Bridging the Digital Divide: Empowering Seniors and Adults with Low Literacy through Digital Literacy

Superando la brecha digital: Empoderando a los mayores y a los adultos con baja alfabetización a través de la alfabetización digital

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ABSTRACT
In today's digital age, digital literacy is crucial for societal participation, yet vulnerable groups like seniors and adults with low literacy face barriers leading to exclusion. This paper highlights these challenges, emphasizing the need for tailored digital literacy programs. Seniors struggle with rapid technological changes, while adults with low literacy face difficulties in accessing and using digital tools. By integrating digital technologies into adult education, these programs can empower both groups to engage confidently with the digital world. Reder's Digital Inclusion Pathway offers a framework for addressing access, readiness, and personalized learning, emphasizing the importance of "Digital Taste" in motivating learners to engage with digital tools.

RESUMEN
En la era digital actual, la alfabetización digital es fundamental para la participación en la sociedad, pero grupos vulnerables como las personas mayores y los adultos con baja alfabetización enfrentan barreras que los conducen a la exclusión. Este artículo aborda estos desafíos, destacando la necesidad de programas de alfabetización digital adaptados a sus necesidades específicas. Las personas mayores luchan con los rápidos cambios tecnológicos, mientras que los adultos con baja alfabetización tienen dificultades para acceder y utilizar herramientas digitales. La integración de tecnologías digitales en la educación de adultos puede empoderar a ambos grupos para participar con confianza en el mundo digital. El modelo de Reder de la "Ruta hacia la Inclusión Digital" ofrece un marco para abordar el acceso, la preparación y el aprendizaje personalizado, subrayando la importancia del "gusto digital" para motivar a los aprendices a involucrarse con las herramientas digitales.

Keywords: "Senior citizens", "adults with low literacy", "digital inclusion", "participation in society", "basic education"

Palabras clave: "Personas mayores", "adultos con baja alfabetización", "inclusión digital", "participación en la sociedad", "educación básica"

INTRODUCTION

In today's digital age, the ability to access and effectively use digital technologies has become essential for full participation in society. However, certain vulnerable groups, such as senior citizens and adults with low literacy skills, are at risk of being excluded from these advancements, creating a divide that affects their ability to engage in key aspects of modern life. These groups face unique challenges in adapting to the rapid pace of technological change, which can lead to their marginalization and social exclusion.

Technological advancements, particularly the widespread use of digital media and information and communication technologies (ICT), have transformed everyday life, reshaping how we communicate, work, and access essential services. Digital media now influences societal interactions and individual behaviors, making digital literacy critical for performing tasks like banking, shopping, and healthcare access. However, without the necessary digital skills, individuals face significant barriers, leaving them vulnerable to risks such as misinformation, identity theft, and manipulation.

Digital literacy goes beyond basic technical skills. As Marín and Castañeda (2023) suggest, digital literacy includes cognitive and critical engagement with technology, making it a key aspect of participating in a global, digital society. It enables individuals to navigate complex digital environments, think critically, and communicate effectively. Developing these skills empowers individuals to continuously learn and adapt, which is essential not only in professional contexts but also in everyday life. For vulnerable groups, such as seniors and adults with low literacy, gaining these skills can provide the confidence needed to engage with digital technologies, improving their overall quality of life.

Research highlights the strong correlation between low literacy and limited digital competency, creating a dual barrier that restricts participation in modern society (Buddeberg & Grotlüschen, 2020; Koppel & Wolf, 2021; Wicht, Reder & Lechner, 2021) Adults with low literacy often face limited access to digital devices and struggle to use them effectively, which in turn limits their engagement in key areas such as employment, finance, and decision-making (Grotlüschen, Buddeberg, Dutz, Heilmann, & Stammer, 2020; Buddeberg, 2019). Similarly, seniors face challenges in navigating digital technologies, often relying on external support for basic tasks. The COVID-19 pandemic underscored the critical role of digital media in maintaining social connections and accessing services, but many seniors found themselves excluded due to a lack of digital skills (Decker, 2015; Hummel, 2020). This digital divide underscores the urgent need for tailored digital literacy programs that address the specific needs of these vulnerable populations (Langer, forthcoming).

The digital divide among both seniors and adults with low literacy highlights the need for comprehensive adult education programs that incorporate digital technologies. Studies like the ICILS (Bos, Eickelmann, Gerick & Labusch, 2019) show signifi-

cant gaps in digital skills across age groups, emphasizing that both younger and older generations require targeted support. Digital technologies offer opportunities for flexible, personalized learning, and the integration of these tools into education can help bridge gaps in both literacy and digital competency (Wolf & Koppel, 2017).

To fully equip learners with the necessary digital skills, the concept of media competency must be considered. As Baacke (1996) explains, media competency involves not just technical skills but also the ability to critically evaluate media, understand media systems, and creatively apply media tools. For both seniors and adults with low literacy, developing proficiency in these areas is essential for full participation in today's digitalized world.

Additionally, shifts in the employment landscape highlight the increasing demand for advanced cognitive skills, including the ability to interpret and communicate complex information (OECD, 2012). As more jobs require digital competency, adults with low literacy and seniors face the risk of being left behind. Lifelong learning, particularly in digital literacy, is vital not only for professional development but also for maintaining independence in everyday life. In Germany, where lifelong learning is a national priority, 6.2 million adults still struggle with low literacy, further compounding the challenge of digital inclusion (Grotlüschen et al., 2020).

As digital technologies become more integrated into daily life, it is clear that both seniors and adults with low literacy face the risk of exclusion without the appropriate tools and support. Addressing this challenge requires a comprehensive approach that provides access to technology and ensures that individuals have the skills to use these tools effectively. The Digital Inclusion Pathway, developed by Reder (2015), offers a framework for addressing these needs. It emphasizes the importance of access, readiness, and personalized learning experiences, all of which are crucial for bridging the digital divide.

This paper seeks to address how digital inclusion can be fostered for vulnerable adult populations, such as seniors and adults with low literacy, in adult education courses. Specifically, it explores the role of "Digital Taste" in the individualized development of digital skills, offering insights into how personalized, life-world-oriented education can empower these groups to navigate and thrive in the digital world.

ADAPTING TO DIGITAL REALITIES: THE NEEDS OF ADULTS IN A MEDIATIZED SOCIETY

In an increasingly digitalized world, access to and the ability to use digital technologies have become essential prerequisites for full participation in society. However, certain vulnerable groups, such as senior citizens and adults with low literacy skills, are at risk of being excluded from these developments. These groups face unique challenges in adapting to the rapid pace of technological change, which can lead to their marginalization from essential aspects of modern life.

The Role of Digital Media in Modern Society

Technological advancements and the widespread integration of information and communication technologies (ICT) have profoundly transformed daily life. Over the past few decades, digital media has not only reshaped communication practices but also influenced societal interactions and individual behaviors, altering how people engage with information and the media itself (cf. Wolf & Koppel, 2017). From banking and shopping to accessing healthcare and social services, an increasing number of everyday tasks now rely on digital literacy to be performed efficiently and securely. According to a survey conducted by Statista on E-Health, 27% of individuals use at least one digital health device. Additionally, the data indicates a growing trend in online medical appointments. Ireland leads Europe with the highest proportion of online doctor appointments, with 52% of its population utilizing this service (Statista Content & Design, 2020). Without the necessary skills to navigate these technologies, individuals face significant barriers to fully participating in modern life (Koppel & Langer, 2020), exposing them to risks such as identity theft, misinformation, and manipulation by fake news.

Digital literacy, however, is more than just technical proficiency. As Marín and Castañeda (2023) assert,

> "Technology is not just a set of tools for doing specific things anymore. Technology is a way of thinking, is an incredible market, is a scenario of political debate and fight, is a part of human nature, and is a reality that configures existence in many ways" (p. 1104).

Thus, digital literacy encompasses not only the ability to use digital tools but also the cognitive and critical capacities to engage with these tools as part of a broader societal and cultural landscape. It includes the knowledge and skills necessary to apply digital technologies in everyday literacy practices, as well as the mindset required to think, participate, and communicate effectively within a global, digital society.

Fundamental digital skills are essential for individuals to acquire and deepen knowledge in various fields. These skills build self-confidence in using technology, not only in the workplace but also in lifelong learning and everyday activities. As Fernandez Sanz (2023) highlights, digital literacy is a critical enabler for continuous learning, adaptation, and empowerment in modern life, both personally and professionally.

The Intersection of Low Literacy, Digital Competency, and the Digital Divide

Research has shown a strong link between low literacy levels and limited digital competency, forming a dual barrier to participation in modern society (Buddeberg & Grotlüschen, 2020; Koppel & Wolf, 2021; Wicht, Reder & Lechner, 2021). Adults with low literacy skills often face restricted access to digital devices like computers, and even when they do have access, their ability to effectively use these tools is lim-

ited (Grotlüschen et al., 2020). This digital exclusion creates significant challenges in areas such as employment, finance, housing, and informed decision-making, leaving these individuals at a considerable disadvantage (Buddeberg, 2019). The lack of digital skills in conjunction with low literacy exacerbates their marginalization, further widening the digital divide.

Senior citizens represent another vulnerable group in this context. Many seniors experience frustration and confusion when interacting with digital technologies, as exemplified by the elderly character in the film *Traumfrauen* who exclaims, "I think I've deleted the internet" (Decker, 2015). The COVID-19 pandemic underscored the essential role of digital media in maintaining social connections and accessing services. The challenges faced by older adults, who are often marginalized when it comes to digital technologies, have been highlighted by the COVID-19 pandemic, which made evident how much they struggle to participate in a digital society (Engels, 2020). However, seniors often lack the necessary digital skills to independently navigate this digital world, frequently relying on family members or neighbors for assistance with tasks such as booking vaccination appointments or using online communication tools (Hummel, 2020; Bildungszentrale für politische Bildung, 2020).

Given that older adults now make up a significant portion of the population (Statistisches Bundesamt, 2023), integrating them into digital learning is essential. The European Union's Action Plan for Digital Education aims to offer comprehensive solutions, promoting "high-quality, inclusive, and accessible digital education in Europe" (European Commission, 2023). This initiative seeks to bridge educational inequalities, ensuring that even marginalized groups, including seniors, can benefit from digital learning.

The growing digital divide among both seniors and adults with low literacy highlights the urgent need for comprehensive digital literacy programs. Studies like the ICILS (Bos, Eickelmann, Gerick & Labusch, 2019) emphasize the significant gaps in digital skills across various age groups, making it clear that action is needed not only for younger generations but also for older adults and those with limited literacy. Adult education systems must incorporate digital technologies in their curricula to ensure that all learners are equipped with the skills needed to navigate a digitally driven world (European Commission, 2015; Helbig & Hofhues, 2018).

Digital technologies offer vast opportunities for lifelong learning through flexible, personalized approaches that cater to the needs of individual learners. Adults in basic education, in particular, can benefit greatly from the use of digital media, which provides tools for learning that are accessible anytime and anywhere (UNESCO Institute for Lifelong Learning, 2016). The integration of digital tools in educational programs can help bridge both literacy and digital competency gaps for vulnerable populations, including adults with low literacy (Wolf & Koppel, 2017). At the same time, instructors face the challenge of developing their own media-pedagogical competencies, which may be limited, especially in basic education settings (Rohs, Schmidt-Hertha,

Rott, & Bolten, 2019). It is important for instructors to reflect on their digital skills and integrate them into the course design based on the institutional resources available.

To fully equip individuals with the necessary digital skills, the concept of media competency must be explored. According to Baacke (1996), media competency is closely tied to communicative competency, or the ability to actively engage with media in meaningful contexts. Baacke identifies four key dimensions of media competency: media critique, media knowledge, media usage, and media design. These dimensions include the critical evaluation of media content, understanding media systems, practical skills for using media, and the creative application of media for innovation (Baacke, 1996). Ensuring that learners develop proficiency across all of these dimensions is essential for fostering true digital literacy and preparing them for full participation in modern society.

Shifts in Employment and Education: The Need for Cognitive and Digital Skills

In recent years, the employment landscape has seen significant changes, with a growing demand for advanced cognitive skills, including the ability to interpret, analyze, and communicate complex information (National Training Strategy, 2019; OECD, 2012). Basic skills such as reading comprehension and numerical literacy are critical for active participation in both social and professional contexts (Vágvölgyi, Coldea, Dresler, Schrader, & Nuerk, 2016; Rammstedt, 2013). In response, adult education systems play a crucial role in equipping individuals with these necessary skills, enabling them to take control of their personal and professional development (UNESCO Institute for Lifelong Learning, 2016).

Germany, as a leader in adult education, invests significantly in lifelong learning, allocating over 4% of its education budget to this area (UNESCO Institute for Lifelong Learning, 2016). Despite these efforts, 6.2 million adults in Germany still struggle with low literacy skills (Grotlüschen et al., 2020). These individuals often possess only rudimentary literacy, limiting their ability to engage meaningfully in society. Beyond traditional literacy, participation in modern life increasingly requires skills in digital literacy, including financial, health, and media literacy (Couldry & Hepp, 2016; Tröster & Schrader, 2016).

The digital divide, however, affects not only adults with low literacy skills but also seniors, who often lack the digital competencies necessary for navigating an increasingly tech-dependent society. While seniors may no longer be actively employed, they still need digital skills for everyday tasks such as managing healthcare, accessing online banking, or engaging in social activities through digital platforms. Lifelong learning, therefore, extends to older generations, emphasizing the importance of digital literacy for maintaining autonomy and full participation in daily life.

As the digital landscape continues to expand, both senior citizens and adults with low literacy face the risk of exclusion if they are not provided with the tools and training to acquire and develop digital skills. People with low literacy often do not have the necessary knowledge or access to training that could help them use digital media effectively (ELINET, 2016). This deepens the digital divide and leads to a widening of existing social inequalities (Durgunoğlu, Langer, & Cantürk, forthcoming). This highlights the urgent societal need for inclusive digital education programs that foster cognitive development and technological fluency across all age groups, ensuring that vulnerable populations can navigate modern life with confidence.

Towards Digital Inclusion: Bridging the Gap

In light of the increasing digitalization of all aspects of life, fostering digital inclusion for vulnerable groups, such as senior citizens and adults with low literacy, has become a pressing issue. Achieving this inclusion requires a focus on digital literacy as a pathway to educational equity, empowering individuals from all backgrounds to engage fully in the digital world and in society at large.

One framework that offers valuable insight into promoting digital inclusion is Reder's Digital Inclusion Pathway (2015), which was developed based on data from the Programme for the International Assessment of Adult Competencies (PIAAC). This model highlights the crucial steps needed to provide equitable access to digital technologies and the skills required to navigate them effectively.

The first step in Reder's model is ensuring *access* to technology, which is often a significant barrier for both seniors and adults with low literacy. This access includes not only the availability of digital devices, such as computers or smartphones, but also affordable internet services and user-friendly interfaces. However, significant disparities emerge even at this initial stage, with noticeable differences in access to computers among households across different countries. According to the OECD (2022), "access to computers from home" is defined as the number of households that report having at least one functioning personal computer, and this indicator is measured as a percentage of all households. These disparities illustrate the ongoing challenge of achieving digital inclusion, particularly for vulnerable groups who may lack the necessary resources or infrastructure.

The pathway also stresses the importance of creating personalized learning experiences that cater to the specific needs and interests of individuals. This is where the concept of "*Digital Taste*" becomes particularly relevant, as it focuses on engaging individuals with digital tools and resources that align with their personal preferences and needs. Since overcoming the barrier of "Digital Taste" marks the starting point for the potential development of basic digital skills, it can be assigned a key role in successful learning with digital media in basic education. As previously mentioned, the relevance of this

stage is also reflected in the few empirical indicators that exist regarding the (learning-oriented) use of digital media by individuals with low literacy skills. Based on an initial connection of these insights to "Digital Taste" as a stage of the Digital Inclusion Pathway, the conclusion can be drawn that, in addition to technical access, the digital selection and usage patterns of course participants should be given much greater consideration in didactic planning. The terms 'course participants' and 'learners' in the following refer to adults with low literacy enrolled in basic education courses. Although "Digital Taste" is a somewhat elusive concept, recent studies and reflections suggest that it can be observed and described through Bourdieu's theory of habitus (1987) (see, for example, Bolten-Bühler, 2021), as well as motivation-related aspects (Bandura, 1977; Brunstein, 2018). As David, Langer, and Koppel (2022) point out, the concept of "Digital Taste" can be incorporated into instructional designs within basic education, helping to better align digital media use with learners' needs and preferences.

Reder's pathway then emphasizes the development of digital skills - ranging from basic operational abilities to more complex competencies such as problem-solving and critical thinking in digital environments *(Readiness Stage)*. For both seniors and adults with low literacy, these skills are crucial for managing everyday tasks, such as online banking, healthcare management, and communication through digital platforms. Without these skills, these populations face a significant risk of digital exclusion, which can limit their ability to participate in critical aspects of modern life.

By aligning educational programs with Reder's pathway, adult education initiatives can foster a more inclusive digital learning environment that empowers vulnerable populations to take ownership of their digital literacy journey.

As Beach, Kerkhoff & Langer (forthcoming) argue,

> "Quite simply, we believe that educational equity can be achieved through digital literacy practices and access, from urban to rural communities for youth and adults, which create possibilities for all to actively engage in digital spaces and with the world around them."

With this in mind, this paper seeks to address the following question:

How can digital inclusion be fostered for vulnerable adult populations, such as seniors and adults with low literacy, in adult education courses, and what role does the concept of "Digital Taste" play in the individualized development of digital skills?

The following section will outline the methodology used to explore these questions.

METHODOLOGY

The research questions presented focus on two vulnerable groups in society: seniors and adults with low literacy skills. Both groups were addressed in two distinct studies. Adults with low literacy were the focus of the GediG project (2019-2023), while the master's thesis by Hannah Hipp (2023), which I supervised, explored the

challenges of digital literacy for seniors participating in adult education courses, particularly in the context of media competency as a key challenge in the 21st century. Both methodological approaches are outlined below.

The GediG project (funded by the Federal Ministry of Education and Research) investigated the conditions for the successful use of digital media in adult basic education, focusing specifically on participants with low literacy skills. These learners, who typically aim to improve their reading and writing abilities, now also include individuals acquiring German as a second language, broadening the initial focus of the courses (Rieckmann, Glück-Grasmann & Richter, 2022; Mazza & Steger, 2023). Various adult education providers, such as public institutions, and private organizations, were involved in the project, with key stakeholders including course designers, educational leaders, and instructors - all of whom play essential roles in integrating digital tools into adult education settings.

The GediG project employed a Convergent Mixed-Methods Design (Creswell, 2022), integrating both qualitative and quantitative surveys to comprehensively examine the success factors of using digital media in adult basic education. This design allowed for data collection from multiple stakeholders across different levels, ensuring a well-rounded understanding of various perspectives.

In the qualitative portion of the study, guideline-based expert interviews were conducted with institutional leaders and conceptual staff (N = 14), as well as course instructors (N = 17). These interviews aimed to identify the success factors at both the institutional and course levels for integrating digital media in adult education. Additionally, focus groups were held with participants in basic education courses (N = 23) to gain insights into the success factors from the learners' perspective. To further explore how digital media is applied in practice, course observations (N = 3) and roundtable discussions (N = 4) were conducted, providing a more in-depth understanding of the practical use of these tools in educational settings. Moreover, a heuristic evaluation of apps and programs for basic education (N = 10) and everyday digital assistants (N = 19) was carried out to assess the suitability of these tools in enhancing learning experiences for participants.

On the quantitative side, data were collected through online questionnaires administered to various stakeholders in the education system. Institutional leaders and conceptual staff (N = 58), course instructors (N = 49), and participants in basic education courses (N = 74) provided responses that were aimed at identifying the prerequisites and practical implementation of digital media usage at three different levels: the institutional and conceptual level, the course level, and the individual learner level. These surveys allowed the researchers to map out the conditions under which digital media can be effectively integrated into adult education, thus supporting learners in improving their digital competencies.

The data integration process combined both qualitative and quantitative data, providing a comprehensive understanding of the conditions for successful digital media

use in basic education. This approach revealed key barriers and success factors at the structural, pedagogical, and individual levels, and enabled the identification of good practice examples for teaching and learning with digital media.

Despite challenges posed by the COVID-19 pandemic, including suspended courses and difficulties in achieving representative sample sizes, the validity and reliability of the survey instruments were ensured through factor analyses (Bühner, 2021; Moosbrugger, 2012). Expert interviews with stakeholders offered further insights into the use and accessibility of digital media (Döring, 2023; Helfferich, 2022), conducted via video conferencing with pilot-tested guidelines to maintain consistency. Focus groups (Kühn & Koschel, 2018; Stewart, & Shamdasani, 2015; Crabtree, Yanoshik, Miller, & O'Connor, 1993) were also used to gather participant perspectives. Both qualitative and quantitative data were collected and analyzed concurrently.

In the study by Hipp (2023), problem-centered guided interviews were conducted with the head of an adult education institution, two instructors of courses for seniors focusing on the use of digital media, and three seniors who had attended such courses (Witzel, 1985, N = 6).

In both studies, interviews as well as focus groups were audio-recorded, transcribed, anonymized, and analyzed using content-structuring techniques (Kuckartz, 2018), supported by the software MAXQDA (Kuckartz & Rädiker, 2020; Loxton, 2021).

These combined methodological approaches provide a robust framework for understanding how digital media can support both vulnerable groups in acquiring essential competencies in a rapidly digitalizing world, as will be demonstrated in the next section.

RESULTS

How to Foster Digital Inclusion for Vulnerable Adult Populations in Adult Education Courses: Insights from Adults with Low Literacy and Senior Citizens

In addressing the central research question, "How can digital inclusion be fostered for vulnerable adult populations, such as seniors and adults with low literacy, in adult education courses, and what role does the concept of 'Digital Taste' play in the individualized development of digital skills?" it is essential to consider two vulnerable groups that face different challenges in accessing and using digital technologies: adults with low literacy skills and senior citizens. Both groups were studied through different research projects - adults with low literacy in the GediG project and senior citizens in the master's thesis by Hannah Hipp (2023). Each group presents specific challenges and needs in relation to digital inclusion in adult education courses. Below, I will summarize key findings from both studies to provide insights into how digital inclusion can be fostered for these populations. In the discussion, a comprehensive approach

will be outlined that not only addresses the unique needs of each group but also integrates their common challenges. This approach will propose a model to effectively guide both vulnerable groups toward achieving successful digital inclusion.

Access to Digital Media in Adult Education Institutions

One of the first questions addressed in the GediG project focused on access to digital media in adult education institutions. The results showed that while computers or laptops are widely available for instructors, other essential tools like tablets and document cameras are less common. Although beamer projectors and digital whiteboards are present in many institutions, only 78% have headsets, which are especially useful for individualized learning. Moreover, virtual reality (VR) headsets are available in just 7% of institutions, highlighting the limited use of cutting-edge technologies in these settings. The variability in access to these resources often depends on the number of learners, which presents challenges. For example, 10% of instructors lack access to any computers or laptops, and in 25% of cases, the equipment is insufficient to provide a 1:1 learner-to-device ratio. Similarly, 40% of institutions lack adequate tablets. This disparity in access to technology directly impacts the ability to effectively use digital media in adult basic education courses, which can hinder the individualized support that learners, particularly those with low literacy, need to succeed. Participants in the study pointed to the importance of integrating digital devices relevant to their daily lives, such as smartphones and tablets.

Internet Access as a Key Component of Digital Inclusion

Access to the internet also plays a crucial role in fostering digital inclusion. It is not just about having the necessary digital devices but also having access to reliable internet connections. Many participants have internet access at home, but not all have unlimited mobile internet access. This lack of constant connectivity hinders the use of apps and online resources outside the classroom. For courses held outside institutional settings, where internet access may be limited or non-existent, mobile routers can offer a solution. However, such resources are not universally available, adding to the challenges learners face in accessing digital resources.

Impact of Access on Course Design and Learning Outcomes

We also explored the consequences of access to digital media on course design and the successful use of digital tools. Learners expect that their experience with digi-

tal media will be directly related to their everyday lives and that their specific questions and challenges will be addressed. Focus group discussions revealed that learners do not just want to learn basic computer functions; they also seek practical knowledge, such as how to dictate, save, and send files independently. This need for an approach grounded in real-life experiences emphasizes that digital inclusion efforts must account for learners' private access to digital media as well. Instructors who recognize and address these individual needs play a key role in making digital media integration successful in adult basic education courses. The concept of "Digital Taste," which refers to learners' personalized preferences for digital tools and their willingness to engage with technology, becomes important here, as it allows for tailored approaches that resonate with the learners' unique contexts.

Readiness and the Role of Instructors

In the triangle of stakeholders responsible for successful digital media integration in adult education - course instructors, institutional leaders, and curriculum designers—the role of the instructor is critical. The GediG project highlights the importance of instructors in preparing learners for digital inclusion, particularly through the "Readiness" stage of Reder's (2015) Digital Inclusion Pathway. Instructors play a central role in building learners' confidence and competence in using digital media, creating the conditions for success. The findings reveal that instructors are already aware of the importance of digital media and have often participated in professional development on the subject. However, the question remains how to structure these digital learning experiences to ensure they meet the needs of adult learners with low literacy.

Participants in the GediG project, specifically learners in basic education courses, reported having access to smartphones but felt less comfortable using laptops or computers and expressed concerns about data privacy online. They recognized the importance of developing digital skills but required more focused support from instructors, particularly when dealing with unfamiliar digital tools. Conversely, instructors generally had a broader range of digital resources available to them and rated their ability to teach with digital media differently. Institutions supported these efforts by providing access to devices and Wi-Fi while also promoting the development of instructors' digital competencies.

Digital Competency and Barriers for Senior Citizens

Senior citizens, a second vulnerable group, face different but equally significant challenges when it comes to digital literacy. Many seniors struggle with using digital tools due to a lack of prior experience and ongoing support. Their digital literacy often

lags behind, which is exacerbated by the rapid pace of technological advancement. As one senior citizen expressed, they often feel overwhelmed by the variety and complexity of digital devices available today. This lack of familiarity with technology can lead to frustration, and seniors frequently find themselves reliant on younger family members for assistance, which further perpetuates their sense of inadequacy.

However, solutions are available to overcome these challenges. Participation in adult education courses, such as those offered by Volkshochschulen (VHS) in Germany, provides an opportunity for seniors to gain the digital skills needed to manage their lives more independently. Through these courses, seniors are equipped to handle tasks like online banking, communication with family, and participation in social activities via digital platforms. The ability to stay updated and connected becomes essential for seniors, particularly in maintaining family ties and staying informed about societal changes. By learning how to use digital media, seniors not only gain autonomy but also remain active participants in their families and communities. As the interviews with seniors revealed, learning to use digital devices in a structured course setting significantly improved their ability to manage daily tasks and communicate effectively with others.

All the seniors interviewed reported that by attending a VHS course, they were able to acquire important skills and experience an increase in competence and confidence in using digital tools.

CONCLUSION AND REMAINING GAPS

The research question, "How can digital inclusion be fostered for vulnerable adult populations, such as seniors and adults with low literacy, in adult education courses, and what role does the concept of 'Digital Taste' play in the individualized development of digital skills?" directly relates to the findings from both the GediG project and research on senior citizens, which highlight the critical role of access to digital media and the readiness of both learners and instructors in promoting digital inclusion. While access to digital tools is a foundational step, the integration of these tools into adult education courses requires more than just availability; it depends on the personalized, real-life contextualized approaches that instructors adopt, as well as the tailored support learners receive.

The challenges faced by seniors and adults with low literacy are distinct yet interconnected. Seniors frequently struggle to keep up with the rapid pace of technological advancements and depend heavily on external assistance, whereas adults with low literacy not only face challenges in accessing digital tools but also in effectively using them due to limited literacy skills. The Digital Inclusion Pathway (Reder, 2015) offers a framework to address these challenges by focusing on the key components of access, readiness, digital taste, and personalized learning experiences. Incorporating these el-

ements into adult education courses can bridge the digital divide, enabling vulnerable populations to develop the digital skills they need to confidently navigate and engage with the digital world. This structured, multifaceted approach answers the research question by demonstrating how "Digital Taste" plays a crucial role in motivating learners to embrace digital tools in ways that align with their individual needs and contexts.

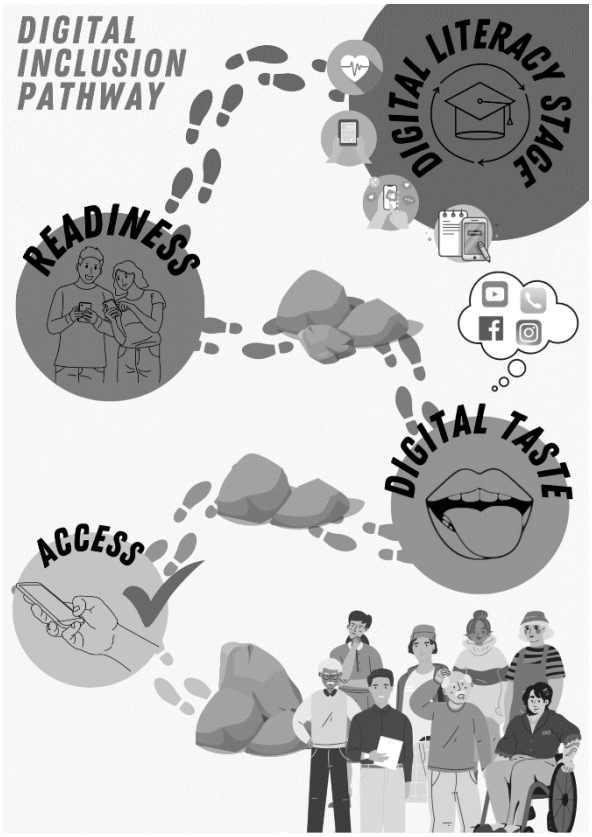

FIG. 1: Digital Inclusion Pathway, adapted from Reder (2015) within the GediG project

The Digital Inclusion Pathway begins with *Access*, which involves providing the necessary technology - such as smartphones, computers, and internet connections - within adult education settings. For both seniors and adults with low literacy, access to appropriate devices is a critical first step toward digital competency. It is equally important to address internet access, as the results indicate that it is not always readily available to all participants in basic education courses. However, access alone is insufficient.

A key component is cultivating *Digital Taste* or fostering personal interest and motivation to engage with digital platforms. For seniors, this might mean teaching them

how to stay connected with family or manage health care online, while for adults with low literacy, this could involve making learning more interactive and relevant through digital tools that support their literacy development. This stage is critical in transforming hesitant learners into active participants who are motivated to explore further digital opportunities. Since overcoming the barrier of "Digital Taste" marks the starting point for the potential development of basic digital skills, it can be assigned a key role in successful learning with digital media in basic education. As previously mentioned, the relevance of this stage is also reflected in the few empirical indicators that exist regarding the (learning-oriented) use of digital media by individuals with low literacy skills. Based on an initial connection of these insights to "Digital Taste" as a stage of the Digital Inclusion Pathway, the conclusion can be drawn that, in addition to technical access, the digital selection and usage patterns of course participants should be given much greater consideration in pedagogical planning.

Readiness represents the next stage, where learners must be adequately prepared to engage with digital tools. This involves not only technical training but also addressing their unique anxieties and building confidence in using technology for everyday tasks like online banking or communication.

Finally, the *Digital Literacy Stage* signifies the successful application of digital skills in real-world contexts, whether it be through social media engagement, online learning, or professional communication. This is the point where both vulnerable groups can fully integrate digital tools into their daily lives, enhancing not only their ability to participate in society but also their sense of autonomy and confidence.

By following this structured pathway, educators and institutions can create tailored learning environments that address the specific needs of seniors and adults with low literacy. The holistic approach outlined in the Digital Inclusion Pathway offers a model for fostering digital literacy in a way that empowers these groups to thrive in an increasingly digital world.

The Digital Inclusion Pathway illustration serves as a visual representation of this process and underscores the steps necessary for achieving meaningful digital inclusion in adult education courses. This model provides a roadmap for bridging the digital divide and supporting vulnerable populations in becoming confident, capable digital citizens.

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