was the most useful strategy for finding insights; however, the study's methodology, though reported, did not influence article selection as it is considered

for this review that results, not methods, are more important to build a picture of the digital divide's effect on older people. Nevertheless, for completeness, the methods used in the study are reported for transparency so the reader knows the type of study undertaken.

Key concepts and definitions

The complexities of ageing, increasing human life spans and the rapid uptake of computer technologies are factors influencing the need to learn internet skills. The grey digital divide specifically affects those aged over 60 years; however, the perceptions of what is old age are changing. For this paper, 60 years of age is used, but it is acknowledged that this definition is contested. Currently, those aged over 60 years may experience issues that prevent their digital inclusion in society (Wright, 2010), but governments and ITC companies view this group as increasingly important as longevity rates increase (McMurtrey *et al.*, 2008).

Although obtaining internet skills is of central importance for older people wishing to minimize their experience of the grey digital divide, it is important to acknowledge other issues impacting on them research has found. van Dijk (2005, 2006) identifies the following access issues affecting older people: motivational access, material access, skills access and usage access. Motivational access is important as he states there is a sharp decline after 40 years of age in using the internet (van Dijk, 2006). Since publishing his research, the motivation to learn digital skills has increased with many of life's business and personal activities increasingly conducted online. Although material resource access, like physical equipment such as computers, is vital, older people need the face-to-face or online tutorial support to successful use the internet and other ICTs.

A third concept influencing the obtaining of internet skills education is the type of country where the older person resides. For this research, countries are crudely classified as being developed or developing. However, these classifications are contested and they are not formally recognized by organizations such as the International Monetary Fund, the World Bank or the United Nations. Nevertheless, there are differences between developing countries and developed ones (Barke and O'Hare, 1984). The characteristics of developing countries are, for example, low to no wages, poor health and education standards, famine, hunger and a lack of infrastructure. Sullivan and Sheffrin (2003) offer further definitions, such as the characteristics of having a less developed industrial base and a lower human development index in comparison to other countries.

The key concepts in this review that define its framework are that human age, type of country and access to resources influence perceptions of the digital divide. It is acknowledged that a country can move from developing to becoming developed for many reasons including access to better ICTs and internet infrastructure. However, the literature used in this review was noticeably divided between types of countries where the research of older people using the internet was located.

Grey digital divide issues and impacts

Internet skills education is a crucial part of minimizing grey digital divides, impacting on older peoples' decisions and choices to use technology. Older people are curious about using ICT for many reasons. It is also almost necessary to have some skills in using technology. For example, Russell and Young (2015) identified how older people needed skills to operate complex digitised entertainment systems. Governments have been pro-active in recognizing that training in computer and internet skills is vital as is creating strategies to support low cost or free training (Clark *et al.*, 2004). Researchers agree that digital divide policies for older people must simultaneously address access and skills issues (Mubarak, 2015; Noh and Yoo, 2008; Notley and Foth, 2008).

In developed countries studies, a lack of internet skills was found to be the primary cause of the digital divide, especially for older people. Across developed countries, large-scale studies suggest not having the skills to use the internet is hampering its adoption by older people. Significant studies using larger populations have been published in the USA (Council of Economic Advisers, 2015), United Kingdom and Europe (House of Lords, 2015; Negreiro, 2015) and Australia (Telstra, 2015). Yet, it is argued that these developed countries present greater opportunities for older people to learn internet skills than developing countries.

This is also a concern in developing countries where there are calls for the urgent education of older people in internet skills. In Colombia, where internet use is increasing, a report found that policies ensuring access and education for all citizens in digital skills must be prioritized by the Colombian Government (The District of Colombia Office of the Chief Technology Officer, 2015). But these must be supported by access to those that can teach skills. For example, although in a developing country, Australia, Alam and Salahuddin (2015) found that the elderly population in a rural area lacked essential skills to use ICT. The older people interviewed in that study stated they would like to use the internet but had little chance of learning such skills due to a lack of teachers.

These government and corporate funded studies' claims support what researchers have been long advocating; computer skills education plays a large role in older people minimizing their digital divide (Charleson, 2012). Riggins and Dewan (2005) state well the dilemma whether society does not support older people in learning internet skills; to what extent will home users be able to take advantage of streaming media, online discussions and finding information that is now taken-for-granted by those not experiencing a digital divide? As Russell (2007) concluded in her study of older people learning computer skills, older people want connectedness in their lives and desire to be included in their changing society. Hence, minimizing the grey divide is crucial to an inclusive society.

Older people in both types of countries are also disadvantaged in obtaining skills by societal stereotyping while declining is still a concern. Decades of research confirm that older people have a lack of interest in learning computer skills and a fear of computers, resulting in them often being labelled technophobic (González *et al.*, 2015; Doyle and Goldingay, 2012; Xie, 2003; Bonfadelli, 2002; Gietzelt, 2001) and often criticized for not wanting to learn computer skills (Cutler, 2006; Czaja and Sharit, 1998). However, the current view is that older people must possess knowledge and skills, digital or computer literacy to remain socially included in a society (Tsai, 2002).

Many social changes, such as a lower work retirement age in some countries, increased life span and the imperative to learn to interact with technologies, such as smart phones or computers, have increased older people's desire to learn how to use ICT. There is a body of literature that demonstrates how they are open to learning digital skills and see the benefits of using them (Blaschke *et al.*, 2009; Bowman and Burden, 2002). It is acknowledged that younger people have different uses, needs and concerns about ICT (Wagner *et al.*, 2010; Vuori and Holmlund-Rytkönen, 2005; Bucur *et al.*, 1999), but it is an ethical issue that older people must have access to the same opportunities to learn ICT skills should they desire them.

Educating older people to use the internet effectively is vital in developed and developing countries. The internet assists with gaining knowledge on issues that affect their daily lives, such as finding health information, maintaining social and family connections and using it for entertainment (Mubarak, 2015; Mordini *et al.*, 2009). Finding health information and critically examining it, as well as the use of telehealth to connect with specialists to assess health, is an area of concern when an older person does not have internet skills to access

these. This is considered a serious problem for older people experiencing the grey digital divide (Cocosila and Archer, 2010; Chetley *et al.*, 2006; Healy, 2004; Berg *et al.*, 2003).

Minimizing the grey digital divide in developed countries

The high rate of reported success in educating older people in developed countries to minimize the grey divide is well-represented in the literature and is a highly specialized area of research. Researchers investigating attitudinal factors in developed countries towards learning computer skills have found that fear, a lack of education, gender issues and the negative stereotyping of older people not wanting to use ICT's, rather than age and health issues, are the barriers to learning computer and internet skills (Lim and Tan, 2003; Bonfadelli, 2002).

Cameron *et al.*'s (2001) study, supported by previous findings in a study by Eynon and Helsper (2010), concluded that older people are less likely to have helpers available to guide them and feel less comfortable with using online computer help or printed manuals. Gietzelt (2001) found that the formal classes offered by colleges are perceived by older people to be fast-paced, directed towards younger people and requiring prior knowledge to complete the course. As Millward's (2003) study of older people in England concluded, they are more likely to state they are not interested in learning ICT skills if their previous experiences were negative.

When researching how to improve experiences and attitudes towards ICT, Knowles (1990) argued that the main desires of older people are to learn topics that fit with their previous experiences and goals. Furthermore, it is important that their tutors take an interest in the students' educational goals and provide appropriate problem-solving advice. It has been argued that increased use of computers and the internet for older people must be tied to their current skills, abilities and needs by providing education at a variety of skill levels for all students (Blaschke *et al.*, 2009; Segrist, 2004; Millwood, 2003).

Providing appropriate low-cost internet skills training will maximize creating positive attitude towards using technology for older people. Consistent findings suggest specific teaching practices and supportive learning environments do encourage older people to use ICT and, increasingly, to continue to use them. Having tutors giving reassurances and demonstrating patience in teaching these skills is associated with older people experiencing lower levels of anxiety when using computers as well as encouraging a willingness to persist with learning to use the internet and computers (McMurtrey *et al.*, 2008; Segrist, 2004; Umemuro, 2004).

To illustrate the mostly positive outcomes reported of teaching internet and computer skills to older people that minimize grey digital divides, 15 peer-reviewed studies on developed countries are presented in Table I, and 10 peer-reviewed studies on developing countries are presented in Table II. These show what was found through undertaking various types of studies in developed countries with older people. The study's authors, year of publication in chronological order and research findings are shown, and, for full disclosure, the methods used.

These studies demonstrate consistent conclusions that creating supportive teaching environments with effective lesson practices does minimize the grey digital divide because older people feel that learning the technology is worth the time and effort. Two findings from the literature are:

(1) teaching and tutoring strategies need patience and empathy, such as encouraging trial and error in learning (van Deursen and van Dijk, 2010; De Hann and Huysmans, 2002); and

Authors and year published	Findings	method
Cody *et al.* (1999)	Increasing older people's internet use reduced anxiety when coupled with tutors displaying patient and caring qualities during lessons	Mixed methods
White and Weatherall (2000)	Participants felt a constant involvement with ICT if supported by help from others. This made them see ICT's usefulness on a personal level and encouraged them to continue to learn	Interviews and observations
Shapira *et al.* (2007)	Computer and internet use contributes to older people's sense of empowerment and well-being, which then contributes to a positive sense of control and independence	Experiments
Campbell (2008)	Older learners in the study were observed to be enjoying using computers and integrating them into their daily lives when trained in digital skills	Interviews
Hill *et al.* (2008)	Family and other social support was valuable in easing fears resulting from technical jargon and the issue of internet security, which troubled those interviewed	Interviews
Rosenthal (2008)	Older women learning computer and internet skills found that support from spouses, family, friends and the community motivated them to continue learning	Surveys
Eynon and Helsper (2010)	Using the internet and the willingness to learn internet skills increased significantly if high levels of teaching support were given	Surveys
Weaver *et al.* (2010)	The findings strongly called for more access to digital skills learning due to perceived discrimination against older people who do not use the internet	Focus groups
White *et al.* (2002)	The psychosocial impact suggested learning digital skills resulted in reports of reduced levels of loneliness. Of the 100 who did the training, a large majority continued to learn after it ended. They were aided by a trainer who carried on teaching after the initial study was completed	Surveys and scale ratings
Wood *et al.* (2010)	The results gained from the sample group call for more access to digital skills learning due to perceived discrimination against older people who do not use the internet	Surveys and observations
Lee *et al.* (2011)	Exploration of the barriers older people experience. The statistical analysis suggested four constraints affecting use of the internet and ICT. They are: intrapersonal, interpersonal, structural and functional. They all influenced the teaching practices used in the lessons, which were adjusted to handle differences in the students' ages	Survey and focus groups
Sayago *et al.* (2011)	Sample of 400 older people showed that with support and persistence many issues with cognition as well as problems in learning digital skills were overcome	Ethnographic longitudinal study
Delello and McWhorter (2017)	Using iPads to train 19 older people in internet skills over six weeks. The older people gained positive attitudes towards using the iPad and were willing to continue learning and using social media to maintain connections with others	Surveys and task measuring
Okonji *et al.* (2015)	20 visually impaired older people were given lessons with more technology more suited to older people, resulting in continued use but many felt they were experiencing a digital divide due to rapidly changing technologies	Interviews
Tsai *et al.* (2015)	The 21 older people all stated that being given computer tablets and, crucially, support in learning to use them fostered both a sense that the tablets were easy to use and useful in their lives. Therefore, most of them reported positive attitudes towards using such technologies	Interviews

Table I.
Teaching research studies

Authors and years published	Findings	Method
Edejer (2000)	An African study demonstrating how cultural attitudes to using the internet prevent the use of ICT, particularly for women and older people	Literature review
Kickbush (2001)	Stated that literacy levels in Africa are tied to the digital divide, e.g. they prevent health awareness because people cannot gain information from the internet about disease	Literature review
Warschauer (2003)	Poor education given by the young to the old in schools and across communities in Egypt is hampering the learning of ICT skills	Case study
Chigona *et al.* (2009)	A range of ages in the sample, targeting those in South Africa who felt socially excluded from technology due to not being aware of the benefits of owning cell phones	Interviews
Fong (2009)	China's rural population is experiencing rapid growth in ICT use but is severely hampered by the low literacy rates of all ages in rural areas	Secondary data analysis
Eskicumali (2010)	Study demonstrated gender and age gaps because more males and younger people than older people were willing to use internet cafes and learn how to use ICT	Interviews
Tello-Leal *et al.* (2012)	Mexico's entire population is hampered by low education levels and poor social conditions, although university students are experiencing less of a divide due to ICT availability on campus	Literature review
Venkatesh and Sykes (2013)	Sample of 210 families showed that with education and support, good economic outcomes arise from the use of ICT and can bridge the digital divides in Indian villages	Field study
Gamreklidze (2014)	Russian computer hackers spread fear among those living in Georgia with virus and other cyber attacks causing a digital divide due to the fear of using the internet	Case study
Bornman (2016)	South African study with those identified as "white" in the region more open to using and learning technologies, but also finding a gender gap in internet use among all ethnicities	Surveys and interviews

Table II. Developing countries and ICT and internet education

(2) older people's goals, previous abilities and knowledge must be taken into account, thus encouraging self-directed learning.

When considering this research, it should be noted that material access in developed countries to ICT is generally higher due to the funding of such resources and because more affluent older people live in such countries.

Minimizing the grey digital divide in developing countries

The grey digital divide, and how education can help older people, remains relatively under-researched, despite a growing body of studies being published. Norris (2003) identified a range of issues hindering the learning of internet and ICT skills in developing countries including a lack of employment, shelter, food shortages, personal and community health and other survival needs in developing countries. Yet, Norris also argues that ICT use and investment across developing countries needs to be a priority to allow integration into the global economy. Published World Bank data reported that during the period 2011 to 2015 many developing countries had increased the number of internet users per 100 people, even in very poor countries, such as Sierra Leone in Africa (The World Bank, 2016).

Generally, teaching older people ICT skills in developing countries has had mixed results, depending on the circumstances and context of the group's location. However, increased access through better infrastructure, the use of mobile computing devices, lower data costs and other positive measures are helping developing countries improve living standards. Nevertheless, Kenny (2002) and May *et al.* (2014) highlight that providing information and services in developing countries through the internet alone is impractical due to high illiteracy rates, poor English skills and a lack of computer skills.

A significant and reoccurring finding in the literature reviewed is the strong role a country's culture has in influencing and hindering older people and others in seeking internet skills. Although a contested term, for this review, culture consists of patterns of beliefs and the intrinsic values they contain that inform action (Kroeber and Kluckhohn, 1952). Anthropologists Mead (1937) and Taylor (1871) add that laws, morals and customs combine in a complex whole of behaviours that usually determine how a society will act. These can impact on obtaining internet skills. For example, some countries' governments censor internet content considered permissive or blasphemous, some disallow people from using the internet due to gender, age and societal class or caste and do not believe that older people need to use the internet. Such beliefs and prejudices do hinder or prevent the teaching of internet skills. Teachers must be aware of what they can or cannot teach students.

Two studies suggest a digital divide occurs because of a country's cultural values. Johnson (2003) interviewed Malaysian female students, observing that their conservative beliefs hindered the teaching of internet skills. They felt fear and embarrassment at coming across inappropriate content as the concept of modesty is very strict in Malaysian culture. A second study was a large-scale survey undertaken in rural Pakistan. Abdullah (2015) found that despite a growing internet infrastructure being implemented, a divide between older and new caste members existed there. Newer caste members obtained internet skills, but the older caste members preferred using older technologies, such as landline telephones, and tried to impose established ways of using technology on newer caste members. Such cultural values can hinder the development of the teaching of internet skills to older people.

Table II shows the range and breadth of issues the sample of studies raised when understanding the problems of minimizing the digital divide. It is important to note that studies of older people experiencing the divide were low in finding; therefore, some of these studies use a general age sample in their studies.

Overall, the expected research findings on the issue of older people learning how to use the internet and ICT in developing countries show similar reasons for their lack of internet and ICT skills. However, there were additional reasons including cultural beliefs, educational levels, lack of infrastructure, poor literacy, war and civil unrest, disease and an unwillingness to see the advantages of learning such skills. Cultural beliefs do impact on older people seeking education compared to developed countries, where cultural attitudes towards internet content are more open and less of a barrier during teaching.

Educating older people in developing countries for internet skills does mean taking a different instructional approach to those in developed countries. Being mindful of the social situation the older person is in is crucial. The students need to be taught according to their needs which may be very different to those in developed countries. Older people prefer a more practical rather than formal lesson delivery style (van Deursen *et al.*, 2011). They also need it to be problem-solving focused (Stanberry and Azria-Evans, 2001) rather than the teaching of topics irrelevant for living their life.

Conclusions and recommendations

This review's conclusion is that minimizing the grey divide in developed and developing countries is linked to teaching internet skills to older people. However, while the literature presented results that demonstrated how to do this, clearly, there are many complex factors that hinder this process. It was expected that developing countries still present more problems for older people; yet, the literature does suggest cultural attitudes heavily influence if teaching of internet skills takes place. While less so in developing countries, minimizing the grey divide was consistently linked to the level of support and encouragement the older people obtained. Nevertheless, the value of the review lied in highlighting the many ways of teaching internet skills that can ensure success. The problem remains how to adopt them appropriately in developing or conservative countries so that older people can access training.

Convincing governments to fund internet skills is a major challenge, though the government research literature argues that clearly it is vital to skill older people for inclusion in a society. Although the intention is not to force older people to use the internet should they not wish to, offering skilling in an appropriate cultural and personal context is worthwhile and ethical. Information access is a major barrier to older people and their inclusion in society. They must have opportunities to learn to use the internet and be taught such skills regardless of their living circumstances. The research found for this review shows the many ways older people can learn to use the internet and ICT's. Therefore, if the grey digital divide is minimized by the types of learning styles and techniques then it needs to be further drawn upon by governments to see examples of practice that can achieve the aim of skilling older people.

Based on the literature reviewed, a major recommendation is that policy makers need to carefully take into account what works in teaching combined with the unique needs of the developed or developing country. This is not without substantial physical and ethical risks to researchers particularly in high-risk countries. Abdullah's (2015) study highlighted this problem, as the study was long and difficult, involving convincing people in tightly coupled caste systems to participate, while also facing personal safety issues in Pakistan. Yet, it yielded an effective understanding of why people are denied the teaching of internet skills due to prevailing cultural attitudes. Comparative studies in developed and developing countries also need to be undertaken to assess grey digital divides arising from less obvious causes. Furthermore, more reasons for not educating older people may be uncovered, especially as ICT becomes part of the lives of even the most remote developing countries.

This review demonstrated how older people in developed and developing countries are affected by a grey digital divide. Internet skills teaching was this review's subject because of the attention being paid to it as a digital divide minimizing strategy. Although clearly skills teaching is not a simple solution due to cultural and material access issues, the research does offer a large, rich body of solutions grounded in empirical and descriptive data that do show how to solve this problem. This paper has illuminated this key ethical issue that needs further attention; the hampering of the progress of older people worldwide in learning internet and ICT skills is important to address because the internet will further pervade the lives of people who while may currently be poor, will have increasing access to it and as such must possess the skills to use it wisely.

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Corresponding author
Michael Nycyk can be contacted at: michael.nycyk@gmail.com

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