

Digital Competences and Digital Life in the Post Pandemic World

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Abstract

The authors of this paper are bringing a fresh look on the challenges and opportunities for the tech companies and the technical education institutions in the aftermath of the COVID-19 pandemic and the impact that this event had on the society on a global scale, for all demographic categories. As being the first pandemic, which had to be faced by the “digitized society”, during two or so years of physical distancing various challenges have arisen for our highly interconnected fast-paced and dynamic world, but in an equal manner, several opportunities and revelations were discovered amid the necessary sanitary measures. This material aims to highlight both the strong points and the weak points that our society has shown during the last few years, but also the highly interesting social and psychological studies resulted after these events.

Keywords: digitalization, digital skills, pandemic, post pandemic world, work from home, remote work, work-life balance, online classes, online learning, social issues, senior citizens care, elder care, psychological effects, psychology, lessons learned.

Keywords: Video games, human mind

1 Do you remember the last great pandemic?

Most probably not, unless you are a senior citizen or are lucky enough to still have your grandparents alive to tell you, their stories. We, the authors, sure cannot remember the last great pandemic that made millions of victims worldwide because of the simple reason that it happened long before we were born, more exactly during the dark times of the First World War. This misnamed “Spanish Flu” (which didn’t originate in Spain, but this misnomer stuck in the collective mind) went on from 1918 to 1920 was officially named “The Great Influenza Pandemic” and affected nearly a third of the global population, or approximatively 500 million people during its four waves. Estimates of deaths range from 17 million to 50 million, and possibly as high as 100 million, making it one of the deadliest pandemics in history. [1-Wikipedia]. This wide range in estimations and inaccurate data sound quite different from the rigorous and precise information we have today regarding such statistics and measurements, and this gap of information is given by the digitalization of our life and society.

But even if we come closer to the present and we mention the “Asian Flu” from 1957 and the later “Flu Pandemic” from 1968, a comparison between our society from those times and our society from now will show us not only how much we have changed, but how adaptive we have become and how our evolution, discoveries and

technologies allowed us to overcome and *tame* natural threats. Because let's be honest, unless you were a craftsman or a trader that had your workplace somewhere in the premises of your propriety, there was not any real chance to "work from home" in the '20s, '50s or '60s.

Therefore, having the opportunity of working or studying from home (or from anywhere), a novelty for us today (especially after two years of limitations, curfews, social distancing, and so on) would have not even been an option for the people of just one generation ago. Moreover, this "novelty" is possible because of the omnipresent digitalization that took place in the last decades. However, didn't we forget anything along the way and is it really just a "success story"?

2. Working from home, from anywhere, from everywhere

How many of us would have thought a few years ago that "remote-working" (or however you want to call the act of working at your job from somewhere else except your employer's location) will be not only a common thing but almost a mandatory part of today's job offers? In our fully interconnected world, where over 5 billion people (or 63.1% of global population) have access to an internet connection, it has become almost mandatory for the employers, in case their activity implies a "desk job", to mention that "remote work" would be possible. This very concept of working from somewhere else besides your usual desk was seen as a pioneering move before the COVID-19 pandemic, almost as equally revolutionary as the idea to have only 4 working days per week. It took us a global pandemic to make the shift and to convert an experimental idea to a fact: on a side note, let's hope we won't need another pandemic to make the shift to the four-day work week.

With this shift, the labor market changed forever and employees now expect, at least occasionally, the option to work from somewhere else outside of the office space. Employers that do not offer this option (even though they could) might lose valuable human resources and even Forbes declared that "remote work is no longer a privilege". Meanwhile, some employers went all-in with the concept of remote work, hiring and forming entirely online teams and departments that are spread over several cities, regions or even countries, without having a "central location" of their activity. By all means, this is literally, breaking the boundaries of what is considered the work environment. However, as several studies have shown, working entirely from home, or to put it in another way, working completely separated from your colleagues does not have only "pros" but - almost in an equal quantity - its "cons".

Generally speaking, "remote work" usually implies working from home and, according to several studies, employees that had this opportunity reported that they feel less stressed during working hours, have increased productivity (surprising, especially for employers who always associated remote work with reduced productivity and reduced input from their staff), managed to meet deadlines more easily and generally, had a better work-life balance.

On an individual level, each person might have (slightly) different feelings about performing work from some other location rather than the office, but on a macro level, statistics point out to the fact that working from home has benefits, like:

- No commute: whether it takes 10 minutes to drive to work or 1 hour, it saves this time when working from home. Employees can start the workday earlier if they

do not have to take the time to drive into the office. The amount of time saved differs greatly from region to region and has many factors, but doubtless, time is saved by not commuting to work, not to mention the positive ecological impact of not using a personal vehicle for daily commute

- More time for hobbies and other personal-time activities: basically, a gold mine in regard to timesaving, for people that want to maintain a decent work-life balance;
- More time for healthy habits, fostering them, and including them in the routine: like exercising, walking, jogging, etc.

According to the Office for National Statistics – Opinions and Lifestyle Survey, in Great Britain the proportion of homeworkers planning to work mostly from home rose with 12% between April 2021 and February 2022

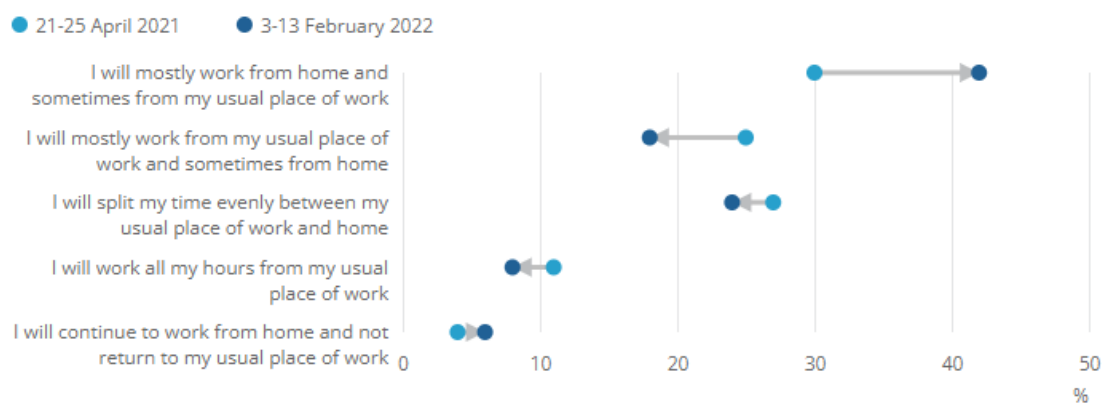


Figure 1 Opinions and Lifestyle Survey

The same study shows that, the main reason organizations chose to use or are planning to use, homeworking permanently is for improved staff well-being. The other positions that fill up the top-three reasons are represented by reduced overheads and increased productivity. What is interesting to see is that reduced carbon-emissions and the ability to recruit from a wider geographic area, even though are situated near the top, did not make the “podium” of this classification. Also, the health concerns are far from the main reasons: this shows that, at least for the organizations that took part of this survey, giving the options to employees to “work from home” was a reactive decision which addressed immediate concerns about their current team members, so their decision was not taken for a growth purpose or a long-term plan to extend their operations in a wider geographical area, but rather just for the immediate incentives offered or at least proposed to their current organization. The data is taken in UK from 4th to 17th of April 2022

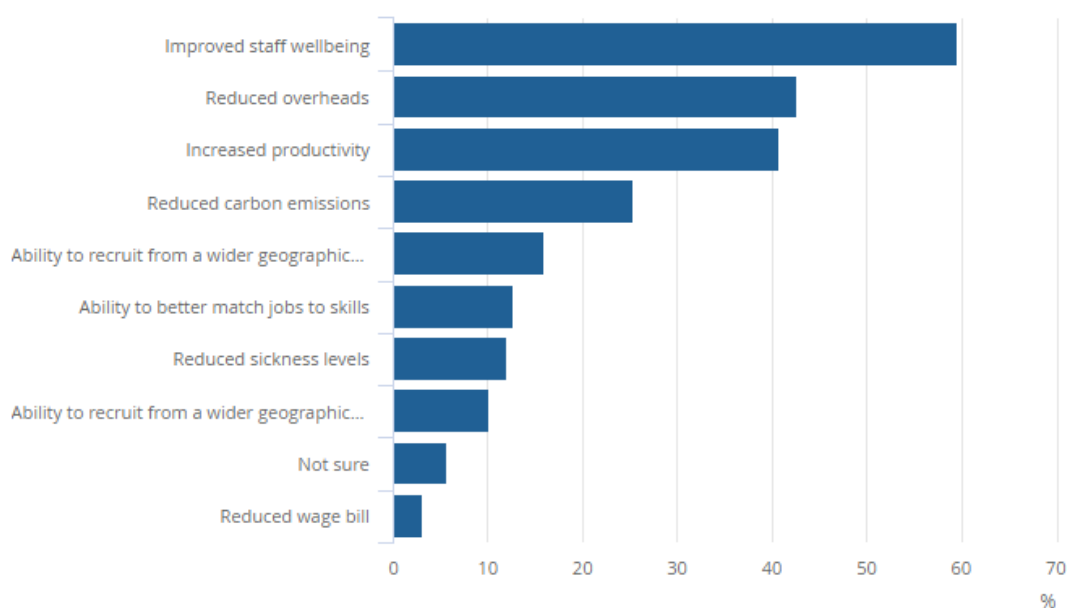


Figure 2 Source: Office for National Statistics – Opinions and Lifestyle Survey

On the other way around, the same studies point out that, with all the pros of working from home, unfortunately there are almost as many cons, the most highly noticed aspects being:

- Lack of social interaction and loneliness (lack of human interaction can be dangerous for the mental health): The American Psychiatric Association completed a survey last year (in 2021) that revealed remote workers often suffer from isolation and loneliness: their conclusion: nearly 2/3 of people working from home feel isolated or lonely at least sometimes and 17% do that all the time;
- Communication challenges and lack of motivation: Connecting with like-minded colleagues can encourage employees to share ideas and push them to set and achieve career goals. However, due to decreased social interaction, employees might lose motivation more quickly than when working in an office. In addition, without a manager physically present, it can be more challenging for employees to spark some motivation among themselves.
- Either home interruptions or overworking and the inability and mistake to “forget” to stop working when the business-day ended, or the inability to separate work from home (because literally the two “worlds” took up the same physical space).

One of the most surprising side effects was the claim of increased loneliness and isolation while working from home. It might sound surprising, given at least the dozen or so channels that we have at our fingertips to communicate and socialize with other persons: we humans are social creatures who thrive on interactions with others after all. Nevertheless, if we are denied these social interactions, by social-distancing laws, for example, our mental health suffers. Similarly, interactions with other people are key aspects of many modern jobs. Whether collaborating on projects, discussing strategies, planning constructions, presenting information, dealing with medical emergencies or getting constructive feedback as part of your development, it is vanishingly rare that a worker can do their job with no involvement from anyone.

A major study published in Nature Human Behavior in September 2021 revealed that when 60,000+ Microsoft employees worked remotely during the

pandemic, communication between employees and groups slowed down, and became more formulaic and self-contained. Other studies show that team performance is reduced when some or all members work remotely.

Humans have spent millions of years communicating face-to-face, and as far as our brains are concerned, modern technology, however advanced and sophisticated, still cannot faithfully replicate all the rich and subtle cues it involves. While things like social media can help with loneliness, they can't alleviate it entirely.

Moreover, according to Stanford University survey carried out between May 21st-25th 2020 and consisting of 2,500 US residents aged 20 to 64 it seems that working from home while under the COVID-19 pandemic had also some challenges for the employees themselves: only 49% of the respondents declared that they work from a room which is their own and it's not a bedroom.

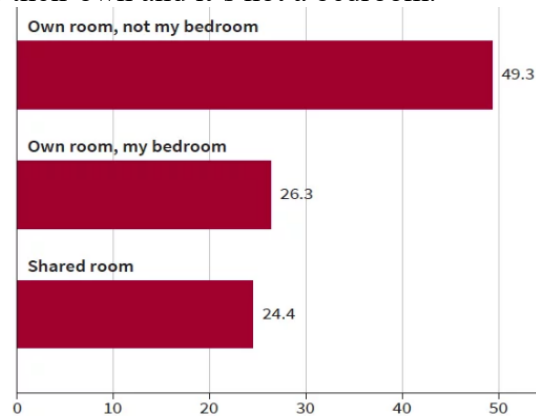


Figure 3 Source: Stanford University Survey

Coming back to the data provided by the Office for National Statistics, the percentage of people working exclusively from home fell from 22% to 14% from February to May 2022. In the same period, the proportion of hybrid workers has increased from 13% to 24%. This is another major indicator that full-time remote work is becoming increasingly unpopular.

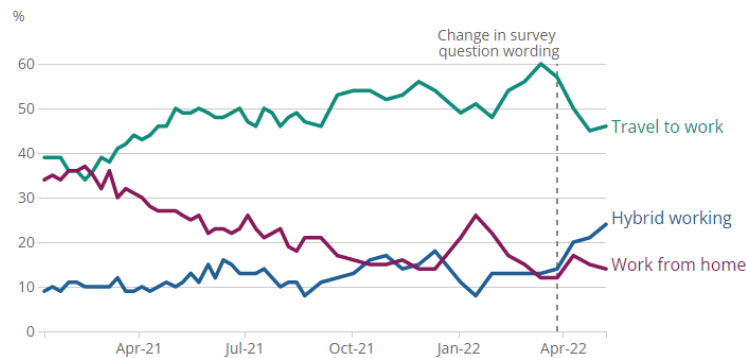


Figure 4 Source: Office for National Statistics – Opinions and Lifestyle Survey

Hybrid work models offer a blend of in-office and remote work and are likely to become permanent fixtures of how we work. Various studies have shown that hybrid working models offer the “best of both worlds” by contributing to a better work-life balance, a greater ability to focus, saved commuting times and costs and higher levels of motivation. Not only do hybrid work models offer benefits for employees, but they also offer advantages for companies by reducing estate and facilities costs. As is the case in most of our daily life, balance seems to be the

keyword. In addition, by promoting the hybrid work model, we might give a chance to the various (local) small businesses that exist and survive mainly because of the office workers, their shopping habits, their consuming habits and their routines.

3. Online classes and remote learning

The COVID-19 pandemic disrupted the world in ways unimaginable. As we look back on the past two years and the harsh repercussions of the pandemic that continue until today, it is apparent that one of the most impacted sectors was education. Neither the world nor educational institutions were prepared to embrace the shift to online platforms brought on at lightning speed. Education is complex and requires many components and successful learning is built on a foundation akin to Maslow's Hierarchy of Needs.

While the active population was bracing for the lockdown, wondering either how their daily work will be and look in the future (especially in case of jobs that couldn't be performed remotely) or where to set up their office at home, the youth was preparing for a whole new way of studying, in the form of online classes – given the maturity, social background, quality of the teaching process and quality of the educational system in their countries, remote learning was perceived either as a modern way to get formal education or an unexpected and unplanned vacation. And here we can approach probably the biggest problem of the social isolation and physical distancing that was both necessary and misfortunate during the peak years of the pandemic: the effect of this limitation on the psyche of children and youth. Because is one thing to affect (temporary or not) the performance and morale of adults – which are expected and should return from the discomfort of the isolation quick – and it's a whole other story when the same effects and rules are applied to young children, teenagers or young adults.

Yes, they are tech-savvy, yes they have dozens of social networks, yes many of them already preferred the quiet and comfort of their room, but most of the national education systems are left behind, follow a very old methodology and fail to adapt to the needs of the “21st Century student”, that is why our opinion is that little consideration or thought was given by the authorities to the psychological effects of having an entire generation of students studying from home. It is completely clear that due to the sanitary restrictions, lessons and courses could not be held “face to face”, but unfortunately, little was done to mitigate the huge gap that formed between the school years that we knew and grew up with and the school years that were online.

And there are also the delicate problems of children that could not afford any kind of digital gadget that would allow them to join the “online classroom” or couldn't afford an internet connection subscription and the lack of digital skills and general technical know-how of some teachers that were not able to use the services and infrastructure offered by the IT industry.

Educational institutions worldwide promptly responded to the pandemic by going online. In record time, students moved from physical spaces that provided them with much-needed social interactions, to being seated behind a screen for hours on end. Despite heightened disengagement levels due to the loss of social interactions (especially amongst younger children), research studies and various surveys show that students did learn new skills, such as time management and responsibility.

Even so, United Nations shown that close to 1.6 billion young students from 186 countries were out of school in the peak-waves, that being more than 91 percent of the students worldwide, and many experts believe that the pandemic's impact on education will continue long after it's official ending.

The effectiveness of online learning is still the subject of debate. Experts have been studying the retention of information by students and how remote learning has affected the development and social skills of children. They conclude that online learning's effectiveness is dependent on the following three conditions:

- Students having consistent access to the internet and computers;
- Teachers receiving the needed training to administer courses online;
- Platforms that provide personalized learning, to match the journey of each individual student



35% of primary schools lack basic handwashing facilities

Source: UN Sustainable Development Goals Report 2020



500 Million students are out of reach of remote learning

Source: UN Sustainable Development Goals Report 2020

However, education is not an easy task, online or not. The UN Sustainable Development Goals, a blueprint for creating a more just world, has named “quality education” as its fourth goal. One target of that goal is ensuring that by 2030, all children have the means to complete a “free, equitable, and quality primary and secondary education.” Their goal is extremely ambitious since educating children is far more complex than just getting them into a classroom. Are the teachers regularly trained? Do the children have access to proper nutrition? Are they physically healthy and well enough to learn? Does the school have adequate sanitation? Is there a safe, reliable way for teachers and children to get to school? Are there issues at home? Can parents help with homework? Does the family's need for income mean the child is working instead of being at school?

Even though before COVID-19, there was already high growth and adoption in education technology, with global “edtech” investments reaching US\$18.66 billion in 2019 and the overall market for online education projected to reach \$350 Billion by 2025.

While some believe that the unplanned and rapid move to online learning – with no training, insufficient bandwidth, and little preparation – resulted in a poor user experience that is uncondusive to sustained growth, others believe that a lesson to be learned from this experience is that the new hybrid model of education will emerge, with significant benefits, mapping closely the trends that seem to take shape in the business world. And making the hybrid school a feasible program will have however, many challenges to overcome. Some students without reliable internet access and/or technology struggle to participate in digital learning - this gap is seen across countries and between income brackets within countries. For example, whilst 95% of students in Switzerland, Norway, and Austria have a computer to use for their schoolwork, only 34% in Indonesia do, according to OECD data. In the US, there is a significant gap between those from privileged and disadvantaged backgrounds: whilst virtually all 15-year-olds from a privileged background said they had a computer to work on,

nearly 25% of those from disadvantaged backgrounds did not. While some schools and governments have been providing digital equipment to students in need many are still concerned that the pandemic will widen the digital divide.

Nevertheless, the effectiveness of online learning varies amongst age groups. The general consensus on children, especially younger ones, is that a structured environment is required, because kids are more easily distracted. To get the full benefit of online learning, there needs to be a concerted effort to provide this structure and go beyond replicating a physical class/lecture through video capabilities, instead, using a range of collaboration tools and engagement methods that promote “inclusion, personalization and intelligence.

It is clear that the pandemic has disrupted an education system that many assert was already losing its relevance, considering – mainly with solid arguments – that schools continue to focus on traditional academic skills and repetition-learning (memorizing) rather than on skills such as critical thinking and adaptability, which will be more important for success in the future. Could the move to online learning be the catalyst to create a new, more effective method of educating students and are the teachers ready for this change?

We should use this opportunity and lean into developing teachers in new ways we haven't thought of before: we can't just assume that if we give them a tablet and instructions, they are going to know how to use it, and we shouldn't expect they are going to know how to effectively teach children with it. Because the teaching process has to take care not only about the student's need and expectations, but also about the teacher's wellbeing: and we think anyone who needed to present something via an online tool to an audience, knows the feeling when nobody is paying attention and no feedback is given, where the interaction with your audience is limited by the digital screen of whatever gadget is used and by the various props and gimmicks offered by the many online-meeting platforms.

4. Did we forget someone?

So, do you remember the first pandemic, now? Still, neither do we, but if you will remember, at the very beginning we mentioned that, given how fortunate we are, we could still have our grandparents alive to tell us their tales of the past. What about them in the pandemic and post-pandemic world? What authorities spent time (and how much?) in preparing and educating the seniors and elders for the “x-th” digital revolution? *By this point, we lost count on how many digital revolutions we had so we just prefer to write it down with the “x” letter.*

Regardless of the technicality of numbering digital revolutions, one of the most vulnerable demographics was left out and forgotten when the almost instant migration to the online environment was triggered by the lockdowns. As usual, authorities couldn't take into consideration all of the branching challenges that came together with the imposed restrictions and so, the seniors, which are, without any doubt, the most in need of receiving services and care, found themselves “without connection” in the “remote-connected” world.

A study conducted by “Age UK” – which is UK's leading charity dedicated to helping the elderly – shown that 25 percent of people aged 65 and over in the UK don't use the internet. Older people who are without digital skills risk losing access to key services such as banking, shopping, and health services, as well as

communications platforms that keep people connected. They are also the ones that were the most affected by the pandemic lockdowns. Many older people lack sufficient digital literacy and face the risk of being excluded from most of society's services

The same research found that, in England, the three most common reasons for people aged 65 and over not using the internet were:

- A lack of skills;
- A lack of trust in the internet;
- A lack of access to good enough equipment and/or broadband access.

Although the share of older people who use the internet has increased steadily in many Western countries (Eurostat, 2020), older people are still among the largest group affected by digital inequalities. Granted, it would be wrong to portray the older population as a monolithic block of techno-phobic and digitally incompetent people. As a society, we are encouraged to believe that more people than ever are technologically literate and connected through an array of smart devices on a daily basis. Particularly during the pandemic, it appeared as if everyone was online and learning new digital abilities by the minute.

However, we cannot ignore the fact there is (still) a vast amount of older people who involuntarily lack sufficient skills and confidence for adopting the digital technologies necessary to participate in society. Digital inclusion of older people has been recognized as a pressing issue on many fronts and has to go beyond merely providing the technological infrastructure. Acquisition of skills to use technology is equally important and informal support by family members, as essential it is for motivational and emotional reasons, cannot replace formal trainings.

That is where the support and involvement of educational institutions has to come into play: elementary schools, high schools and universities must work in close collaboration with the local authorities, with the central government, with NGO's and elder-care homes in order to develop digital-upskilling courses for the seniors: not only for allowing them to take advantage of the digitized environment and facilities, but in order to bring them together with us in the 21st Century.

Age UK's report bring more interesting details that confirm that the senior population needs basic education and forming for using digital items, be that smartphone, tablets or PCs. For example, only 46% of people 75 and over stated that they use the internet daily, while 42% of them said they are non-users.

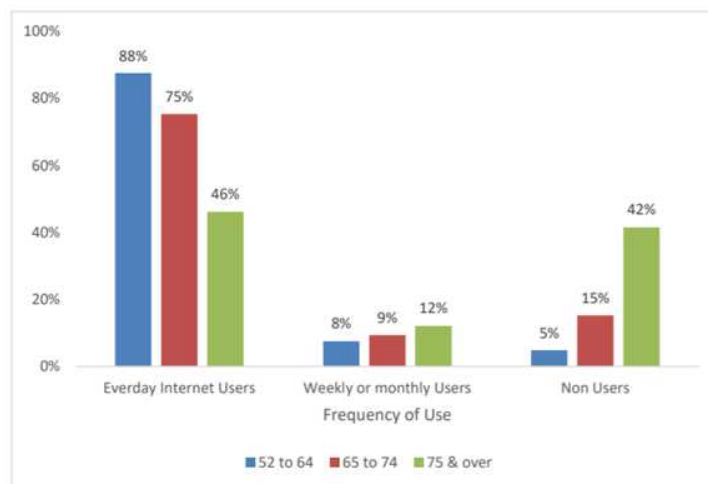


Figure 5

Why is this of concern? With the pandemic waves of 2020 and 2021, many businesses, public services and entertainment companies migrated their products, services and procedures online. Increasingly, people's social lives, leisure time, medical or health services and communication with loved ones have moved online. Without the appropriate aptitudes in digital technology, how can older people access these services to overcome the challenges of entering a completely new digital world? Again, this can be a chance for the educational institutions to step-in and cover the gap between the digital literacy of our generations.

For top digital skills for seniors to acquire, some of the most important, in our opinion, are:

- **Accessing Information:** Using a search engine to look for information, downloading and saving something discovered online;
- **Communication:** Creating messages through messaging services and writing emails;
- **Transacting:** purchasing items or services online, such as banking and navigating apps;
- **Online banking:** With many high street branches closing down and cashpoints becoming fewer and far between, learning how to bank online and use banking information safely are vital competencies for older people;
- **Online Shopping:** Once an older person becomes more technologically competent, online shopping can be a lifesaver. Whether it's for food, groceries, health facilities or gifts for others, being able to buy what you want online and have it delivered to your door is convenient and easy once the skills have been developed;
- **Online Communication:** Communicating with loved ones is a crucial aspect of everyday life for a vast swathe of over-65 people. If it cannot be done in person, then seniors may begin to feel isolated if they do not have the necessary digital skills to connect with friends and family online.

The UK Consumer Digital Index of 2018 shown that 40% of all low-digital, low-financial capability adults were aged over 60, shining a light on the real need for an increased digital awareness in this age group. In the graph below, taken from the same source, the percentage of low digital, low financial capability adults are shown, split by age.

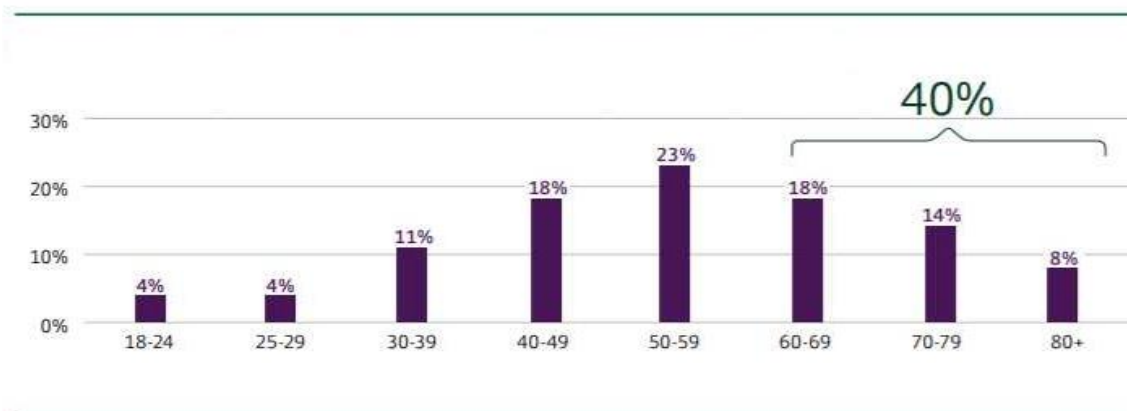


Figure 6

In truth, public services and businesses have started to become more aware of the lack of inclusion for older people in the digital landscape. As a result, many

charities and companies are offering accessible courses to teach seniors how to develop digital skills and apply these practically online.

This is the case only in the highly developed countries: the figures shown by these studies, surveys, statistics and analyses will be much worse if they would have been made in less developed countries or emergent economies. That is why, until NGOs and charities find the necessary resources to establish such courses for the elders, the already existing and acclaimed institutions must step in and contribute with their know-how and expertise.

5. Conclusions

After processing all the information, all the social and psychological studies that came after the unexpected and complex health situation worldwide, we can safely conclude that remote work and all which this implies has to be well balanced not only for the employees but also for the employers, according to the nature of the job performed. On a macro scale, hybrid work seems to be an optimal approach, but even so, in order to keep up with the modern times and the employees' expectations, organizations have to at least mention the option of having remote-work as part of their incentive package, even when remote-work might be tightly regulated or conditioned by their internal policies. At the same time, additional focus has to be placed on remote workers well-being.

Online school, even if it might be of great advantage for some student, especially if recorder courses are available, which student can watch and re-watch on demand, will always limit the interaction between young developing students and pupils, and this distancing is even more critical for younger children. A good approach might be to separate the online school program based on the level of education or the nature of the educational institution: preschoolers, elementary school children and middle school should be permanently on-site in schools, not only for more engagement with the classes but also for more social engagement, whilst higher educational levels might use an approach that combines online school and e-learning with on-site activities.

Last, but not least, the seniors and elderly need the support, understanding and involvement of the "digital generation" to feel included and part of the active society and for remaining significant for the society's progress. In other words, it should be our duty to make them feel included and relevant even though, our world probably moves too fast for what their accustomed to. They must be encouraged and mentored in using the digital tools at our disposal and the web and given their sometimes "difficult situation", maybe even offered a free internet subscription incentivized by the governments. We think here is a huge opportunity for tech companies, IT firms, authorities, and local institutions to have a major positive impact on the quality of life of the seniors if such programs will be created.

Therefore, in the end, what can we take of all this? To put it simply, however we look at the digital life in the post-pandemic world, balance is the key to a healthy living: being that balance between remote-work and on-site work, online schools and traditional schooling or social interactions and social isolation.

References

- [1] Bao, W. (2020). COVID-19 and online teaching in higher Education: A case of Peking University. Wiley Online Library,2(2),113-115
- [2] Zheleva M., Tramonti M., “Use of the Virtual World for Educational Purposes”, in Electronic Journal for Computer Science and Communications, n. Issue 4(2), Burgas Free University, pp. 106-125, 2015
- [3] Usoro, A., & Majewski, G. (2009). Measuring Quality e-Learning in Higher Education international Journal of Global Management Studies (2), 1-32
- [4] MacTeer, C. F. (2011). Distance education (Ser. Education in a competitive and globalizing world). Nova Science
- [5] Mustajab D., Bauw A., Rasyid A., Irawan A., Akbar M. A., & Hamid M. A. (2020). Working from home phenomenon as an effort to prevent COVID-19 attacks and its impacts on work productivity. The International Journal of Applied Business, 4(1), 13–21.
- [6] Mowday R. T., Porter L. W., & Steers R. M. (1982). Employee—Organization linkages: The psychology of commitment, absenteeism, and turnover. Academic Press.
- [7] Walker, A. A. (2017). Why education practitioners and stakeholders should care about person fit in educational assessments. Harvard Educational Review, 87(3), 426-443
- [8] N. Selwyn -The information aged: A qualitative study of older adults' use of information and communications technology Journal of Aging Studies (2004)
- [9] A. Blazic et al. Digital skills for elderly people: A learning experiment in four European Countries
- [10] Review of European Studies (2018)
- [12] ONS GOV UK
<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/ishybridworkingheretostay/2022-05-23>
- [13] Science Focus: <https://www.sciencefocus.com/science/are-you-better-off-working-from-home-heres-what-the-science-says/>
- [14] Stanford University : <https://siepr.stanford.edu/publications/policy-brief/how-working-home-works-out>