

FAMILY MATTERS – WARM EXPERTS, OLDER ADULTS AND SOCIAL SUPPORT FOR LEARNING: A SEQUENTIAL EXPLORATORY MIXED-METHODS APPROACH

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Abstract: *The extent and quality of social support for learning provided by warm experts has received limited scholarly attention. Using a sequential exploratory mixed-methods approach, and a point of departure in theory regarding opportunities for and barriers to learning, the study starts with qualitative interviews with 22 individuals aged 70-94. Relationships between older adults and their children and grandchildren are analyzed, and experiences of opportunities and barriers for learning are identified. These findings are operationalized into items in a survey distributed to a representative sample of Sweden's population aged 65-90 (n=1,610), to measure variations in the quantity and quality of social support for learning. Findings reveals that children are mainly engaged as warm experts, and the more frequently families meet, the more frequently support for learning takes place, and the higher the perceived quality. Age, income and education, show no relationship with the perceived quality of social support for learning.*

Keywords: *warm expert, older adults, mixed-methods design, learning, digital media.*



INTRODUCTION

Digitalisation is an ongoing process in large parts of the world. This affects all areas of social life, from how banking services are offered, via everyday social media encounters, to the ways in which we arrange and receive healthcare. In fact, it is taking place in all societal spheres, in the market, in civil society, and in the state in its varying formations (Hepp, 2019).

One particularly salient aspect of digitalisation is the ways in which digital information and services are becoming the preferred mode for contact between welfare providers and their users. The re-shaping into digital information and interaction covers a wide span of public services. These include healthcare services (Sætra & Fosch-Villaronga, 2021), citizens' interaction with tax agencies (O'Sullivan & Walker, 2018) and information from and communication with municipal service agencies (de Mello & Ter-Minassian, 2020). The re-shaping of welfare services is a global phenomenon, but it is particularly advanced in certain parts of the world. According to the DESI-index (DESI, 2022), Finland, the Netherlands, Denmark and Sweden have been particularly quick to appropriate digital technology for all kinds of public information and services.

In the Swedish case, as for instance in Denmark (Pors & Schou, 2021; Schou & Hjelholt, 2018), the digital transformation of public information and services is based on an overall and explicitly stated governmental vision. The ambition is to make digital information and services the default choice in public sector contact with individuals and organisations (Digg, 2023). While this development is obviously beneficial to a lot of people, as it can make governmental services and information more accessible and perhaps also more effective, is it also challenging. It is especially challenging for those who are not as comfortable with digital technology as the 'digital by default' policy implicitly suggests that they ought to be. Relating to extant research it becomes obvious how this development potentially becomes specifically challenging for some parts of the citizenry. Older adult citizens are certainly one of these groups (cf. Friemel, 2016; Llorente-Barroso et al., 2023). There are, of course, important differences between older adults when it comes to their degree of access to and abilities to use digital technology (Olsson et al., 2019a; Olsson et al., 2019b), but as a group they are not in any obvious ways beneficiaries of the digitalisation of public information and services (Marston & van Hoof, 2019). As an overall process, digitalisation contrasts starkly with older adults' more limited access to digital media, their more limited abilities to make use of them, and – importantly – their rather weak interest in digital information and services and preference for other methods (Olsson & Viscovi, 2023). In fact, both structural and individual factors have an impact on the extent to which older adults appropriate ICTs and develop necessary literacy (Kärnä et al., 2022).

In this context research has come to pay attention to the actual and potential role of *warm experts* (Bakardjieva, 2005) as mediators between digital opportunities and the everyday lives of older adults. The warm experts are 'nonprofessional persons who help more inexperienced users come to terms with digital devices and services' (Olsson & Viscovi, 2018, p. 324), and in the literature they have received increasing research attention focusing on *what* sort of support they can offer and *how* they do that in the everyday lives of older adults (see below). However, the extent to which this social support from warm experts also *provides sustainable opportunities and support for older adults' learning* have so far been paid very little

systematic research attention. To start compensating for this deficit, to gain insights into older adults' actual *learning* with warm experts, this article centres on five research questions:

RQ 1: Who becomes engaged as warm experts for older adults' learning?

RQ 2: To what extent are the different categories of warm experts engaged?

RQ 3: How is the quality of support for learning perceived by older adults?

Our initial findings (see below) reveal that older individuals' children occupy a special position as by far the most involved category. We therefore also ask:

RQ4: Is there a connection between the extent of socialising between generations and the extent of support for learning?

RQ5: Is there a connection between the extent of socialising in families and the perceived quality of support for learning?

In order to answer the RQs, we followed a sequential exploratory mixed-methods design (Creswell & Plano Clark, 2017). Hence, our results and analyses are presented in six consecutive steps, starting from the construction of an interview guide based on the notion of warm experts and Illeris' (2017) theorising regarding opportunities for and barriers to learning (step 1) and ending with the execution of factor and regression analyses (step 6).

Warm Experts and the Quality of Social Support for Learning

The notion of *warm experts* was established by Maria Bakardjieva in her book *Internet Society: The Internet in Everyday Life* from 2005. Drawing on rich ethnographic data covering the domestication of computers and the internet in Canadian households at the turn of the millennium, Bakardjieva illustrated the importance of friends and family in helping novice users start using their home computers and enter the online world. At that time, their support typically included dealing with technical obstacles (hardware issues, internet connections, etc.) and offering support in suggesting what could be useful areas of usage for the equipment. In the words of Bakardjieva, the warm expert 'mediates between the technological universal and the concrete situation, needs and background of the novice user with whom he is in a close personal relationship' (Bakardjieva, 2005, p. 99).

Since the turn of the millennium, many important changes have taken place. Internet usage technologies have multiplied, and now include devices such as smartphones, tablets, and smart watches, to mention just a few examples. Meanwhile, the very meaning of 'the Internet' has also been transformed. In the early 2000s, the internet was still mainly perceived, and used, as a source of information ('searching on the internet') and communication (mainly email). Today, the internet has instead become the very backbone of digitalisation, and now encompasses all aspects of our everyday lives, from banking to contact with healthcare, shopping and maintaining social networks via social media applications. This reshaping of our everyday lives has several implications, but in this context it is specifically relevant to consider how it has most definitely not made the role of the warm expert any less relevant. The potential need for everyday support has increased rather than decreased. Such support can be provided by different actors, for instance older adult teachers

and tutors in an instructional project (Pihlainen, Korjonen-Kuusipuro, & Kärnä, 2021) or – as in our case – by people identified as warm experts.

The continued importance of warm experts is also mirrored in the research literature. This research offers, for instance, important insights into the identity of warm experts. According to Comunello et al. (2017), older adults' warm experts are often found in their networks of younger relatives, most often among children and grandchildren. Drawing on Swedish survey data from 2015, Olsson and Viscovi (2018) revealed a preference among older adults to get assistance from their children rather than their partners or grandchildren. The guiding role of younger relatives is also the topic in Barrantes Cáceres and Cozzubo Chaparo (2019). That study shows how 'the presence of minors in older adults' households encourages their access to the internet' (p. 263).

Apart from paying attention to who the warm experts are, research has also offered insights into what types of support they typically offer. When studying warm experts, Leong (2017) points out how they often become involved in doing the actual downloading and installation of programs and applications. Drawing on domestication research, Olsson and Viscovi (2018) revealed how warm experts play an important part in all stages of domestication, ranging from initial discussions before a decision to acquire digital devices is made to actual everyday usage. Oreglia and Ling (2018) note how warm experts are important assets when it comes to older adults' 'digital imagination'. They play a part in framing how to make sense of technologies and how to use them.

Together with similar studies (cf. Courtois & Verdegem, 2016; Hänninen et al., 2021; Neville, 2021), the research efforts referred to above have made important contributions to our knowledge of *who* warm experts are and *what* sort of support they offer to older adults. In our view, however, the research conducted so far falls short regarding at least two different aspects. Firstly, research has so far, and with very few exceptions, fallen short when it comes to offering insights into the actual *quality of social support for learning*, the extent to which older adults learn and develop from support offered by warm experts. The quality of social support has been touched upon by Helsper and Van Deursen (2017); their quantitative survey analysis introduced the notion of quality of social support, which they operationalised by 'asking the respondents who received support in the past three months whether they felt they would still need support the next time in a similar occurrence' (p. 706). The question obviously refers to learning and development. However, it offers little detail regarding both the forms and content of social support for learning. This article has the ambition to both (qualitatively) elaborate on the notion of social support for learning and (quantitatively) develop measures to assess its quality.

Secondly, the literature on warm experts is almost exclusively derived from qualitative research. It draws on group interviews (Hänninen et al., 2021), focus groups and semi-structured interviews (Madsen & Kræmmergaard, 2016), qualitative thematic analysis of videos and viewer comments on YouTube (Neville, 2021), as well as observations and case surveys (Sawchuk & Lafontaine, 2022). The research has offered rich insights into everyday life around digital applications, and the important part played by networks for social support. It has also been theoretically suggestive. This article adds to this knowledge by presenting research that departs from insights derived through qualitative research but elaborates on the findings in ways that allow the establishment of statistically generalisable insights derived from a national survey.

A Sequential Explorative Mixed-methods Design

According to Creswell and Plano Clark (2017), an explorative mixed-methods design combines qualitative and quantitative data collection and analysis in a sequential manner. It starts with a phase that involves the collection and analysis of qualitative data, which then provides the basis for the collection and analysis of quantitative data. The qualitative phase is designed to help generate hypotheses and explore the context of the phenomenon, whereas the quantitative phase allows for generalisation based on statistical analysis (cf. Creswell, 2014).

At a more detailed and specific level, our approach is inspired by the sequential approach developed in Cabrera's study of racial hyperprivilege in higher education (Cabrera, 2011). As in Cabrera, our approach follows several consecutive steps, from initial conceptualisation and then the interview phase through to collection and analysis of quantitative data. This is also how our methods and analyses will be presented in the following sections.

Step 1 centres on the construction of our interview guide for interviews with older adults with experience of learning about digital media from their children and/or grandchildren. In this phase, the theoretical notion of warm experts, above all learning with warm experts, and Illeris' (2017) theorising regarding opportunities for and barriers to learning, is specifically informative regarding which areas are to be covered during the interviews (see also Martínez & Olsson, 2022).

Step 2 covers both the recruitment of interviewees and the actual interview procedures. For the recruitment we used a purposive sampling, but the selection also involved additional considerations, such as including people with different ages, genders and socio-economic backgrounds. The interview procedures include the actual and somewhat different ways in which the interviews were executed.

Step 3 in our sequential approach presents the coding and analysis of interview data. Our interview data are broad, but in this context the analysis focuses specifically on what insights they offer regarding opportunities for and barriers to learning with children and grandchildren as warm experts. What ideas for statistical analysis can be derived for further analysis?

Drawing on insights from the interviews, step 4 operationalises opportunities for and barriers to learning and includes the designing of a survey. In order to allow for generalisation of the insights from our qualitative interviews, a postal survey is designed and sent to a simple random sample of 2,500 Swedish citizens aged 65–90.

Step 5 presents descriptive statistics from the survey. The statistics include insights into who the warm experts are, the frequency of family gatherings (meeting with potential warm experts) as well as the older adults' general perception of the quality of social support.

Step 6 develops the quantitative analysis using factor and regression analyses. The factor analysis identifies two factors in older adults' evaluation of their social support for learning – one positive and one negative. A subsequent regression analysis reveals how the evaluation of social support for learning varies between the groups of older adults.

RESULTS AND ANALYSIS

Step 1: Construction of interview guide drawing on the notion of warm experts

The interview guide was designed based on the overall aim to elicit the older adults' views and experiences of learning about digital media together with children and grandchildren. Here, it was especially important to understand whether interactions with children and grandchildren regarding digital media actually involved a learning process (Illeris, 2017), or whether the younger family members helped them solve technical issues without actually involving the older adults (Martínez & Olsson, 2022). Previous research on warm experts has not been clear about this difference, and not been specific about whether or not 'helping out' with digital media involves actual learning opportunities.

To gain insights into the older adults' experiences, the interview was designed as a semi-structured lifeworld interview based on Kvale and Brinkmann (2009), where the aim was to understand the nuances and lived experiences of everyday events (Martínez & Olsson, 2022). Several strategies were used to facilitate participants' memory, including asking about their current media use and how they started using this media, and conducting shorter follow-up interviews to ask about possible new learning events. Posing concrete questions about how they started using certain media devices or apps was particularly helpful in gaining insights into the support they were given. It was common that participants gave concrete examples of how learning events took place, or events where they received support without being given actual instruction. Participants often had their mobile phone or tablet at hand in the interview situation, which facilitated their memory about the array of apps they had access to and how they started using them (Martínez & Olsson, 2022).

The interview guide was also designed to capture differences in learning from different groups of people, with a focus on children and grandchildren. For instance, to aid participants in thinking about potential differences, the following question was asked: Are there any differences concerning learning together with children compared to grandchildren? These kinds of specific question were posed to support memory and to obtain nuanced descriptions of real-life events (Kvale & Brinkmann, 2009). To gain contextual understanding of the older adults' everyday lives and their relationships with family members, initial questions were also asked about the children and grandchildren they had and where they lived. Additional information about their family context often surfaced throughout the interview when they talked about which family members they learned about digital media together with, and which not, and what factors contributed to the involvement of certain warm experts (geographical distance, meeting patterns, teaching style etc).

Step 2: Selection of interviewees and interview procedures

The aim in the sampling process was to include participants with different ages, genders and socio-economic backgrounds. Participants needed to have some form of experience of learning about digital media together with their children or grandchildren, and this was stated in the information sheet provided during the recruitment process. As a result of the selection process, the interview study included 22 individuals aged 70 to 94 (9 men and 13 women). As stated above, follow-up interviews were conducted after the initial in-depth interviews.

All the interviews were individual interviews, except for one which included a couple. The interviews took place in the homes of the participants or in community centres for older

adults in the south of Sweden (Martínez & Olsson, 2022). Participants could choose the location and time that suited them best, and the interviews were performed with the aim of promoting a friendly environment in which participants were given space to engage in small talk before and after the conducting of the interview. Participants were provided with information about the study both verbally and through an information sheet, via which they also gave their informed consent. The interviews were audio recorded and transcribed verbatim.

Step 3: Analysis of the interview data

The interviews were analysed based on Knud Illeris' theory about the fundamental structures of learning (Illeris, 2017, Martínez & Olsson, 2022). First, the analysis distinguished between the two levels of the interaction process that shape the learning situation, namely the societal level and the close social interaction level (Illeris, 2017). The societal level concerns the opportunities for and barriers to learning between generations relating to societal and cultural norms and conditions, for instance that older adults in North European countries usually do not live in multigenerational households (Martínez & Olsson, 2022). The close social interaction level concerns opportunities for and barriers to learning between generations when meeting face-to-face or interacting through mediated communication. Here, the level of *involvement* in the situation shaped the possibilities for learning, for instance being able to see the screen or practice oneself when the warm expert is performing a task related to digital media. Involvement is fundamental for learning to take place, and can range from mere *perception*, where the individual picks up on bits of information, to participation, where there is joint activity in which the parties are engaged in performing goal-directed activities (Illeris, 2017). Hence, if warm experts solve technical issues without involving the older adults in an effective way, this hinders possibilities for learning.

The analysis focused on mapping the older adults' experiences of various barriers to and opportunities for learning related to the societal level and the close social interaction level, using qualitative coding in NVivo. In relation to the societal level, the analysis showed that living close to children and grandchildren and the possibility to meet regularly functioned as an opportunity for learning, as this facilitated the establishment of learning situations. Learning primarily occurred through face-to-face interactions rather than digital media like telephone calls. Hence, learning with children and grandchildren had a clear embodied dimension, grounded in physical presence and shared experiences.

However, the younger generation's life circumstances, often involving a busy everyday life, served as a hinder for creating learning situations, as they could have a lack of time to meet, or as the older adults did not want to bother their children and grandchildren with additional tasks and demands (Martínez & Olsson, 2022).

In relation to the close social interaction level, the analysis identified three overarching social situations where barriers to and opportunities for learning emerged: social situations of non-involvement, social situations of partial involvement and social situations of extensive involvement (Martínez & Olsson, 2022). In the first situation, concerning non-involvement, the warm experts helped the older adults but did not involve them in what they were actually doing – or the older adults did not want to be involved – which hence constituted a barrier to learning. In the second situation, regarding partial involvement, the older adults were

involved to some extent in the task related to digital media, but several different barriers to learning emerged. These included deficient communication from the younger generations, if they for instance spoke too fast or showed actions too fast on the screen. Deficient communication also concerned deficient explanations, if the warm expert skipped key bits of information and steps in the instruction or used technical terms that the older adults did not understand (Martínez & Olsson, 2022).

However, in social situations of extensive involvement, the warm experts involved the older adults in ways that facilitated their learning. These situations were characterised by constructive communication where the warm experts gave clear and calm instructions, explaining step-by-step and providing all the relevant information. In addition to this, being able to test oneself was also considered important by the older adults for their learning (Martínez & Olsson, 2022).

The barriers to and opportunities for learning with warm experts identified in the analysis can be understood to be indicators of what constitutes good-quality and poor-quality learning situations. In learning situations with poor quality, the older adults' learning is hindered in several ways relating to the interaction with warm experts, with the character of the communication playing a fundamental role. Here, high speed and the misplaced use of language are important features of poor-quality learning. In contrast to this, in good-quality learning the interaction with warm experts facilitates learning, as the older adults are deeply involved in the situation at hand through the use of constructive communication and opportunities to try oneself. Here, low speed, relevant information shared step-by-step, and the possibility to practice constitute central elements of good-quality learning.

Step 4: Operationalisation and survey design

The findings on warm experts, and opportunities for and barriers to learning, guided the design of new survey items: a postal survey was distributed in late 2020 to a simple random sample of 2,500 people aged 65 to 90 living in Sweden. 1,610 questionnaires were returned, which is a gross response rate of 64.4 percent. The sample represents Sweden's older population fairly well in terms of gender, education, income, etc. (cf. Olsson & Viscovi, 2023).

In the questionnaire, we initially ask which people are engaged as warm experts – 'child(ren)', 'friends/acquaintances', 'grandchild(ren)', 'partner', 'relatives', 'other' or 'no one to ask' – and whether it is for technical support or more importantly, social support for learning (see Table 1). We also include 'internet' as being an important resource for technical support as well as learning. Furthermore, respondents are asked to report how often these warm experts are engaged. The measure is subjective with the options, 'very often', 'quite often', 'rarely', and 'never'. This primarily reflects the individual's self-assessed need for support and learning, but as we will see below, it seems to correlate with real frequency as the degree of involvement of warm experts correlates positively with the frequency of interaction (Table 2).

The questionnaire also includes an item on social interaction where the respondents report how often – 'every week', 'every month', 'a few times a year', 'less often', 'never' – they meet with 'family', 'relatives' and 'friends' respectively. In Swedish, family in this context means close family, i.e. usually children and grandchildren and possible great-grandchildren.

The items on quality of social support mainly emanate from the interviews described in Step 3, and to some extent from interviews with experienced instructors from SeniorNet, Sweden, who for many years have been involved in adult education on digital media (c.f. Olsson & Viscovi, 2019a). Instructions with a high level of quality, according to the interviewees, are characterised by being divided into clear steps, having a moderate pace, a low degree of difficult technical terms, and in addition giving the instructed person space to try for themselves. Such instructions, constitute opportunities for learning, and instructions with opposite properties constitute barriers.

In the questionnaire, respondents are therefore asked to answer the following: ‘When friends and family provide instructions, how do you think it works’: ‘Instructions are divided into clear steps’; ‘Instructions are too fast’; ‘They use words I do not understand’; ‘I get the opportunity to try myself’. In addition, respondents are asked to make a more general evaluation of the instructions: ‘I am encouraged to learn more’; ‘My confidence is growing’; ‘I do not learn much’. All with the options ‘very often’, ‘quite often’, ‘rarely’, and ‘never’.

These variables, and a statistically generalisable data set, enable analysis of who is engaged as warm experts (children, partners, etc.), and to what extent this is done for the purposes of technical support and learning. Furthermore, they enable analysis of whether a family’s frequency of socialising can be related to how often learning takes place and the perceived quality of social support for learning.

Step 5: Descriptive statistics

Warm experts are mainly found, as Comunello et al. (2017) states, in older adults’ networks of younger relatives, primarily children and grandchildren. The observations are supported by Table 1, below, which furthermore reveals that partners, friends and relatives in a broader sense are also engaged as warm experts.

Table 1. *Warm Experts Giving Technical and Social Support for Learning. Percent.*

	Technical	n	Learning	n
Child(ren)	53.0	1,135	53.0	1,133
Partner	27.3	1,058	23.1	1,036
Grandchild(ren)	17.7	1,039	19.2	1,033
Friends/acquaintances	11.9	1,016	15.1	1,009
Relatives	8.1	1,021	8.7	1,014
Other	2.9	1,017	0.8	1,007
No one to ask	6.9	1,008	7.5	997
Internet	33.2	1,035	30.1	1,025

Note. The table displays the responses ‘very often’ and ‘quite often’. It includes, here and hereafter only individuals with children.

Regardless of the purpose, technical support or social support for learning, the results are similar. First and foremost, children are engaged as warm experts: 53.0 percent in both cases. In second place, the internet, rather than warm experts, is consulted, and in third place partners, followed by, in descending order: grandchildren, friends, relatives and others. Finally, about 7.5 percent report they have no one to ask – even though they have children.

Table 1 clearly shows that the second generation, the children, are the most frequently consulted category for learning, as well as technical support, and therefore occupy a unique position as warm experts. They constitute a conclusive social resource and opportunity for learning. In this regard, children are far more important than partners, at 23.1 percent, or grandchildren, at 19.2 percent.

For most older adults, it is closest at hand to ask their children, who by and large can be expected to feel responsible for their parents' well-being and can also be considered to be reliable. The children are furthermore usually old enough to be able to take on the role of teacher, and young enough to have comparatively better knowledge and digital skills than their parents. (Why grandchildren are not involved to the same degree as children can partly be explained by age. The oldest individuals have, on average, older grandchildren. A control for age reveals that, of the 80- to 84-year-olds, 27.6 percent report they involve grandchildren often or quite often. The corresponding figure for the 85- to 90-year-olds is 44.1 percent).

Furthermore, Barrantes Cáceres and Cozzubo Chaparro (2019), in a study conducted in three Latin American countries, find that 'the presence of minors in older adults' households encourages their access to the internet' (p. 263). In Sweden, it is quite unusual for adults over the age of 65 to live together with their children (only 5 to 6 percent, according to Statistics Sweden 2022, p. 19), but socialising between generations does of course not cease as a result of that, so in the Swedish context it is reasonable to assume that the frequency of family gatherings, the level of interaction, is an important factor regarding opportunities for learning and engaging warm experts.

Table 2. Frequency of Family Gatherings and Social Support for Learning. Percent.

	Every week	Every month	Less often	n
Child(ren)	60.3	49.8***	36.9***	1,093
Partner	23.1	23.9	22.8	1,002
Grandchildren	22.6	18.7	9.9***	999
Friend/acquaintance	14.2	15.5	16.4	975
Relatives	9.6	8.8	3.4**	982
Other	1.1	0.4	1.5	977
No one to ask	4.9	6.8	14.0***	968
Internet	29.4	31.3	32.0	992

Note. The table displays the responses 'very often' and 'quite often'. Chi-Square: * $p < .05$. ** $p < .01$. *** $p < .001$.

This assumption is supported by Table 2, as 60.3 percent of parents who meet with their family every week report that they engage their children as warm experts for learning often or quite often. Parents who meet their family every month tend to consult them to a slightly lower degree, at 49.8 percent. And finally, those with sparser interaction are noted for an even lower level, 36.9 percent.

A somewhat similar pattern exists for the involvement of grandchildren and other relatives; less socialising with family correlates with reduced provision of warm expertise from grandchildren and forms a descending pattern: 22.6 and 18.7 and 9.9 percent.

It is also worth noting that usage of the internet for learning remains constant, at about 30 percent, irrespective of the extent of the contact with family and children. This finding underlines the importance of face-to-face communication and more tangible assistance in these matters. Furthermore, less socialising with family and children does not correlate to a higher engagement of partners and friends; alternative resources do not seem to compensate for sparser interaction with children. Thus, sparser socialising with families generally means fewer opportunities for learning. This interpretation is reinforced by the fact that individuals who have very limited contact with their children are those who most often lack someone to ask, 14.0 percent.

How do older adults assess or perceive the quality of the support for learning?

Table 3. Quality of Social Support for Learning. Percent.

	Percent	n
I get the opportunity to try myself	72.7	1,085
I am encouraged to learn more	58.6	1,077
My confidence is growing	57.7	1,065
Instructions are divided into clear steps	44.2	1,033
Instructions are too fast	48.4	1,096
They use words I do not understand	35.6	1,053
I do not learn much	26.2	1,173

Note. The table displays the responses ‘very often’ and ‘quite often’.

A clear majority, 72.7 percent, report they are given the opportunity to try by themselves. Nearly 6 out of 10, 58.6 percent, are encouraged to learn more, and 57.7 percent gain more confidence. 44.2 percent state that the instructions are divided into clear steps. Furthermore, nearly every other, 48.4 percent, report that the instructions are given too fast, and one third, 35.6 percent, find the terminology that is used difficult to understand. Finally, 26.2 percent state that they do not learn much.

The overall impression—despite the fact that as many as 72.7 percent have the opportunity to try on their own and language is a concern for only a third—is that far from everyone is satisfied with the instructions they receive from warm experts. Just over 40 percent are *not* encouraged to learn more, and a majority believes that the instructions are *not* divided into clear steps. In other words, engaging a warm expert is not necessarily an opportunity for learning, as the quality must also reach a satisfactory level.

Can the frequency of family gatherings influence the quality of support?

Table 4. Frequency of Family Gatherings and Quality of Social Support for Learning. Percent.

	Every week	Every month	Less often	n
I get the opportunity to try myself	76.3	73.2	63.9***	1,046
I am encouraged to learn more	61.2	61.1	45.9***	1,036
My confidence is growing	60.8	60.7	47.1 ***	1,029
Instructions are divided into clear steps	46.6	43.4	38.2 ns	1,004
Instructions are too fast	49.1	50.1	41.6*	1,058

They use words I do not understand	34.5	39.1	33.2 ns	1,018
I do not learn much	26.3	23.4	29.7 ns	1,013

*Note. Chi-Square: as the figures for 'every week' and 'every month' are very similar, the test compares the sum of 'every week' plus 'every month' with 'less often'. * $p < .05$. ** $p < .01$. *** $p < .001$.*

Table 4 reveals that self-reported quality correlates somewhat with the frequency of family gatherings. Whether the gatherings take place weekly or monthly does not seem to matter in this regard, but the latter can be considered to be a threshold value: those who see their families and children less often than once a month deviate, as they are less satisfied overall with the support they receive. They do not try themselves as often (63.9 percent compared to roughly 70 percent), are not encouraged to learn to the same extent (45.9 percent compared to approximately 60 percent), and are not given the same degree of confidence (47.1 percent compared to approximately 60 percent). Admittedly, those with more frequent gatherings find that instructions are too fast to a slightly higher degree (50.1 percent compared to 41.6), but apart from that there are no significant differences.

So far, our results indicate that with regular contact, at least monthly, with family and children, the social support for learning occurs more frequently and is valued qualitatively higher by the recipients.

Step 6: Factor and regression analysis

However, not even regular access to warm experts seems to guarantee a high level of involvement and support of satisfactory quality. At best, the items in Table 4 result in 60 to 70 percent contentment, sometimes only 50 percent or even less. This deserves further attention, as a factor analysis, displayed in Table 5.

Table 5. Quality of Social Support for Learning. Factor Analysis.

	Factor 1	Factor 2
I get the opportunity to try myself	.843	.039
I am encouraged to learn more	.834	.089
My confidence is growing	.849	.017
Instructions are divided into clear steps	.773	.039
Instructions are too fast	.045	.841
They use words I do not understand	.096	.848
I do not learn much	.001	.721
Explained variance	40%	27%
Eigenvalues	2.82	1.87

Note. Principal component analysis, varimax with Kaiser normalisation.

The seven items measuring quality of social support form two factors. The sample is thus divided into two separate groups, with varying conceptions of the quality of support. Factor 1 consists of positive evaluations and experiences. For this group, the support can be regarded as opportunities for learning. Factor 2, on the other hand, has a higher degree of negative evaluations, thus indicating the opposite, i.e. barriers to learning.

Are there any differences between the two groups in terms of gender, age, education, resources etc.? On the one hand, it could be assumed that comparatively younger individuals, with longer formal education and computer experience from working life, would be better equipped to ask relevant questions and comprehend instructions from warm experts, and therefore benefit in that regard (c.f. Courtois and Verdegem 2016; van Dijk 2020). On the other hand, it could be the other way around. Helsper & van Deursen (2017, p. 710) explicitly rejects the hypothesis that: ‘The more socio-economic resources (i.e., education, income, employment, and health) one has, the higher the quality of support ...’. A linear regression analysis, where the two factors form two different indices, might shed some light on the matter.

The first one, an Opportunity Index, constructed from factor 1, has a Cronbach’s Alpha value of 0.87. The second, a Barrier Index from factor 2, has a value of 0.75. This confirms that the variables measuring social quality of support are theoretically consistent and therefore suitable for index construction. The indices in Table 5 vary between 5 and 20; the higher the value in the Opportunity Index, the more positive the experiences, the higher the value in the Barrier Index, the more negative the experiences.

Table 6. Opportunity Index and Barrier Index. Linear Regression Analysis.

	Opportunity Index				Barrier Index			
	B	S.E.	β	Sign	B	S.E.	β	Sign
(Male) Female	.892	.251	.129	***	-.645	.245	-.097	***
Age	-.042	.023	-.066		-.018	.022	-.029	
Education								
(Short) Middle, Long	.588	.334	.068		.318	.324	.038	
(Short, Middle) Long	.521	.275	.074		.185	.268	.027	
Computer experience	.090	.273	.012		1.395	.268	.197	***
Income, SEK*)								
(0-300 000) 301,000–	.531	.319	.071		.068	.312	.009	
(0-600 000) 601,000 –	.475	.315	.058		.331	.306	.042	
(Single) Couple	.268	.348	.032		-.357	.339	-.044	
Association membership								
(Non-member) Member	-.007	.258	-.001		.038	.251	.006	
Family gatherings								
(Less often) Every week	.226	.289	.033		.307	.282	.046	
(Less often) Every month	1.059	.354	.125	**	-.384	.346	-.047	
Constant	13.008	1.806		***	14.331	1.749		***
Adjusted R²				.065				.058

Note. *) SEK = Swedish krona. * $p < .05$. ** $p < .01$. *** $p < .001$.

The most tangible finding when analysing opportunities for learning is that characteristics and capacities that are usually strongly connected to access, usage and outcomes of digital media – such as age, experience of computers from working life, education (Friemel 2016; van Dijk 2020; Olsson & Viscovi, 2020) – have no significant impact on the reported quality of warm expertise.

The only significant factors are gender, women have more positive experiences than men (β .129), and socializing with family (β .125). Women in general tend to take more initiative than men for family gatherings, and for having a closer relationship with their adult children (Ahlberg et al., 2008). It is therefore probably no coincidence that women are slightly more satisfied than men overall in this regard.

This interpretation is strengthened in the second index, which exhibits an opposite correlation. Women have fewer negative experiences than men (β -.097).

A somewhat intriguing finding is that computer experience can be related to negative experiences, and not vice versa. However, the finding is in line with what Helsper and van Deursen (2017, p. 711) already stated: ‘... the more skilled one is, the less happy one is with the received support.’ A plausible interpretation is that more skilled users, require a higher level of support for learning, which the warm expert cannot always meet.

DISCUSSION

In this paper, we started by pointing out a research gap, namely warm experts and the extent to which warm experts *provide sustainable opportunities and support for older adults’ learning*. We further argued that this aim calls for a sequential exploratory mixed-methods design in 6 steps.

When extant research is sparse, it is fruitful to start with a qualitative method and broad explorative approach, both in terms of interviewees and themes. Thus, Step 1 involved the construction of an interview guide, informed by Illeris’ (2017) notions of opportunities for and barriers to learning. In Step 2, 22 individuals aged between 70 and 94, with varying socio-economic backgrounds, were selected and interviewed about their everyday encounters with digital media, and gradually more about the role of their children and grandchildren as warm experts providing support for learning. These measures enabled a theoretically informed analysis in Step 3 that, on the one hand, revealed the warm experts’ crucial role for older individuals’ learning of digital media, and on the other hand, the importance of involvement and regular interaction—and instructions with specific characteristics. Avoidance of difficult words, comfortable pace, etc. were found to provide *opportunities for learning*, whereas sporadic interaction and rushed instructions with numerous technical terms are *barriers to learning*.

In Step 4, these variations regarding quantity and quality of social support were operationalised into survey items that enabled the measurement of who are engaged as warm experts, to what extent and how the quality is perceived by the recipients. In Step 5, a representative sample of Sweden’s elderly population between the ages of 65 and 90 allowed for statistical analysis and statistical generalization. Through this, we were able to establish that one’s own children are the most common warm expert, rather than grandchildren or partner, and that there is a positive correlation, quantitatively as well as qualitatively, between family gatherings and social support for learning.

In Step 6 a factor analysis of the quality of support substantiated the operationalisation of the findings in Step 3, and furthermore revealed that the sample is divided into two groups, with opposite perceptions of the quality of support. The construction of two indices, with satisfactory Cronbach’s Alpha coefficients, provided further support for theoretical

consistency in this regard. Finally, a multiple regression analysis was conducted that, first and foremost, confirmed that frequent socialising with family promotes the quality of support, and, somewhat surprisingly, that socio-economic factors such as age, education, income etc. have limited impact on the perceived quality of warm expertise.

As also stated above, there is a lack of research on the quality of social support for learning about digital media. However, an important exception is Helsper and Van Deursen (2017) focusing on the quality and quantity of social support for digital engagement. Their study focuses on learning to some extent by asking respondents ‘who received support in the past three months whether they felt they would still need support the next time in a similar occurrence’ (Helsper & Van Deursen, 2017, p. 706). The assumption made in this question is that the support was successful if recipients managed to solve problems on their own the next time. Our investigation extends this study in the sense that it aims to cover additional aspects. Hence, our study makes an original contribution to existing research on warm experts by developing a multifaceted instrument for measuring self-reported experiences regarding quality of social support for learning. Our items have a high level of validity as they are based on a research design using learning theory (Illeris, 2017) and qualitative in-depth interviews. This instrument could be used in future studies to further test its relevance and gain better insights into the complexities of social support for learning in various contexts.

However, there are limitations connected to the present research design. The advantages of mixed methods can from another perspective be seen as a disadvantage. With two different methods and two different materials – reported within the framework and word limits of a scientific journal – details and variations cannot be reported as extensively as in conventional studies. There is a risk of leaving both quantitatively and qualitatively oriented researchers unsatisfied, and with modest impact as a possible consequence.

CONCLUSION

Digital divides and socio-economic inequality are well covered by research; access, usage and outcomes vary widely among younger individuals as well as older people (van Dijk 2020; Friemel, 2016; Llorente-Barroso et al., 2023). This study highlights yet another unevenly distributed component or aspect, which is warm experts and social support for learning. Above, we have seen that those who receive regular, high-quality support have opportunities. Others have to settle for sporadic support of lower quality—and still others have no warm experts to engage at all. Thus, even when taking informal learning and support within families into account, digital divides remain.

Our findings have policy implications. In 2030, it is assumed that almost 30 percent, or 3 million, of Sweden's population of 10 million will be 60 or older (Statistics Sweden, 2022). Increased digitalisation and the strategy Digital First are ways to meet this demographic change and the coming challenges for the welfare state. However, without knowledge of users’ specific starting situations, the strategy risks contributing to rather than reducing inequality and thereby counteracting the compensatory functions of welfare policy.

Digitalisation gives individuals opportunities but also makes demands. It requires lifelong learning in the true sense of the term, i.e. long after working life has ended. The absence of standardisation and stability in this area is palpable: the lifecycles of devices are

short and usage skills have to continuously be re-acquired and re-learned. The interfaces of platforms and applications are even more inconsistent. Despite this, Sweden, like almost all countries, has not created a well-developed system for education and training in parallel with the digital expansion. Individuals must rely mainly on their own abilities and resources within the family. This will most likely not contribute to a more equal distribution of welfare and social rights.

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Human Technology

ISSN 1795-6889

<https://ht.csr-pub.eu>