Getting Contact to Elderly Associates Through the ICT: An Exploratory Study

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Abstract. Information and Communication Technologies - ICT has become a crucial element in the daily life of modern societies. Nevertheless, the elderly population does not follow the evolution of this new digitized world at the same pace. Thus, is necessary to ICT answer the digital demands of older adults. For this purpose, their literacy issues, physical limitations, and motivation have to be understood. This work presents an exploratory study into how the members of the association of former students of the commercial school of Braga – AAAEICBraga, interact with ICT, such as the use of mobile phones, smartphones, computers, and the Internet in order to improve the dissemination of activities. 14 answers to the questionnaire were obtained from participants aged over 60. The results showed that most of the respondents demonstrate a good competence regard to the use of ICT. This conclusion is a proof that the AAAEICBraga associates are prepared to be informed through social networks of the new association activities. These activities can improve the social contact between associates (and other people) and provide them a healthier and more active lifestyle.

Keywords: Digital divide · Older adults · ICT · technological literacy

1 Introduction

In recent years, the population has been facing remarkable technological advances and young people have easily followed them. However, the same does not apply to the elderly population. Although some of them have tried to adapt to new technologies, there is still an age-related digital divide, also called as "grey divide" [1, 2]. Many show resistance and prefer to keep the old-fashioned methods [3–5]. This can be related to several reasons, for instance, they think that do not have the abilities/literacy to use or lack interest and motivation to learn about novel Information and Communication Technologies – ICT [6–9]. In addition, it has been shown that manifold factors contribute to the digital divide such as education, monthly income, quality of life, technical interest, prior computer use, religion, marital status, and also friends and family [1, 10–12]. However, it is interesting

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to note that some authors have verified that, in terms of gender the differences in internet usage are not significant [1, 10]. Neves et al. [13] observed that education was related to the mobile phone, computer, and Internet usage of the elderly in Lisbon. Furthermore, the authors verified that although many of them use mobile phones, the use of computers and the internet is reduced. In another study [14], these authors investigated the social capital of a group of adults (18+) and verified that this decreased with age. Another issue that can thwart older adults to interact with ICT is the applications' layout, as explored by Czaja and co-workers [15]. Moreover, Morris et al. [9] have observed that many older people are unaware of the advantages that ICT can provide, and this has to be urgently overcome. Despite the many advantages of ICTs, these can play an important role in home-based healthcare [19]. Findings showed that attitudes towards technology use and smartphone utilization ability have significant effects on older adults' disposition to use those tools. It was also found that older adults with a higher education level and financial power were more prepared to use healthcare ICT at home [19].

On the other hand, Gascón et al. [16] evaluated the perception of the Catalonia elderly about the use of ICTs but with the same social, economic, and geographical background and observed that in general, they shared the same opinions and that complexity was not pointed out as the main problem.

In addition to the previous factors that can influence the interaction of older people with ICT, the results presented by Moore et al. [17] showed a negative correlation between computer literacy and increasing age. Thus, efforts have to be done to fight these differences and reduce digital exclusion based on age since ICTs play a vital role in social involvement, well-being, and education for the elderly [4]. For all these reasons, the creation and improvement of different user-friendly interaction methods are needed to answer the digital demands of elderly people [6, 16, 18].

In the present exploratory work, the members of the association of former students of the industrial and commercial school of Braga – AAAEICBraga, were surveyed to understand how they perceive the use of mobile phones, smartphones, computers, and the Internet. The AAAEICBraga emerged in 1975, at the centenary of the school. Since then, several members joined the association and today count with about 360 active members with an average age of over 60 years aged. Currently, the association informs its members about the planned activities using social media (Facebook), email, or in person at the association headquarters. However, many members do not have email or social media, so the only way they are aware of the activities is when they go to the association and see the flyers. In light of this, the present work aims to explore the technological literacy of AAAEICBraga members, mostly 3rd age (+60 years), to understand their opinion and openness regarding the new technologies and thus improve and implement more efficient methods of contact between the association and its members.

2 Methods and Data Source

As previously explained, the present work explores the technology literacy of the members of the association of former students of the industrial and commercial school of Braga – AAAEICBraga. More specifically it is intended to answer the following question: "Are the elderly AAAEICBraga members using mobile phones, smartphones, computers, and Internet?".

The data collection was done through a self-administered questionnaire (which is given directly to the respondents, without intermediaries, and the answers are marked by the respondents, avoiding any type of influence). Therefore, a pre-test of the questionnaire was carried out with five potential respondents in the target age group to detect doubts or omissions, and to assess the clarity and accessibility of the language, the coherence and understanding of the questions, and the suitability of the different options presented. Minor corrections were necessary and after its implementation, the design of the questionnaire was considered finished.

The final questionnaire had six parts of questions. The first part considered the characterization of the respondent, such as gender, age, and education level. From the second to the fifth part, respondents were questioned about cell phone use, smartphone use, computer use (fixed or portable), and internet use. The sixth part assesses the technological profile of each respondent.

Since the majority of the members of the association were retired, the team thought of easy ways for the inquiry process, considering the paper preference of this age group and those members with low levels of technological knowledge. Therefore, there were available two ways of answering the questionnaire:

- on paper (available to fill out in on the association's building);
- an online questionnaire, created through the *Google Forms* software.

The questionnaire was made available for response in the second half of July 2022 and members were invited to participate in the study through an announcement from the Association's Facebook webpage: https://www.facebook.com/AAAEICBraga/ and an email (those with email contact). A total of 17 answers were obtained from AAAE-ICBraga's members (8 of them were answered on paper and 9 online). This low response rate can be explained by the fact that the association's activities are on a summer break, with most of its members supporting their grandchildren on school holidays. Recognizing the advantage of using online questionnaires (it provides full databases convertible to Spreadsheets (Excel) and .csv files with all the respondents' answers), responses collected on paper were converted to online responses (including a note that they were originally collected on paper). After importing to SPSS, the database was edited and worked on in order to ensure adequate analysis of the answers (for example, in questions with several answer options, it was necessary to unfold each of the options in a new variable).

As the age of the respondents is a variable of interest in the present paper, the age distribution was studied, having identified 3 outliers with ages lower than 60 years (see Fig. 1).

Thus, it was decided to remove the responses of these outliers from the analysis, which resulted in a final sample of 14 valid elements. Results are presented through the next topic.

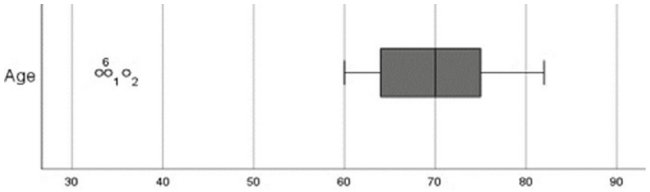

Fig. 1. Boxplot - Respondents' Ages.

3 Main Statistical Findings and Results

The characterization of respondents considered gender, age and education level. Respondents are equally represented in terms of gender, with 50% male and 50% female (see Table 1).

Table 1. Results – Respondents' Gender.

	Total	Male	Female
N	14	7	7
%	100.0%	50.0%	50.0%

Respondents' ages range between 60 and 82 years, with an average of 71.43 and a standard deviation of 6.235 years (Fig. 2).

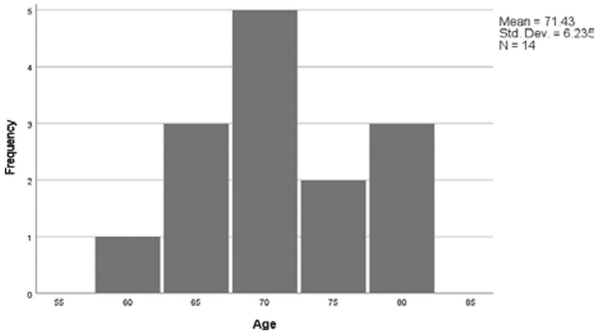

Fig. 2. Histogram of Respondents' Ages.

The education level was accessed through a direct question with the following options:

1. Preparatory education
2. Industrial education
3. Commercial Education

4. Female training course
5. High School
6. Industrial Institutes
7. Higher education
8. Other (please specify)

Following Anderberg, Eivazzadeh, and Berglund's study [21], each respondent was later classified into one of three levels of education:

(1) *Low* (those who did not finish secondary school);
(2) *Medium* (those who finish secondary school but no further education);
(3) *High* (those with some form of higher education) (Table 2).

Table 2. Results – Respondents' level of education.

	Total	Low	Medium	High
N	14	0	10	4
%	100.0%	0.0%	71.4%	28.6%

Table 3 presents the results for access to technology. All respondents have a cellphone and use the internet, 64.3% of them have a smartphone and 85.7% have a computer.

Table 3. Access to technology

	Total	Yes	No	Yes	No
Do you have a cellphone?	14	14	0	100.0%	0.0%
Do you have a smartphone?	14	9	5	64.3%	35.7%
Do you have a computer?	14	12	2	85.7%	14.3%
Do you use internet?	14	14	0	100.0%	0.0%

The next subsections present the type of usage and what are the perceived motivations or barriers in the use of each technology.

3.1 Cellphone Usage

The type of cellphone usage was accessed with two questions, one considering the reason for having a cell phone (5 options, including "other") and the frequency of use (4 options). As presented in Table 4, the main reasons to have a cell phone are "Talk to friends", "Being reachable when away from home" (both selected by 85.7% of respondents), and "Talk to family" (selected by 78.6% of respondents). The other option was mainly chosen to specify professional reasons (4 respondents).

The question "How often do you use your cell phone?" considered four possible options: (1) At least once a day; (2) At least once a week; (3) At least once a month; (4) Very rarely.

Table 4. Reasons for having a cell phone

The reasons for having a cell phone are: (you can choose more than one option)	Total	Selected option	Option not select	Selected option	Option not select
Talk to friends	14	12	2	85,7%	14,3%
Being reachable when away from home	14	12	2	85,7%	14,3%
Talk to family	14	11	3	78,6%	21,4%
Use in an emergency	14	9	5	64,3%	35,7%
Other (please specify)	14	7	7	50,0%	50,0%

All the respondents assumed using the cell phone "at least once a day" (100%).

3.2 Smartphone Usage

The type of smartphone usage was accessed with one question considering the reason for having a smartphone (7 options, including "other"). As presented in Table 5, the main reasons to have a smartphone are "Talk to family and friends", "Take photos", "Use apps like Whatsapp, Facebook,…" (each one selected by 88.9% of the respondents with a smartphone), and "Browse the internet" (selected by 77.8% of respondents). Only one respondent assumed using the smartphone to "play".

If the respondent did not have a smartphone, the questionnaire comprised a question regarding reasons for not having a smartphone (5 options, including "other"). The results are presented in Table 6. The main reason for not having one smartphone" is the option "No smartphone needed" (selected by 80.0% of the respondents with no smartphone).

Table 5. Reasons for having a smartphone.

The reasons for having a smartphone are: (you can choose more than one option)	Total	Selected option	Option not select	Selected option	Option not select
Talk to family and friends	9	8	1	88,9%	11,1%
Take photos	9	8	1	88,9%	11,1%
Use apps like Whatsapp, Facebook…	9	8	1	88,9%	11,1%
Browse the internet	9	7	2	77,8%	22,2%
Access online banking	9	6	3	66,7%	33,3%
Other (please specify)	9	2	7	22,2%	77,8%
Play	9	1	8	11,1%	88,9%

One respondent chose simultaneously the options "Doesn't know how to use a smartphone" and "Considers it expensive to have a smartphone". It is interesting to notice that no respondent considered to be too old to use a smartphone.

Table 6. Reasons for not having a smartphone.

If you don't have a smartphone, the reasons for not having a smartphone are: (you can choose more than one option)	Total	Selected option	Option not select	Selected option	Option not select
No smartphone needed	5	4	1	80,0%	20,0%
Doesn't know how to use a smartphone	5	1	4	20,0%	80,0%

(*continued*)

Table 6. (*continued*)

If you don't have a smartphone, the reasons for not having a smartphone are: (you can choose more than one option)	Total	Selected option	Option not select	Selected option	Option not select
Considers it expensive to have a smartphone	5	1	4	20,0%	80,0%
Considers to be too old to use a smartphone	5	0	5	0,0%	100,0%
Other (please specify)	5	0	5	0,0%	100,0%

3.3 Computer Usage (Fixed/Laptop Computer)

The type of computer usage was accessed with two questions regarding the reason for having a computer (8 options, including "other") and the frequency of use (4 options). All respondents with a computer selected as the main reason to have it "Use email" (100%). The other reasons presented in Table 7 are "Browse the internet" and "write texts" (both selected by 91.7% of respondents). The other option was mainly chosen to specify professional reasons (3 respondents). No respondent assumed to use the computer to "Play".

Table 7. Reasons for having a computer.

The reasons for having a computer are: (you can choose more than one option)	Total	Selected option	Option not select	Selected option	Option not select
Use email	12	12	0	100,0%	0,0%
Browse the internet	12	11	1	91,7%	8,3%

(*continued*)

Table 7. (*continued*)

The reasons for having a computer are: (you can choose more than one option)	Total	Selected option	Option not select	Selected option	Option not select
Write texts	12	11	1	91,7%	8,3%
Access online banking	12	9	3	75,0%	25,0%
Use Facebook, …	12	8	4	66,7%	33,3%
Save photo albums	12	7	5	58,3%	41,7%
Other (please specify)	12	3	9	25,0%	75,0%
Play	12	0	12	0,0%	100,0%

The question "How often do you use your computer?" considered four possible options (see Table 8). The majority of respondents answered, "at least once a day" (83.3%).

Table 8. Computer frequency of use.

How often do you use your computer?	N	%
At least once a day	10	83,3%
At least once a week	1	8,3%
Very rarely…	1	8,3%
At least once a month	0	0,0%
Total	12	100.0%

If the respondent did not have a computer, the questionnaire comprised a question regarding reasons for not having a computer (5 options, including "other"). Of the two respondents with no computer, one selected the option "No computer needed" (50.0%), and the other respondent chose the "other" option, specifying "I have a tablet". The results are presented in Table 9.

Table 9. Reasons for not having a computer.

If you don't have a computer, the reasons for not having a computer are: (you can choose more than one option)	Total	Selected option	Option not select	Selected option	Option not select
No computer needed	2	1	1	50,0%	50,0%
Other (please specify)	2	1	1	50,0%	50,0%
Doesn't know how to use a computer	2	0	2	0,0%	100,0%
Considers it expensive to have a computer	2	0	2	0,0%	100,0%
Considers to be too old to use a computer	2	0	2	0,0%	100,0%

3.4 Internet Usage

The type of internet usage was accessed with two questions regarding the frequency of use by day (3 options) and by week (4 options) and a third one to specify which online activities are performed. Considering the internet use frequency, the majority of respondents use the internet "Less than 2 hours a day" (92.9%), with the week frequency ranging from "More than 5 days a week" (42.9%) to "Less than 3 days a week" (35.7%) (see Table 10 and Table 11).

Table 10. Internet frequency of use by day.

How many hours per day do you use the internet? (choose only one of the options)	N	%
Less than 2 h a day	13	92.9%
Between 2 to 5 h a day	1	7.1%
More than 5 h a day	0	0.0%
Total	14	100.0%

Table 11. Internet frequency of use by week.

How many days per week do you use the internet? (choose only one of the options)	N	%
More than 5 days a week	6	42.9%
Less than 3 days a week	5	35.7%
Between 3 to 5 days a week	3	21.4%
Total	14	100.0%

Comprising the online activities, the questionnaire presented 7 possible activities, including the "other" option to specify. The respondents selected as their main online activities "Read the news" (71.4%), "Search for information on health topics" (50%), and "Chat online" (42.9%). The other option was mainly chosen to specify professional activities (2 respondents). Only two respondents assumed to use the computer to "Play" or "Shop online" (each option selected by one respondent only). Results are presented in Table 12.

Table 12. Online activities.

What activities do you usually do online? (you can choose more than one option)	Total	Selected option	Option not select	Selected option	Option not select
Read the news	14	10	4	71,4%	28,6%
Search for information on health topics	14	7	7	50,0%	50,0%
Chat online	14	6	8	42,9%	57,1%
Watch videos and listen to music	14	4	10	28,6%	71,4%
Other specify please	14	4	10	28,6%	71,4%
Play	14	1	13	7,1%	92,9%
Shop online	14	1	13	7,1%	92,9%

3.5 Technology Profile

The technology profile was accessed with two questions. The first question invites respondents to rate their technology competence: "*On a scale from 1 (minimum) to 10*

(maximum), how do you rate your competence when it comes to using a smartphone or a tablet?: _____(write the numerical value that best characterizes your competence)". Respondents' answers range from 3 to 10, with an average of 6.79 and a standard deviation of 1.718. Results are presented in Fig. 3.

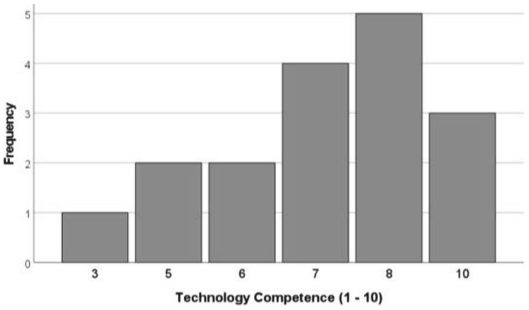

Fig. 3. Technology competence (self-assessment).

The second question was adapted to Portuguese from the TechPh scale developed by Anderberg, Eivazzadeh, and Berglund's study [21]. Each respondent selected the level of agreement with the following six statements (Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree):

1) I find the new technological devices fun
2) Using technology makes my life easier
3) I like to buy the latest models or updates
4) Sometimes I'm afraid of not being able to use the new technical things
5) Today, technological progress is so rapid that it's hard for me to keep up.
6) I would have dared to try new technical devices to a greater extent if I had more support and help than I have today.

The majority of respondents totally agree with "Using technology makes my life easier" (statement 2 with 85.7% of positive responses, that is, the sum of levels "agree" and "totally agree") and "I find the new technological devices fun" (statement 1, with 78.6% of positive responses). Respondents tend to disagree with "I would have dared to try new technical devices to a greater extent if I had more support and help than I have today" (statement 6 with 42.9% of negative responses, that is, the sum of levels "totally disagree" and "disagree"). Results are summarized in Table 13.

Table 13. Level of agreement with the TechPH statements.

How much do you agree with the following statements (scale from 1 (strongly disagree) to 5 (strongly agree): (for each statement, choose only one agreement option)	Totally disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Totally agree (5)	Positive answers
1. I find the new technological devices fun	0,0%	7,1%	14,3%	64,3%	14,3%	78,6%
2. Using technology makes my life easier	0,0%	7,1%	7,1%	57,1%	28,6%	85,7%
3. I like to buy the latest models or up-dates	7,1%	7,1%	42,9%	35,7%	7,1%	42,9%
4. Sometimes I'm afraid of not being able to use the new technical things	14,3%	21,4%	35,7%	21,4%	7,1%	28,6%
5. Today, technological progress is so rapid that it's hard for me to keep up	0,0%	35,7%	35,7%	14,3%	14,3%	28,6%

(*continued*)

Table 13. (*continued*)

How much do you agree with the following statements (scale from 1 (strongly disagree) to 5 (strongly agree): (for each statement, choose only one agreement option)	Totally disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Totally agree (5)	Positive answers
6. I would have dared to try new technical devices to a greater extent if I had more support and help than I have today	14,3%	28,6%	21,4%	21,4%	14,3%	35,7%

4 Discussion and Conclusion

In the present study, the adoption of new ICT by the AAAEICBraga members was explorated to understand their willingness and accessibility to use these tools. When compared to younger adults, older adults have a certain resistance that is related to several factors namely functional, attitudinal, and physical. As a consequence, some of them suffer from social exclusion that in a long term can negatively affect the wellbeing and social participation of the elderly in some activities.

Despite the fact of being a small sample, it was interesting to observed that the majority of respondents show a great level of use of the new technologies, contrary to the association´s perceptions and some society stereotypes. All respondents have cell phones and uses the internet. Also, the results show that most of them use their phone almost every day, at least 1 hour per day, access the computer at least once a week, and surf the internet 5 days per week. The answers suggest that ICT contributes with great benefits to their lives, like being contactable with family and friends, searching for useful information online, and using applications as *Facebook* and *WhatsApp.*

These results are a positive indicator that the AAEIC members has some familiarity with technologies. Are they prepared to be informed of the new association activities through social networks? If, by expanding the study to a more expressive sample, this predisposition is confirmed, this accessibility to ICT from the members can be a huge opportunity for AAAEICBraga to promore with more success their activities, reaching more members to have a healthier and more active lifestyle, to avoid isolation and social exclusion, contributing to the wellbeing of the elderly.

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