OTHER THEMES

Digital Literacy for Older Adults: perceptions about teaching-learning

Karina de Lima Flauzino[I]
Maria da Graça Campos Pimentel[I]
Samila Sathler Tavares Batistoni[I]
Isabela Zaine[I]
Lilian Ourém Batista Vieira[I]
Kamila Rios da Hora Rodrigues[I]
Meire Cachioni[I]

[I]Universidade de São Paulo (USP), São Paulo/SP – Brazil

ABSTRACT – Digital Literacy for Older Adults: perceptions about teaching-learning. Digital literacy programmes for the elderly propose to expand digital skills and competences; yet, knowledge about the methodological and teaching approaches in these interventions is scarce. The study aimed to verify the optimising factors in the teaching-learning process in digital literacy programmes for older adults, based on students' perceptions. Using the content analysis technique, two main categories were identified among the contributions of 278 participants. It was concluded that the human aspects should be valued by the instructors in the teaching-learning process for older-adult students, mainly, by demonstrating the qualities of being patient, calm and attentive.
Keywords: **Digital Literacy. Older Adults. Teaching-Learning.**

RESUMO – Letramento Digital para Idosos: percepções sobre o ensino-aprendizagem. Os programas de letramento digital para idosos propõem ampliar as habilidades e competências digitais, porém os conhecimentos sobre as abordagens metodológicas e de ensino nestas intervenções são escassos. O estudo objetivou verificar os fatores otimizadores no processo de ensino-aprendizagem em programas de letramento digital para idosos, a partir das percepções de alunos. Utilizando-se a técnica de análise de conteúdo, duas categorias principais foram identificadas entre as emissões de 278 participantes. Conclui-se que os aspectos humanos devem ser valorizados pelos instrutores no processo de ensino-aprendizagem para alunos idosos, principalmente, demonstrar as qualidades de ser paciente, calmo e atencioso.
Palavras-chave: **Letramento Digital. Idosos. Ensino-Aprendizagem.**

Introduction

The worldwide access to the internet has stimulated the creation of online solutions targeting several life domains, with the potential to improve people's health, as well as their cognitive, social and emotional wellbeing. Recent studies demonstrate that the use of information and communications technology (ICT), such as computers, tablets and smartphones, indicates improvements in subjective wellbeing among the elderly (Nimrod, 2019); promotes social engagement and diminishes loneliness when connected to online activities (Szabo; Allen; Stephens; Alpass, 2019); and contributes to the development of motor skills, perceptive/cognitive and affective/motivational as a result of playing digital games (Wang; Hou; Tsai, 2020).

An increase in internet use by older people has been observed over time (Hunsaker and Hargittai, 2018), yet this age group still has unequal access to ICT when compared to younger generations, resulting in a digital gap. Gil (2019) observes that young people born into an environment of technology and digital resources are deemed digital natives, while, on the other hand, those who have adapted or seek to adapt themselves to the new technological reality are digital immigrants.

For older people to enjoy the benefits of technology more broadly, their exposure to digital devices should progress to a critical analysis of the available content. Silva and Behar (2019) highlight the main differences among the terms alphabetism[1] (to be understood as a pre-stage of literacy, that is, basic literacy as opposed to full-fledged literacy), literacy, fluency and digital competence since, although interconnected, these terms present a conceptual evolution. According to the authors, digital alphabetism refers to acquiring the skills to interpret and comprehend codes and language, that is, it is concerned with the first stage of the individual's experience and practice (mastering writing skills and reading comprehension) within the digital context. This means that alphabetisation differs from digital literacy, which consists of the ability to use and comprehend information of various formats and sources, including the appropriation of the new technology and the practice of reading and writing on the screen. Therefore, a level rise is identified since the latter incorporates the shared cultural and social notion of the functionalities of technologies in the knowledge society.

Digital fluency, in turn, relates to the progress in the ease of utilising technologies, equipping the individual with the ability to evaluate, select, learn and express themselves digitally according to their personal or professional preferences. In this sense, the digitally fluent individual exercise their creativity while producing and generating new knowledge, rather than only comprehending it. Finally, the wide concept of digital competence expresses the various elements necessary for the use of ICT, such as knowledge, the skills and the attitudes towards it. In other words, "what is expected from someone digitally competent is that they can sufficiently comprehend the technological means so to utilise the information, be critical and be able to communicate using a variety of tools[2]" (Silva; Behar, 2019, p. 26).

The development of the technical and operational skills aligned to the ability to understand technological information could contribute to reducing the digital gap. However, it is acknowledged that the adoption of technology by the elderly is a complex theme, as it encompasses multiple affective and psychosocial aspects which may, or may not, facilitate the use of technologies (Vroman; Arthanat; Lysack, 2015). Gil (2015) argues the need to expand digital competences for the older adult by means of educational programmes focused on the development of technical and methodological strategies.

The emerging field of education for older people requires more detailed investigation, both from an epistemological point of view and methodological approaches (Kern, 2018). Doll (2016) observes the shortage of educational theories targeting debates about older adults' learning. Still, the recognition of their learning capacity has prompted reflexions about teaching practice so pedagogical proposals are consistent for the current and future generations of older people.

Aiming to investigate the pedagogical strategies employed in a programme of permanent education for older people, Cachioni, Ordonez, Batistoni and Lima-Silva's (2015) study shows that a participative and problem-solving pedagogy - in which the content is appropriate to the older age-group - contributes to learning. Within the technological learning context, Tan (2018) recommends the prioritisation of student's needs rather than focusing on the activities through technocentric lenses, that is, the teaching starts with the students' needs for the relevant technology rather than concentrating on fitting the technology to the students' purposes. Furthermore, the author stresses the necessary alignment between the organisation of the programmes and the appropriate theories for the elderly.

For a better understanding of teaching-learning, Jarvis (2006) explains the difference between teaching methods and learning style, the first being related to the variety of techniques and procedures which may be applied to teaching by means of mutual sharing of knowledge between the instructor/teacher and the adult student, while style refers to the "manner of expression", or the teachers' "art of teaching" (p.30). The expression "art of teaching" derives from the principles and definition of the didactics proposed by John Amos Comenius (lat.). In the publication Didactica Magna (lat.) of 1657, where Comenius states that "didactics signifies the art of teaching" (Comenius, 1967, p. 5), when defending a universal, humanist education available to all.

According to Jarvis (2006), there is an overlap between method and style of teaching, as the one teacher directs the learning. However, distinct characteristics between the two terms can be identified; for instance, teachers may be "authoritarian facilitators" or "democratic facilitators", and may be involved in "democratic didactics" or "authoritarian didacticism" (p. 35). As the author notes, teaching encompasses other perspectives beyond technique and methods, also involving manners of experiencing the teacher-student interaction.

Some research has demonstrated the main methodological approaches employed in non-formal learning programmes for older people from the point of view of the instructors and mentors (Cachioni et al., 2015; LoBuono; Leedahl; Maiocco, 2020). The aim of this study is to focus on the older students' perceptions so to identify the optimising factors in the teaching-learning process in a digital literacy programme for older learners. The target audience's input regarding the teaching approaches contributes to the development of learning resources more appropriate to older adults.

Methodology

This exploratory and descriptive study is part of a major project titled "Digital literacy and remote scheduled intervention for the elderly by means of mobile devices", which has been developed by the School of Arts, Sciences and Humanities (EACH), University of São Paulo (USP), in partnership with the Institute of Scientific Mathematics and Computation of São Carlos (ICMC). The project was approved by the EACH Research and Ethics Committee. During 2018 and 2019, an educational intervention in digital literacy for older people was implemented in workshop format in the setting of the USP 60+ programme.

Research protocols applied included pre- and post-testing in addition to testing during the educational activity over the four academic semesters of the workshop, and involved informing the participants about the research aims and objectives, about their freedom to withdraw at any time, and their signing a consent form. The present study focuses on the analysis of the pre-test perceptions of the older adults regarding the digital literacy activity and proposes a discussion in the domain of the teaching-learning process. The chronological age of sixty years was adopted as a defining criterion for the older person, according to current Brazilian legislation (Law n. 10.741, 2003).

The sample for the study consists of 317 older students enrolled in the university's outreach programme, USP 60+. The research method adopted was the interview and the data collection instruments were pen and paper. For the purposes of preserving the participant's identity, the respondents were identified with codes representing each thematic category.

The information gathered from a sociodemographic and economic questionnaire administered at the start of the research project indicated the general characteristics of the sample. The majority of the participants comprised females (59,3%), within an age-range of 65 to 69 (32,5%), having twelve or more years of education – expressed by the total number of years in the formal education (40,7%), with average income of four or more minimum salaries (32,8%), married (44,2%), and living with relatives, friends or nonfamily members (64%).

On the first day of the digital literacy workshop, before beginning the thirty-hour scheduled workload, the enrolled older students were

invited to freely answer the following open question: "What suggestions would you give to the person who teaches the elderly how to use smartphones and tablets?". The interviewer recorded each student's oral answer offered verbatim.

The choice of an open question format was due to its potential to obtain diverse spontaneous thoughts and opinions from the participants. According to Fachin (2017), the application of open questions allows for the detection of opinions, attitudes, motivation and meanings in relation to the theme under investigation, offering the researcher answers with proper language, free from limitations or deliberations.

All of the participants' answers were digitised and organised in the IBM-SPSS system (software utilised in the main project). Collected data was subjected to qualitative content analysis in order to categorise the participants' answers for the study. According to Bardin (2016), the thematic categorical analysis must follow three main phases comprised of important steps for explicitness, systematisation and expression of the content of the messages: pre-analysis, material exploration and treatment of the results, inference and interpretation.

In this sense, the pre-analysis of the study consisted in the organisation of all the collected material in order to systematise the content in an exhaustive, representative manner, paying special attention to the homogeneity of the data and its pertinence to the study. To do so, the first contact with the collected documents entailed a skim-reading, as is recommended for the development of the technique. Subsequently, the identified material was explored for the registration units and the contextual units.

The following step was to define the thematic axes (for instance, the answers "be patient" and "have much patience" were coded under the same theme of "patience"). The numbering order was based on simple frequency – the number of occurrences of the analysed units – and on a measurement of cooccurrence, considering the distribution of the elements when there was a simultaneous presence of two or more registration units. The thematic axes were then divided into two categories: a) personal qualities and b) Didactics and methodological techniques. Finally, the reflective action supported the processes of inference and interpretation, being discussed with regard to the theoretical framework proposed by Jarvis (2006).

A word cloud – graphic image which identifies the relevance of words based on their frequency - was generated so to represent the category "personal qualities", in order to obtain a comparative visualisation among the words expressed in the participants' answers. By doing so, the answers from this category were coded and converted into contextual units.

Results

The results present the perceptions of the older students regarding the teaching-learning process in digital literacy programmes tar-

geting this group age. In total, 278 answers (88%) were analysed out of the 317 participants' contributions in the study; 39 of them (12%) were excluded due to the absence of suggestions made by the older students (for instance, "I have no suggestions" (A-5)) or the absence of answer. Table 1 represents the two categories analysed in the study, their respective definitions, the corresponding thematic axes and examples of the participants' contributions. It is important to note that some of the contributions presented as examples can fall into more than one category.

Table 1 – Categories under analysis, definitions, thematic axes and participants' contributions. São Paulo, 2020

Categories Analysed	Category Definition	Thematic Axes and Participants' Contributions
1) Personal qualities (Code: CA)	Refers to participants' contributions regarding the desirable personal qualities and attributes for the instructors/mentors.	**a) Patience (P)** CAP23: *"Have much patience"* CAP54: *"Patience with the students"* **b) Personal Attributes (A)** CAA256: *"Much calmness"* CAA262: *"Not to have arrogant attitude and treat people as they would like to be treated"*
2) Didactics and methodological strategies (Code: DE)	Refers to the participants' contributions regarding the didactics, techniques and methods applied to the teaching-learning process.	**a) Supporting autonomy (F)** DEF266: *"Teach and not to do [the activity] for me"* DEF08: *"Teach and let me do it by myself"* **b) Attention to sensorial deficits (A)** DEA42: *"Patience and understanding of the difficulties each one faces"* DEA34: *"Improve the booklets, specially enlarging the fonts"* DEA91: *"Be patient and review content so we don't forget what we have learnt"* **c) Focus on practical actions (P)** DEP41: *"Focus on day-to-day and internet things, how to instal apps"* DEP92: *"To have loads of practical activities"* **d) Didactics (D)** DED58: *"Try to show that it is not rocket science, that we should not be afraid"* DED115: *"Speak in a simple way, providing the content in simple language"*

Source: Developed by the authors based on the com Digital Literacy Programme for the older learner EACH/ICMC 2018/2019.

When considering the sociodemographic and economic characteristics of the participants, those who suggested "personal qualities" were mostly women (74%), in the age range 60 to 69 (65%) and who had

completed higher education (26%). Regarding the category of "didactics and methodological strategies", half the respondents who suggested "to focus on practical actions" had ten or more years of education and household incomes higher than three minimum salaries; from those who recommended "attention to sensorial deficits", 59% were between 60 and 69 years old.

Table 2 presents the distribution of frequency among the categories and their respective thematic axes. It is important to highlight that the total sum exceeds the total number of analysed answers as 38 contributions (13%) fall into both categories; likewise, the thematic axes of category 1 showed cooccurrence of 27 contributions (13%).

Table 2 – Frequency distribution of the categories and their corresponding thematic axes. São Paulo, 2020

Categories and Thematic Axis	Categories N (%)	Themes N (%)
1. Personal qualities	203 (64)	-
1.1 Patience	-	184 (90)
1.2 Personal Attributes	-	54 (26)
2. Didactics and methodological strategies	113 (36)	-
2.1 Supporting autonomy	-	10 (9)
2.2 Attention to sensorial deficits	-	39 (34)
2.3 Focus on practical actions	-	14 (12)
2.4 Didactics	-	50 (44)
Total	**316 (113)**	**-**

Source: Developed by the author based on the Digital Literacy Programme for the older learner EACH/ICMC 2018/2019.

Within the category "personal qualities", the word "patience" stood out as a registration unit and as a contextual unit, thus being allocated to a thematic axis of its own. Figure 1 represents this category in form of a word cloud, allowing for identification of 21 different qualities. The larger the word, the higher its frequency in the answers.

Figure 1 – Word cloud of the category "personal qualities". São Paulo, 2020

Source: compiled by the authors[3] based on the Digital Literacy Programme for the older learner EACH/ICMC 2018/2019.

The specific quality of being patient was the most reported suggestion by the participants, although other qualities were suggested by the older students, such as attention, calmness, understanding, tranquillity and kindness. It is notable that the word "Patience" (CAP122) alone occurred in 72 answers (40%) and the contributions of "Have much patience" (CAP145), "Have loads of patience" (CAP40) and "Much patience" (CAP183) appeared in 24 answers (13%).

Regarding the cooccurrence measurement among the categories, it was verified that 13% (38 contributions) of the total sample of participants proposed to the instructors "personal qualities" aligned to "didactics and methodological strategies" for the teaching of the elderly. In addition to the suggestion of being patient, the respondents recommended more attention to their difficulties (52%), especially by means of repetition (18%) as a teaching strategy. Furthermore, it was observed that the quality of being patient was mentioned along with other personal attributes (13%), calmness and attention being the most frequent ones.

Discussion

The study explored aspects involved in the teaching-learning process in a digital literacy programme from the perspective of the older students themselves. The results confirm the pluralist essence and the interdisciplinary character which is inherent to the field of older-adult education (Fejes; Nylander, 2019), since they evidence themes related to personal and professional qualities and abilities of instructors, to the methodological strategies of teaching and to the favourable conditions for the student learning in the educational context of digital literacy.

The participants' characteristics in this study corroborate the results found by Vroman et al. (2015); the authors identified that older students in the lower age bracket, between 65 and 70 years old, holding higher level education and living with spouse or partner, were more likely to make use of technologies. Considering education and income

as the main predictive variables influencing the access to internet by the elderly (Fang et al., 2019), most of the older students enrolled in the digital literacy programme, the subject of this study, presented higher educational level and a household income greater than three minimum salaries.

In general terms, the participants' contributions confirm the evidence presented in LoBuono et al. (2020) research. The authors investigated facilitating practices in the digital literacy teaching for the older learners, though from the perspective of mentors and teachers: verbal and written instructions in a clear manner, use of simplified materials, explanation of technological symbols, review sessions and continuous repetition, and practical experience with the technologies. However, the older students' contributions in the current study reveal other additional factors involved in the practice of teaching, especially in relation to the instructors' personal attributes.

Personal qualities

Personal qualities, especially that of being patient, calm and considerate, were recognised as the most appropriate attributes for instructors in digital literacy programmes for the older learner. Patience stood out in this study, being sometimes linked to the instructor's teaching practice, and at others being presented as necessary to guide the older students towards overcoming learning problems or memory difficulties.

Based on these results, it is possible to reflect on the older students' self-perception with regards to learning. The suggested quality of instructors' being patient may refer to the internalisation of some expressions by the students, such as "older students do not learn" or "the elderly have difficulties with learning". Palmore (2015) considers *ageism* – negative stereotypes about aging – as a "social disease" (p. 874), which crosses people and generations. As a matter of fact, it is even possible to observe prejudiced attitudes among the elderly by associating old age with incapacity or disease.

The use of third-person plural was observed in some of the participants' contributions in this research, such as "*[I would like the instructor] to teach in detail, a little bit of patience because we are slow to learn*" (DEA/CAP 248) and "*Sometimes, poor things, they explain, explain and we still don't get it*" (DEA70). Therefore, it is possible to observe that the older students generalise the learning difficulties to all older people, who, in turn, have assumed that patience would be fundamental to those who teach the age group.

From Jarvis' theoretical perspective, within learning contexts, the older students evoke their interpretative and emotional memories from previous experiences. Two types of memories considerably affect the teaching-learning process: the explicit memories (experiences lived in a conscious manner, such as those shaped by formal knowledge) and

the implicit memories (perceptions of an event or situation which were unconsciously internalised, e.g. affective reaction, values and personal attitudes towards daily life) (Jarvis, 2015).

The results also demonstrate that the personality and humanity of those who teach have merged with teaching practice, which is attested to the recommendations mentioned by the older students on the profiles of instructors: "patient instructor", "calm observers" and "considerate, attentive-to-detail [teachers]". As it is presented by Jarvis (2006), the act of teaching is considered an intentional activity in which learning opportunities are offered and grounded in a considerate human interaction. Therefore, it involves a broader perspective than simply methodological and technical approaches, since it also includes the educator's charismatic profile. The author reports that the focus on content, techniques and methods most often obscures the moral foundation of teaching, that which encompasses the human elements present in the teacher-student interaction.

Teaching style is scantly mentioned in teaching education programmes, although it is as important as the methods of teaching. Teachers' performance – teaching style, the "art of teaching" (Jarvis, 2006, p. 24) – should be considered as a constituent part of the teaching-learning process, insomuch as it has a likewise influence on the teaching practice and the students' motivation for learning.

From the instructors and mentors' viewpoint, the quality of being patient was also observed in the results of research conducted by Arthanat, Vroman, Lysack and Grizzetti (2018), who recognised that mutual trust, patience and simplicity in the teaching of technology are the principal facilitating conditions noted by those who offer training for the older learner. The literature has demonstrated that affective and psychosocial aspects also have an influence on the adoption of technology by the elderly (Vroman et al., 2015; Lai, 2018), the condition of social support being one important predictor in this process (Tsai; Shillair; Cotton, 2017; Schreurs; Quan-Haase; Martin, 2017).

The twenty-one desirable personal attributes for instructors identified in this study confirm the importance of affective and social aspects in the adoption of technologies by the elderly. Gil (2019) underlines the fact that both the factors which lead to the adoption of technologies (use versus non-use) and the aspects regarding engagement and digital skills (digital literacy programmes, the accessible design of technologies, social and cultural conditions, among others) are part of the debate on the digital inclusion of digital immigrants – the elderly.

For the purposes of understanding the thematic of the use of technologies by older users, Arthanat et al. (2018) proposed a training model in ICT which is organised in levels, taking into consideration personal factors, previous experiences, social context and demographic aspects of those older users who adopt ICT. The model identified the main barriers and supports in the progressive adoption of ICT by the older learner, pointing to the fact that the instructors' good practices – such as the

offering of motivating activities and a relationship based on trust and patience between the instructors and the elderly – contribute to the sustainable use and self-exploitation of technologies, sense of autonomy, and competence in each stage of ICT adoption. Therefore, the effectiveness of digital literacy interventions for the older person requires a deeper understanding of the multidimensional aspects in the teaching-learning process.

Didactics and methodological strategies

Different recommendations were offered by the students with regards to didactics and methodological strategies. Clear and accessible communication, as well as the professional competences of teaching, mastering the knowledge and explaining the content were the suggestions to the instructors, which demonstrates the older students' concern with the teaching practice.

The suggestion of an attentive attitude by the instructors so they can identify the main necessities and difficulties of the students throughout the teaching process reinforces the importance of instructors adopting behaviours that are perceptive and adapted to older students' learning pace (Arthanat et al., 2018). The accessible and flexible teaching practice is present among the principal recommendations for the development of a learning programme for the older learners with a focus on technology (Tyler; De George-Walker; Simic, 2020). According to Boulton-Lewis and Tam (2018), the teachers' and instructors' flexible teaching practices contribute to guiding the older students in their choices and priorities within the learning process.

Considering the heterogeneous character of the older age group, especially within a digital context (Quan-Haase et al., 2018), studies recommend the combination of several teaching approaches enabling the elderly's adoption and use of technologies, such as observational learning, collaborative learning, providing step-by-step explanations and allowing learning by trial and error (LoBuono et al., 2020). This study confirms such recommendations, since it has evidenced a necessary alignment between techniques and methods to be adopted by the instructors with the older students' specific demands.

The thematic axis "attention to sensorial deficits" was comprised of the contributions identifying and understanding the students' difficulties in the learning process; the suitability of the teaching material or the educational activities; and the use of the strategy of content repetition by the instructors/mentors. For some older students, the justification for repetition or content review was ascribed to difficulties memorising or learning, as observed in: "*Older people tend to lose their ability to remember, so it is always important to revise*" (DEA72). In the Delello and McWhorter's (2017) study, while facing the same difficulties – memory and learning – the elderly suggested longer study time, practical activities with technology and the use of visual resources for the tasks. It is most often considered that is the teaching techniques that

are in need of modification in order to meet the older students' needs, not the content itself (Boulton-Lewis; Tam, 2018).

The participants' suggestion "focus on practical actions" refers to the acquisition of relevant and useful knowledge which is applicable to daily life. The contributions suggested activities to handle technology, for instance, how to configure a smartphone, install apps, download pictures, access the internet and shop online; in addition, practical in-class demonstrations with tips and step-by-step description of the actions. The recognition of the usefulness of technological resources is considered an important factor in the adoption and use of technology by the older people (Lee; Coughlin, 2015; Vroman et al., 2015). Older students' previous suggestions allow for better planning of the content to be offered in digital literacy programmes so to avoid technocentric approaches during the teaching (Tan, 2018).

Another theme evidenced in the results was the preservation of the students' autonomy during the learning process, in which two conditions were identified: not to do it for the older learners and to allow them to interact by themselves with the technologies, without the instructors' interference in the practical activities. The participants' comments regarding their preferences and learning objectives should be recognised in the digital literacy programmes (Tyler et al., 2020; LoBuono et al., 2020). In this sense, the goal is to promote the students' development of self-responsibility in the learning process and their appreciation of knowledge empowerment (Boulton-Lewis; Tam, 2018)

In the light of all recommendations offered by the older students to instructors of digital literacy programmes, it is possible to prove the complexity of the theme of teaching, and of the adoption and use of technology by the older users, inasmuch as various aspects are involved in these processes (Doll; Machado; Cachioni, 2016). Different theoretical models seek to understand the factors involved in the adoption of technology, such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), the latter being a broader model since it includes new variables associated with the social, affective and emotional contexts regarding the acceptance and use of technologies (Gil, 2019).

However, few studies focus their investigations on the teaching-learning process (Alvarenga; Yassuda; Cachioni, 2019). In fact, it can be argued that the construction of a theoretical framework for the education of the older person is incipient. Kern (2018) performed a mapping which revealed various epistemological approaches in the literature of education for the older people – educational gerontology, gerogogy, critical gerogogy, geragogy, gerontagogy, permanent education – which demonstrates the pluralist character of the theme.

It is important to note that the participants in this study comprise a sample of a specific educational intervention in a university outreach context, which limits the generalisations of the results to other groups of older students from different digital literacy circumstances. The in-

struments adopted for the data collection, as well as the choice for the analytical technique based on inference, also pose some limitations. Subsequent investigations on the theme are recommended, broadening the sample size and including other subgroups in the analysis which are also involved in the educational intervention, such as the instructors/mentors.

Conclusion

The current study has directed its investigation to the process of teaching and learning in digital literacy programmes for older adults. According to the participants, it is desirable that those who teach older learners how to utilise technology present a set of skills, behaviours and personal and professional attributes, which highlight the human aspects involved in the learning process.

For the older students, the main recommendations to the instructors/mentors in digital literacy programmes are: a) to possess, especially, the qualities of being patient, calm and considerate; b) to master the knowledge of technologies and teaching methods; c) to identify the older students' sensorial deficits so to adapt the educational inputs; d) to plan activities which target useful practices of technology use in daily life; and e) to support the older student's autonomy during the learning process.

The study reinforces the need for further detailed investigation on the teaching conditions for the elderly and highlights the relevance of training the instructors and mentors who work in technology learning programmes for this target audience. Overcoming the digital gap among different generations, and indeed within this very age group segment, involves the understanding of factors which play a role in the adoption and use of technologies by the older person, as well as the offering of digital literacy programmes which are concerned with the didactic organisation and the teaching style targeting this age group.

The "art of teaching" and the human aspects in the teacher-student interaction should be more valued in the teaching-learning process, being included in the training inputs offered to the instructors/mentors who teach older students. Furthermore, it is important to highlight the importance of content regarding the aging process and older age for the purposes of raising awareness and reducing the negative stereotypes towards older people. Ageism affects most people in several regions worldwide (Palmore, 2015), thus the elderly may internalise in a conscious or unconscious manner the social attitudes and behaviour which discriminate against them.

Technology is more and more present in various contexts across society and demands greater adaptations be made by those considered to be digital immigrants (Gil, 2019). It is expected that the efficiency of digital literacy programmes for older adults contribute to the digital inclusion, as well as to the social inclusion of the older in the digital era (Neves, 2018; Schehl, 2020)[4].

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Notes

1 In Brazilian Portuguese, *alfabetização* and *letramento* are two stages of literacy. The first simply refers to the learning of writing and reading, while the second refers not only to reading and writing, but also to social demands of such skills.

2 Our translation to: "o que se espera de um sujeito digitalmente competente é que este possa compreender os meios tecnológicos o suficiente para utilizar as informações, ser crítico e ser capaz de se comunicar utilizando uma variedade de ferramentas."

3 Construction of the word cloud based on the contextual units analysed, by means of https://www.wordclouds.com.

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References

ALVARENGA, Glaucia.; YASSUDA, Mônica.; CACHIONI, Meire. Digital Inclusion With Tablets Between Elderly: Methodology and Cognitive Impact. **Psicologia, Saúde & Doença**, v. 20, n. 2, p. 384-401, 2019.

ARTHANAT, Sajay. et al. Multi-stakeholder perspectives on information communication technology training for older adults: implications for teaching and learning. **Disability and Rehabilitation: Assistive Technology**, v. 14, n. 5, p. 453-461, jul. 2018.

BARDIN, Laurence. **Análise do Conteúdo:** edição revista e ampliada. São Paulo: Edições 70, 2016.

BOULTON-LEWIS, Gillian. M.; TAM, Maureen.Issues in Teaching and Learning for Older Adults in Hong Kong and Australia. **Educational Gerontology**, v. 44, n. 10, p. 639-647, 2018.

BRASIL. Lei nº 10.741, de 1º de outubro de 2003. Dispõe sobre o Estatuto do Idoso e dá outras providências**.** D**iário Oficial** [**da República Federativa do Brasil**], Brasília, DF, 03 out. 2003. seção 1. Retrieved from: <http://www.planalto.gov.br/ccivil_03/leis/2003/l10.741.htm>. Accessed on: 10 mar. 2020.

CACHIONI, Meire et al. Metodologias e Estratégias Pedagógicas utilizadas por Educadores de uma Universidade Aberta à Terceira Idade. **Educação & Realidade**, Porto Alegre, v. 40, n. 1, p. 81-103, 2015.

COMENIUS, John A. **The great didactic of John Amos Comenius**. Translated into english and edited with biographical, historical and critical introductions: M.W.Keatinge. New York: Russell & Russell, 1967. Retrieved from: <https://monoskop.org/images/7/7e/Comenius_John_Amos_The_Great_Didactic_1967.pdf>. Accessed on: 07 oct. 2020.

COMENIUS, John A. **Didáctica Magna**. Introdução, notas e tradução: Joaquim Ferreira Gomes. Lisboa: Fundação Caloutre Gulbenkian, 2001. Disponível em:

<http://www.ebooksbrasil.org/adobeebook/didaticamagna.pdf>. Acesso em: 07 out. 2020.

DELELLO, Julie A.; MCWHORTER, Rochell R. Reducing the Digital Divide: Connecting Older Adults to iPad Technology. **Journal of Applied Gerontology**, v. 36, n. 1, p. 3-28, 2017.

DOLL, Johannes; MACHADO, Letícia R.; CACHIONI, Meire. O idoso e as novas tecnologias. In: FREITAS, Elizabete V.; PY, Ligia (Ed.). **Tratado de geriatria e gerontologia**. 4. ed. Rio de Janeiro: Guanabara Koogan, 2016. P. 3585-3603.

DOLL, Johannes. A educação no processo de envelhecimento. In: FREITAS, Elizabete V. PY, Ligia (Ed.). **Tratado de geriatria e gerontologia**. 4 ed. Rio de Janeiro: Guanabara Koogan, 2016. P. 3554-3566.

FACHIN, Odilia. **Fundamentos de metodologia**: noções básicas de pesquisa científica. São Paulo: Saraiva, 2017.

FANG, Mei L. et al. Exploring Privilege in the Digital Divide: Implications for Theory, Policy, and Practice. **Gerontologist**, v. 59, n. 1, p. E1-E15, 2019.

FEJES, A.; NYLANDER, E. Introduction: Mapping the Research Field on Adult Education and Learning. In: FEJES, A.; NYLANDER, E. (Ed.). **Mapping out the research field of adult education and learning**. Switzerland: Springer, 2019. P. 3-14.

GIL, Henrique. Educação gerontológica na contemporaneidade: a gerontagogia, as universidades de terceira idade e os nativos digitais. **Revista Brasileira de Ciências do Envelhecimento Humano**, Passo Fundo, v. 12, n. 3, p. 212-233, 2015.

GIL, Henrique. The elderly and the digital inclusion: A brief reference to the initiatives of the European union and Portugal. **MOJ Gerontology & Geriatrics**, v. 4, n. 6, p. 213-221, 2019.

HUNSAKER, Amanda; HARGITTAI, Eszter. A review of Internet use among older adults. **New Media and Society**, v. 20, n. 10, p. 3937-3954, 2018.

JARVIS, Peter. Teaching styles and teaching methods. In: JARVIS, Peter (Ed.). **The Theory and Practice of Teaching**. 2. ed. Reino Unido: Routledge, 2006. P. 28-38.

JARVIS, Peter. Human Learning: implicit and explicit. **Educação & Realidade**, Porto Alegre, v. 40, n. 3, p. 809-825, set. 2015.

KERN, Dominique. Research on Epistemological Models of Older Adult Education: The Need of a Contradictory Discussion. **Educational Gerontology**, v. 44, n. 5-6, p. 338-353, 2018.

LAI, Horng-Ji. Investigating older adults' decisions to use mobile devices for learning, based on the unified theory of acceptance and use of technology. **Interactive Learning Environments**, p. 1-12, 2018.

LEE, Chaiwoo; COUGHLIN, Joseph F. Perspective: Older Adults' Adoption of Technology: An Integrated Approach to Identifying Determinants and Barriers. **Journal of Product Innovation Management**, v. 32, n. 5, p. 747-759, 2015.

LOBUONO, Dara L.; LEEDAHL, Skype N.; MAIOCCO, Elycia. Teaching Technology to Older Adults: Modalities Used by Student Mentors and Reasons for Continued Program Participation. **Journal of gerontological nursing**, v. 46, n. 1, p. 14-20, 2020.

NEVES, Bárbara. Pessoas idosas e tecnologias de informação e comunicação: inclusão digital como forma de inclusão social. **Revista Brasileira de Ciências do Envelhecimento Humano**, Passo Fundo, v. 15, n. 1, p. 8-20, 2018.

NIMROD, Galit. Aging Well in the Digital Age: Technology in Processes of Selective Optimization with Compensation. **Journals of Gerontology**: Social Sciences, v. XX, n. Xx, p. 1-10, 2019.

PALMORE, Erdman. Ageism comes of age. **The Journals of Gerontology**: Série B, v. 70, n. 6, p. 873-875, 2015.

QUAN-HAASE, Anabel et al. Dividing the Grey Divide: Deconstructing Myths About Older Adults' Online Activities, Skills, and Attitudes. **American Behavioral Scientist**, v. 62, n. 9, p. 1207-1228, 2018.

SCHEHL, Barbara. Outdoor activity among older adults: Exploring the role of informational Internet use. **Educational Gerontology**, v. 46, n. 1, p. 36-45, 2020.

SCHREURS, Kathleen; QUAN-HAASE, Anabel; MARTIN, Kim. Problematizing the Digital Literacy Paradox in the Context of Older Adults ' ICT Use: Aging, Media Discourse , and Self-Determination. **Canadian Journal of Communication**, v. 42, n. 2, p. 359-377, 2017.

SILVA, Ketia; BEHAR, Patrícia. Competências Digitais na Educação: uma discussão acerca do Conceito. **Educação em Revista**, Belo Horizonte, v. 35, e209940, 2019.

SZABO, Agnes et al. Longitudinal Analysis of the Relationship between Purposes of Internet Use and Well-being among Older Adults. **Gerontologist**, v. 59, n. 1, p. 58-68, 2019.

TAN, Seng C. Technologies for Adult and Lifelong Education. In: MILANA, Marcella et al. **The palgrave international handbook on adult and lifelong education and learning**. London: Palgrave Macmillan, 2018. P. 917-937.

TSAI, Hsin-yi. S.; SHILLAIR, Ruth; COTTEN, Sheila R. Social Support and "Playing Around": An Examination of How Older Adults Acquire Digital Literacy With Tablet Computers. **Journal of Applied Gerontology**, v. 36, n. 1, p. 29-55, 2017.

TYLER, Mark; DE GEORGE-WALKER, Linda; SIMIC, Veronika. Motivation matters: Older adults and information communication technologies. **Studies in the Education of Adults**, p. 1-20, mar. 2020.

VROMAN, Kerryellen G.; ARTHANAT, Sajav; LYSACK, Catherine. "Who over 65 is online?" Older adults' dispositions toward information communication technology. **Computers in Human Behavior**, v. 43, p. 156-166, 2015.

WANG, Ya-ling; HOU, Huei-Tse; TSAI, Ching-Chung. A systematic literature review of the impacts of digital games designed for older adults. **Educational Gerontology**, v. 46, n. 1, p. 1-17, 1 jan. 2020.

Karina de Lima Flauzino is a master's student in Gerontology at the University of São Paulo (EACH/USP). She is a specialist in Political Psychology, Public Policies and Social Movements and a Bachelor in Gerontology from EACH/USP.
ORCID: http://orcid.org/0000-0001-8062-3336
E-mail: karinageronto@gmail.com

Maria da Graça Campos Pimentel is a Full Professor at the Institute of Mathematical and Computer Sciences, University of São Paulo (USP). She holds a PhD in Computer Science from the University of Kent at Canterbury and a master's in Computer Science and Computational Mathematics from USP.
ORCID: http://orcid.org/0000-0001-8264-5811
E-mail: usp.mgp@gmail.com

Samila Sathler Tavares Batistoni is a Professor at the School of Arts, Sciences and Humanities, University of São Paulo. She holds a PhD in Education and a master's in Gerontology from the University of Campinas (UNICAMP).
ORCID: http://orcid.org/0000-0002-8587-8298
E-mail: samilabatistoni@gmail.com

Isabela Zaine holds a post-doctoral degree from the Institute of Mathematical and Computer Sciences, University of São Paulo, as well as a PhD and a master's in Psychology from the Federal University of São Carlos.
ORCID: http://orcid.org/0000-0003-0641-9761
E-mail: isabela.zaine@gmail.com

Lilian Ourém Batista Vieira holds a master's in Gerontology from the School of Arts, Sciences and Humanities, University of São Paulo. She is a Bachelor in Phonoaudiology from São Camilo University Center and a specialist in Clinical Audiology from the Santa Casa de Misericórdia de São Paulo.
ORCID: http://orcid.org/0000-0002-3223-9775
E-mail: lilian.cliquet@gmail.com

Kamila Rios da Hora Rodrigues is a Professor at the Institute of Mathematical and Computer Sciences, University of São Paulo. She holds a PhD and a master's in Computer Science from the Federal University of São Carlos.
ORCID: http://orcid.org/0000-0001-9176-8709
E-mail: kamila.rios@gmail.com

Meire Cachioni is an Associate Professor at the University of São Paulo. She holds a post-doctoral degree in Education from the University of Campinas (UNICAMP), as well as a PhD in Gerontology and a master's in Education from UNICAMP.
ORCID: http://orcid.org/0000-0001-5220-410X
E-mail: meirec@usp.br

Editor-in-charge: Beatriz Vargas Dorneles