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Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings Technology in Use in COVID's Society. Learning from Failures

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CONTENTS

Abstracts

1. Introduction

2. Literature review

3. Objectives

4. Methodology

4.1 *Sample*

4.2 *Procedure*

5. Results and discussion

5.1 *Problems identified*

5.1.1 *On families*

5.1.2 *On social services*

5.1.3 *On education*

5.1.4 *On health*

5.2 *Conflicts for analysis (medium ground)*

5.2.1 *Thinking on the digital divide or in terms of social inequality and social cohesion?*

5.2.2 *Access, use and learning are not linear or even clear relations, but we act like that.*

5.2.3 *The mantra "make more courses" may not be working to increase digital competencies without applying them in their daily professional life.*

5.2.4 *Working versus Thinking. We can't think because we can't stop working, and that's a problem because we need to think for better action.*

6. Conclusions: some ideas to learn

6.1 *Thinking in terms of Double loop learning.*

6.2 *Learning to swim on the ethical flow*

6.3 *Discussing the problems of vulnerable people with vulnerable people.*

Bibliography

ABSTRACT (English)

In the intra and post-pandemic period there has been a phenomenon that has generated two parallel processes: on the one hand, it has equalized us all and, on the other, it has revealed to us how unequal we are (inequalities we suffer at the individual, collective and global level). Technology has not been left out of this phenomenon. Thanks to it, new connections and possibilities have been made possible (professional, communicative, learning, etc.). But there have also been inequalities in access to and use of information and basic services, including those that make up the welfare state: education, social services and health.

The existence (or lack) of digital skills in the citizenry becomes a key pillar to minimize the impact of the accelerated digital transformation that some of these basic services have had to develop. In this sense, our study focuses on the perception that various public institutions (in the education, social and health sector) have towards the digital skills of immigrants and digital visitors, as well as the strategies and mechanisms that they have designed and implemented to to guarantee the access and use of the basic information that these generate and that those need.

Through a set of 10 interviews with officials of these institutions, their transcription and subsequent analysis, a set of categories have been generated that describe: the impact of the digital transformation of public organizations, the challenges of access to their digital services and their use by citizens, the profile of users, their main obstacles and gaps in digital skills. The talks have finally made it possible to identify possible actions and decisions that would need to be promoted at both the organizational and policy levels.

RESUMEN (Spanish)

En la época intra y pospandemia ha tenido lugar un fenómeno que ha generado dos procesos paralelos: por un lado, nos ha igualado a todos y, por otro, nos ha revelado lo desiguales que somos (desigualdades que sufrimos a nivel individual, colectivo y global). Y las tecnologías no han quedado al margen de este fenómeno. Gracias a ellas se han posibilitado nuevas conexiones y posibilidades (profesionales, comunicativas, de aprendizaje, etc.). Pero también se han evidenciado desigualdades de acceso y uso a la información y a servicios básicos, entre ellos, los que conforman el estado del bienestar: educación, servicios sociales y sanidad.

La existencia (o falta) de competencias digitales en la ciudadanía se convierte en un pilar clave para minimizar el impacto de la acelerada transformación digital que han tenido que desarrollar algunos de estos servicios básicos. En este sentido, nuestro estudio se centra en conocer la percepción que tienen distintas instituciones públicas (del sector educativo, social y sanitario) acerca de las competencias digitales de los inmigrantes y visitantes digitales, así como de las estrategias y mecanismos que estos han diseñan e implementan para garantizar el acceso y uso de la información básica que estos generan y que aquellos necesitan.

Mediante un conjunto de 10 entrevistas a responsables de estas instituciones, su transcripción y posterior análisis, se han obtenido un conjunto de categorías que describen: el impacto de la transformación digital de las organizaciones públicas, los retos de acceso a los servicios digitales y su uso por parte de la ciudadanía, el perfil de los usuarios, así como sus principales obstáculos y los vacíos existentes en competencias digitales. Las conversaciones han permitido, en último lugar, identificar posibles acciones y decisiones que tanto a nivel de organizaciones como a nivel de políticas sería necesario impulsar.

RESUM (Catalan)

En l'època intra i postpandèmia s'ha produït un fenomen que ha generat dos processos paral·lels: d'una banda, ens ha igualat a tots i, de l'altra, ens ha revelat com de desigualts som (desigualtats que patim a nivell individual, col·lectiu i global). La tecnologia no ha romàs al marge d'aquest fenomen. Gràcies a ella s'han possibilitat noves connexions i possibilitats (professionals, comunicatives, d'aprenentatge, etc.). Però també s'han evidenciat desigualtats d'accés i ús a la informació i a serveis bàsics, entre ells, els que conformen l'estat del benestar: educació, serveis socials i sanitat.

L'existència (o manca) de competències digitals en la ciutadania es converteix en un pilar clau per minimitzar l'impacte de l'accelerada transformació digital que han hagut que desenvolupar alguns d'aquests serveis bàsics. En aquest sentit, el nostre estudi se centra en conèixer la percepció que tenen diverses institucions públiques (del sector educatiu, social i sanitari) vers les competències digitals dels immigrants i visitants digitals, així com les estratègies i mecanismes que aquests han dissenyat i implementat per a garantir l'accés i ús de la informació bàsica que aquests generen i que aquells necessiten.

Mitjançant un conjunt de 10 entrevistes a responsables d'aquestes institucions, la seva transcripció i posterior anàlisi, s'han generat un conjunt de categories que descriuen: l'impacte de la transformació digital de les organitzacions públiques, els reptes d'accés als seus serveis digitals i al seu ús per part de la ciutadania, el perfil dels usuaris, els seus principals obstacles i els buits existents en competències digitals. Les converses han permès, en darrer lloc, identificar possibles accions i decisions que tant a nivell d'organitzacions com a nivell de polítiques seria necessari impulsar.

1. Introduction

The Public administration has been preparing for changing to digital services access and provision for the last decades, some countries even developing strategies of "digital-first services". Both for economic reasons (some approximations indicate a cost between 0'1-10% of the original cost) and in terms of offering better services to the citizens-clients.

Then COVID arrived and in most of the countries of Europe, whole parts of the access and provision for basic services could not be offered in person. Those plans for digital services needed to become reality, and everyone knows how the story goes. We failed miserably in important parts.

In this report we explore the shift to online services in three basic areas: education, health and social services. We will try to identify some pitfalls and good practices that emerged in this process in order to learn and improve the actual and future actions.

In Spain and Catalonia, we had a total lockout or total closure for several months. In Catalonia, the schools and universities closed their physical doors on March 13th and until September 2020. In our university, we have just started with normal lectures. During 43 days all the children and young people remained locked at home.

We present a qualitative approach focused on Catalonia. The Catalan government has the competencies in education, health and social services, but I'm sure some of the issues may be similar in other parts.

2. Literature review

Ellen Helsper (2021) explains that "understanding why inequalities endure requires analysing the interplay between traditional and digital inequalities". This literature review develops one of the links between general and digital inequalities, referred to digital competences between digital and native immigrants.

Approaching the situation of the so-called "digital immigrants" in the post-pandemic reality forces us to ask ourselves who they are, what their circumstances are, and how they live and participate in the digital society. By answering those questions we will be able to detect their needs and help them towards their full development as digital citizens, in full knowledge of their competencies (Carretero et al., 2017).

Therefore, taking into account that they should acquire competencies related to five areas:

- Information and data literacy
- Communication and collaboration
- Digital content creation
- Safety
- Problem solving

These competencies are acquired in eight levels of depth:

- Foundation (levels 1 & 2)
- Intermediate (levels 3 & 4)
- Advanced (levels 5 & 6)
- Highly specialised (levels 7 & 8)

In which the following factors are taken into account:

- Complexity of tasks
- Autonomy
- Cognitive domain

Traditionally, digital immigrants have been understood as those born before digitalisation (Prensky, 2001),

Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings

which has been established by consensus between the 80s and 90s of the last century (Abdul Aziz et al., 2019).

Specifically, Prensky characterises students as digital natives or digital immigrants in the following way:

What should we call these “new” students of today? Some refer to them as the N-(for Net)-gen or D-(for digital)-gen. But the most useful designation I have found for them is Digital Natives. Our students today are all “native speakers” of the digital language of computers, video games and the Internet. So what does that make the rest of us?

Those of us who were not born into the digital world but have, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology are, and always will be, compared with them, Digital Immigrants. (Prensky, 2001, 2-3)

It is an approach that has been successful. Even the terminological bases, which define new concepts that have not yet been incorporated into general dictionaries, are based on Prensky's approach:

Digital native: A person who was born in a standardized digital technological environment and who, having interacted with this technology since the early stages of childhood, has remarkable knowledge and mastery of its applications.

Digital immigrant: Person born before the existence of information and communication technologies who has adopted them at some point in his life. (Termcat, 2021)

The difference between digital natives and digital immigrants concerns their learning process, which has been transferred to other fields. This intuitive approach to reality is not useful from an analytical perspective. Selwyn (2009) shows that the born date does not produce any meaningful evidence.

On the one hand, Selwyn (2009) states that the distinction is based on what technologies they use and how they use them (Consume vs. Create). Along the same lines, Abdul Aziz et al. (2019) note that the only differentiation between digital natives and immigrants that makes sense is by behaviours, by uses, not by age.

On the other hand, it shows that young people can also be excluded from the digital sphere, in more subtle ways, such as in quality and depth of use:

If anything young people's use of the internet can be described most accurately as involving the passive consumption of knowledge rather than the active creation of content – leading, at best, to what Crook (2008) terms a “low bandwidth exchange” of information and knowledge, with any illusion of collaboration described more accurately in terms of co-operation or co-ordination between individuals. (Selwyn, 2009, 372)

Finally, it concludes that the uses of technology are related to socio-economic, class, gender and location factors:

Research studies suggest that young people's abilities to access digital technologies remain patterned strongly along lines of socio-economic status and social class, as well as gender, geography and the many other entrenched “social fault lines” which remain prominent in early twenty-first century society (Selwyn, 2009, 372)

In fact, even the OECD states that the existence of the digital native is a myth (Burns & Gottschalk, 2020). Oth-

Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings

er authors (Massanet et al., 2019), propose replacing the terminology 'digital natives' with 'digital apprentices': "young people who have been born and raised in a media environment that has provided them with a digital space for learning about this digital world, that is, for acquiring transmedia skills".

From a similar point of view to Selwyn (2009); White & Le Cornu (2011) propose using the term digital resident-visitor, according to the uses of technology in the personal and work spheres. Therefore, not as a binary opposition, but as a continuum.

Based on the proposal by White & Le Cornu (2011), Connaway et al. (2017) compile a variety of proposals for analysing the uses of technology by digital visitors and residents. The different strategies presented are a way of characterising and defining, based on the analysis of reality, those competencies that are most lacking for digital immigrants.

An approach that leads us to highlight an obvious fact: citizens are also workers. Digital empowerment (also critical and ethical) must be part of professional training so that administrations and companies can truly offer an environment suitable for a fair society (Haque & Gunther-Canada, 2018).

Kesharwani (2020) relates the four concepts (Fig. 1) (digital native, digital immigrant, resident, visitor), based on the definition of digital native/immigrant according to the following elements: Communication, Mobile phones, Information, sharing, Blogging, Usage behaviour, Involvement level, Primary use.

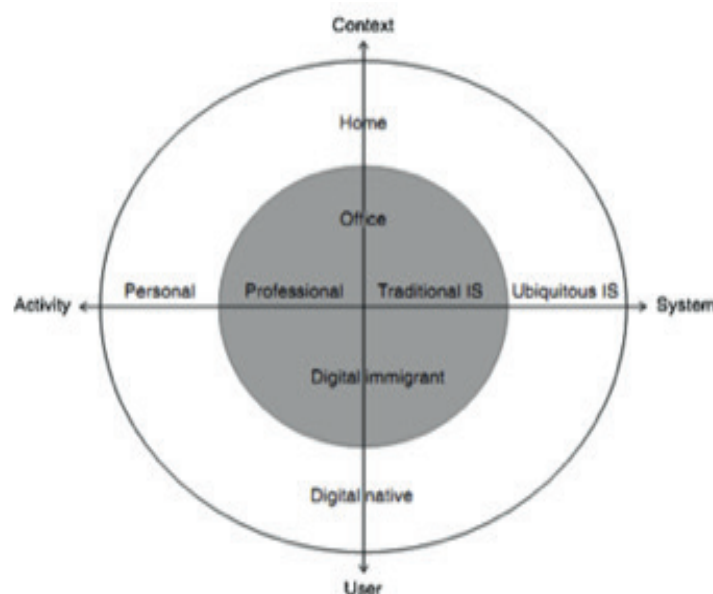


Fig. 1. Dimensions for Understanding the Digital Users and Context of Their Information System Use. (Kesharwani, 2020).

From the referenced studies, one could infer the need to establish a selection and categorisation of competencies that digital immigrants should acquire, in relation to the objectives determined by the European Commission (Carretero et al., 2017). Therefore, visualising which competencies they need to acquire in order to become digital residents in as many contexts as possible. In other words, to detect the training needs of digital apprentices.

Therefore, it makes more sense to focus the analysis on inequalities of use (taking into account the relationship with access), which are closely related to socio-economic issues, and which cut across different groups of age.

Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings

Beyond access to the digital sphere (Digital Divide), which is relatively widespread through mobile devices, the focus should be on the various Digital Inequalities caused by the diversity of use of technologies (DiMaggio & Hargittai, 2001):

- Inequality in technical apparatus: by access to electronic devices and choice and use of software, hardware and connections.
- Inequality in autonomy of use: by autonomy of use. From where the connection is made.
- Inequality in skill: by technological skills.
- Inequality in the availability of social support. Ability to have support for improvement in the use of technology.
- Variation in use: by variety in the typology of uses of the internet, the purposes for which it is used.

In order to address Digital Inequalities, the Digital Fluency model (Wang et al., 2012) could be considered. It takes into account seven factors: demographic characteristics, psychological factors, social influences, educational factors, behavioural intention, opportunity and actual use of technology.

The main idea of the model is that "digital fluency influences the action of technology use". In a way, the use of technology self-generates more use, taking into account that the psychological, social aspects and the intention to use it are the most influential in Digital Fluency.

Knowing how these inequalities affect the population will provide us with useful information for developing actions to promote citizens' digital skills (Carretero et al., 2017). Therefore, the strategy may consist of progressing in the five competencies areas (information and data literacy, communication and collaboration, digital content creation, safety and problem solving), while working to solve the causes of the difference in their acquisition rates (Digital Inequality). Here the importance of starting from the social reality instead of observing an ideal horizon to approach, which could turn out to be a mirage for many of our fellow citizens. Attention to processes and strategies that help digital empowerment and citizen participation could be more useful (Haque & Gunther-Canada, 2018; Tai et al., 2020).

3. Objectives

We used the actual surge of digital services uses during the COVID pandemic as a real case for identifying the problems registered and solutions put into practice both in terms of citizens and professionals in four key sectors.

We focused on:

1. Identifying the main problems of access and use to basic digital resources and services related to four areas: families, social services, education and health.
2. Exploring the requested digital competences required and some recommendations to overcome these problems.

4. Methodology

Ten semi-structured interviews (Smith, 1995; Schmidt, 2004) have been carried out in order to analyze the appraisal of specialists and experts in different fields that could contribute their vision on the objectives set.

4.1 Sample

We sampled experts of digital transformations and workers for these services, conducting 10 interviews (Table 1).

These interviews have been managed to explore the perception of problems about access and use of digital systems during and after the pandemic, in the social, educational and health fields.

With the aim of identifying the main problems of access and use to basic digital resources and services related to social services, education and health.

The specialists have been selected because they know in-depth the school, health and social services situation since they work on the front line, but at the same time, they have positions of responsibility that allow them to know how public procedures are carried out in each area.

These interviews have been conducted to explore their vision about the problems of managing the difficulties of access and exposure to digital resources and environments. With the specific objective of exploring some recommendations to solve these problems.

The experts have been selected for their knowledge in the different areas and their national and international research.

Interviewed	Field of expertise	Type of organisation
1	Education	Catalan government
2	Education	Catalan government
3	Families	University of Barcelona
4	Social services	Local government
5	Social services	Local government
6	Social services	Local government
7	Health	Hospital
8	Business	Private sector
9	Social impact of Internet	Oxford Internet Institute
10	Social impact of Internet	ESADE - Ramon Llull

Table 1. Experts interviewed.

4.2 Procedure

Based on the study of the methodological framework, the objectives for the interviews have been established, and analysis dimensions have been created from each objective.

Goal 1: Identifying the main problems of access and use to basic digital resources and services related to four areas: families, social services, education and health.

Analysis dimensions:

- D1. Impact in services and digital transformation of services
- D2. Challenges of access to digital services

Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings

- D3. Difficulties of use of digital services
- D4. Profile of users /citizens with major problems or difficulties
- D5. Lacks of digital competencies for users /citizens

Goal 2: Exploring some recommendations to solve these problems.

Analysis dimensions:

- D1. Evolution of digital transformation in society
- D2. Obstacles and difficulties about access and use of digital services by citizens
- D3. Strategies and policies needed
- D4. Lacks of digital competencies for users /citizens

A team of two researchers have designed a first question guide for the semi-structured interviews. Later these two researchers with two more others have proceeded to review each question, through a process of knowledgeable discussion.

The final questions were established as shown in the following tables, and were adapted for each of the three áreas: education, health and social services.

Goal 1: Identifying the main problems of access and use to basic digital resources and services related to four areas: families, social services, education and health.

D1. Impact in services and digital transformation of services
--

- | |
|---|
| What relevant resources / services in your field have been digitized?
About these services, which ones have you identified the most problems with? |
|---|

D2. Challenges of access to digital services

- | |
|---|
| What problems with access to digital resources and services have been identified among healthcare professionals?
What problems with access to digital resources and services have been identified among teaching staff?
What problems with access to digital resources and services have been identified among social service staff?
What problems with access to digital resources and services have been identified among health service users?
What problems with access to digital resources and services have been identified among students and / or their families?
What problems with access to digital resources and services have been identified among service users? |
|---|

D3. Difficulties of use of digital services
--

- | |
|---|
| What problems with the use of digital resources and services have been identified among healthcare professionals?
What problems with the use of digital resources and services have been identified among teaching staff?
What problems with the use of digital resources and services have been identified among social service staff? |
|---|

Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings

Goal 2: Exploring some recommendations to solve these problems.
<p>D4. Profile of users /citizens with major problems or difficulties</p> <p>Were you able to identify any professional profile that has had the most difficulty accessing or using these services?</p> <p>Were you able to identify any profiles of users who had more difficulty accessing and using these services?</p>
<p>D5. Lack of digital competencies for users /citizens</p> <p>What are the existing inequities?</p> <p>What do you think these difficulties are due to? (Lack of equipment, lack of habit, lack of knowledge ...).</p> <p>What digital competencies should digital immigrant (or in general citizens) have today?</p>

Table 2. Questions for interviews related to goal 1.

Goal 2: Exploring some recommendations to solve these problems.
<p>D1. Evolution of digital transformation in society</p> <p>We are in a historic moment where there are more and more services and life online and at the same time there are groups with difficulties to be part of. How do you think this situation will evolve?</p>
<p>D2. Obstacles and difficulties about access and use of digital services by citizens</p> <p>What problems with access to digital resources and services have been identified in your field?</p> <p>What problems with the use of digital services have been identified?</p> <p>What are the problems of risks in use and access (fraud, privacy, exposure, addiction, health, cyber-bullying, ...)</p> <p>What are the social consequences of digital illiteracy?</p>
<p>D3. Strategies and policies needed</p> <p>Of these types of problems (access, use and risks) what solutions do you think could be proposed, in terms of policies to be developed?</p>
<p>D4. Lack of digital competencies for users /citizens</p> <p>What digital competencies should digital immigrant (or in general citizens) have today?</p> <p>Of these competencies, which ones are missing in vulnerable groups and how could they be developed in them?</p>

Table 3. Questions for interviews related to goal 2.

Once the interview guide has been reviewed, a protocol has been established for them. Each researcher has interviewed between 2 and 3 experts or specialists.

The interviews have been carried out through videoconferences using Zoom, during April and May 2021, and have been recorded with the prior informed consent of the interviewees.

Finally, the interviews have been transcribed and analyzed from each of the established dimensions by means of a custom-created database.

5. Results and discussion

While respecting the confidentiality of participants, we are able to highlight some of the results. First we explain some PROBLEMS identified (5.1), then some CONFLICTS (5.2) that arose from analysing them.

5.1 Problems identified

5.1.1 On families

A general view shows that digital parenting is a dynamic process co-constructed by parents and children according to each context. Faced with a restrictive vision of the media, educational action is required. The way the family manages and controls children's digital activities and at the same time supports and educates them influences the quality of the child's relationship with the environment. And this also means their safety on the Internet and healthy and responsible use of the media.

Digital services and social networks confront new problems inside families. Families are facing the perception of educational opportunity and are very concerned about the consequences of technology use among children and teenagers. Today's digital media become an opportunity to learn, to communicate, to create, to play, ... But they can also be a source of misinformation, negative social behaviors, risks, abuse, anxiety and tension.

In the first place, there is the belief in families, that controlling the time that children and young people spend on screens, social networks, video games and audiovisual consumption, can be a good control measure. But, on the other hand, the evidence shows that the most important question is not the time we dedicate to the screens, but what we do with them. What kind of tools do we use, how do we use them and why do we use them for.

Family beliefs about digital technologies and their value are a determining axis of the digital education of children and adolescents, but they are also influenced by the context. We can hardly fully understand the relationship of children with digital technologies without considering the socio-economic and cultural context in each case. Different studies have clearly shown that the cultural and socioeconomic position of families influences children's digital literacy and activities with digital technologies at home

Sometimes the less favoured families, and families with children with disabilities are the ones with better hopes with technologies and they are more permissive, but centred on instrumental view. Just letting children use digital devices all you want to contribute to "good learning".

Families have concerns, but they also see the positive ways that technology is supporting and helping their children to play and learn. Parents seem to still have very little knowledge of the actual activities of their children, and at the same time, they feel in need of guidance and advice to promote safe and healthy use of the media. But, on the other hand, usually, the families that receive the education, who assist in meetings and keynotes on digital education for their children, are not the most needed. Just the opposite.

The uncertainties are diverse and there is not much research that shows how parents integrate technologies at home and how they manage children's relationship with screens. The situation shows that beyond worrying, we need to take responsibility for it.

5.1.2 On social services

The most declared problem was related to the lack of communication between professionals and clients, both for processing aid demands and for the actual social interventions. Professionals improvised some digital and analogue channels that drew resources that were lacking elsewhere.

From the interviews, we have seen great variations on actions and caring for digital access for professionals and clients between administrations and localities, sometimes in opposite ways than you may think. Some

Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings

big municipalities seem to have left workers on their own while other smaller municipalities may have done great efforts. Perhaps the bigger the scale, the more complicated it is to offer a clear solution, regardless of the resources available.

The people we interviewed acknowledge that the problems for giving access to information and social services users rely on a broken "citizen attention services" model logic. The social and personal costs have been terrible, some people have been waiting for months without basic economic benefits, such as widow's pensions, just because the normal claiming procedures have been interrupted. Sometimes the public administration (name A) usually ask citizens to go to other administrations (name B) just to take documents for them (prior administration A). This is costly and difficult for any citizen in times of pandemic and before, but it is especially costly for vulnerable people. Why can't these administrations communicate directly?

Our informants also explained cases showing the existence of resources aimed to at least reduce this burden that somehow fail to be put into action for lack of competences from professionals or a bad design (which also shows a lack of digital competences):

- There are online services to check and share information between administrations, but they are not commonly used. Sometimes for a lack of skills from public workers.
- There are online direct services to directly access and process administrative procedures. Some of them are easy and some are difficult to use. The logic of these services follow the administration logic, not the normal citizen's logic.
- In some cases, even the easiest systems can be very impossible to use for an old person.

Within this framework, social services staff explained the use of everyday tools, such as WhatsApp, or "low tech solutions" like telephone to overcome the difficulties. Sometimes just putting a skilled professional to do the online processing with the client in front. These are for good use as "emergency solutions", easy to prepare and access, but not adequate for a normal working tool.

This last solution also created an undesirable effect of focussing too much on offering a good communication channel with social services users/clients, creating a "reaction-reaction" way of working. Some administration officials explained that putting too many resources into maintaining an (inefficient) communication line with users implied a lack of resources to work on the problems that these citizens were confronting. This was a bad solution for both social workers and citizens.

Also, both social services and education staff explain that another problem during the lockout was the disappearance of some families, normally the ones with the most risk of school dropout. And no channels nor solutions were put into action with them.

Finally, both social services and education staff explain that another problem during the lockout was the disappearance of some families, normally the ones with the most risk of school dropout. And no channels nor solutions were put into action with them.

5.1 3 On education

After interviewing experts and specialists on digital education at school and universities, the problems highlighted by them during the pandemic were mainly referred to: a lack of devices; lack of digital competences for families and teachers; shortage of knowledge on didactic use of digital resources.

The absence of connected devices between a bunch of families was the first identified and initially seen as the most important problem. It was solved after some time with third sector and local donations, and Catalan gov-

ernment investment. Lately, it became apparent that this digital divide did not exist only in material resources (computers and Internet connection), it also implied a lack of cultural and educational resources for families. In other words, there was also a "media mentorship gap" in families from economically disadvantaged backgrounds.

Another problem that was very clear in the beginning was the lack of instrumental digital competencies (such as using virtual learning environments and other tools) for primary education teachers. These were later solved with some courses and resources stated by the Catalan government.

After the initial shock, the most difficult problem to solve was related to the didactic use of digital resources. Many teachers focused their educational activity on tools and instruments (Moodle, Zoom, email, or ... whatever) but not on didactic methodology. They simply tried to convey content to their students using video conferencing systems, submitting assignments and reviewing assignments similar to an industrial pedagogical perspective. That is, following a reproductive model focused on curricular content. It then emerged very clearly the lack of online educational activity focused on the creation and construction of knowledge by students.

One of the inherent motives that complicated this process was that most schools did not have a clear digital strategy. Neither about what tools to use (some students were forced to use different platforms and systems from different teachers, sometimes 4 different platforms simultaneously), nor about how to use them, nor for what purpose to use them.

The experts interviewed affirm that the solution is better teacher training, not with courses, but with project support and mentoring, as well as an effort to develop educational and non-instrumental digital skills.

5.1.4 On health

In the last decade, health centers, especially hospitals, have devised a significant investment in e-health apps and technological systems in order to advance towards the so-called "patient centered approach". The pandemic context has accelerated the needs for digital transformation of health in this direction, creating a telemedicine surge, a consolidation of e-health platforms for nearly every procedure, and a need for better training in digital resources for health professionals. With these mainly positive movements have also emerged some problems, with issues related to the flow and confidentiality of the personal health data; the difficult-to-access to digital platforms by specific social groups and the invisibility of some sectors of the population.

The telemedicine "explosion". The impossibility of attending medical centers in person during the pandemic, except in severe cases or those related to Covid-19, has led to a greater use of doctor/patient contact through virtual communication systems. Some centers have had to create specialized ad hoc protocols and have solved communication with patients through virtual encounters.

A consolidation of e-health platforms for procedures, monitoring, medication prescription, etc. Despite the fact that these platforms already existed before de Covid, the lock down caused a migration of many of the daily health procedures to these platforms. For example:

- Offering tablets and phones given by companies for people who are alone.
- Improving medical assistance by teleconference, as we said.
- Apps that let you know the process and where is your relative when they get into an emergency room.
- In Primary Care Centers, direct consultation with your General Practitioner and the nurse by email, phone, etc.

The need for technological training for health professionals. There has been an increase and diversification of

training in this group, meeting the new needs for the use of technologies by doctors and nurses. In the opinion of a head of Digital Transformation Services in a public hospital, the digital acceleration produced by the covid context has allowed the implementation of tools and services that were planned, but whose materialization was very slow.

Meanwhile, this situation, as in education and social services, has generated new challenges and unwanted situations:

Issues related to the flow, treatment and confidentiality of the personal health data. There is no doubt that the multiplicity of communication platforms and channels between physicians and patients (and their families) has generated the need to create systems to guarantee the confidentiality of health-related data. Here a significant challenge is detected, possibly without yet having the exact picture of the complications, gaps and blind spots that exist. We do not know the degree of awareness that professionals and patients have about sharing according to what data through low-security communication channels.

Resistance to change by some professional sectors within the field. Changing certain procedures or increasing part of the work by recording concrete data on a virtual platform can mean a certain reluctance. These changes can generate more work (recording, for example, step by step so that a certain process is digitally recorded), more time (due to a possible lack of familiarity with the environment), etc.

Inaccessibility to digital platforms or difficult-to-access by different groups. Either due to lack of means, or due to difficulties of use, or other reasons, inequalities have been detected in access to health information or its services. As a basic service, administrations and health centers, still trying to mitigate the digital divide, for example, in the very elderly population, people without resources, etc. Usually, online systems are complicated for older people and sometimes even for young people. Because the system follows the logic of service production and departments but not the usability for the citizen. Or because the public services are so formally concerned about data uses that there are too many security checks.

Invisibility of some sectors of the population. The inherent difficulties of some vulnerable groups are magnified in situations where technology is a requirement. People who are in a precarious situation, during the covid, have had even more difficulties in accessing health systems through conventional systems, given the impossibility of attending regular visits in person.

5.2 Conflicts for analysis (medium ground)

Some of the problems in the social services, education or health settings highlighted above, may be related in the form of different conflicting views or tensions that need to be confronted:

- Thinking on the digital divide versus focussing in terms of social inequality and social cohesion.
- Concepts of access, use and learning are related but may not be a clear relationship as we thought.
- Offering courses may not be enough to increase digital competencies in professional settings.
- Sometimes we can't think because we can't stop working, and that's a problem because we need to think for a better action.

5.2.1 Thinking on the digital divide or in terms of social inequality and social cohesion?

Thinking in terms of digital divide helps to identify specific problems and to constrain the working solutions in specific fields in the short term, but we may also need to think about what is causing this digital divide, and this drives us to social inequality. It seems clear that the digital divide is not really an age question, but a socio-economic context issue.

As an example, with this pandemic, we realised the difference between people who can do teleworking, and

help their children while in-home, and people who don't depend on the social position of jobs, highlighting this socio-economic inequality within the country.

The increasing inequality is not only an ethical, social and economic problem, as we previously thought, it spreads on political and coexistence terms. If not confronted, our society gets worse in terms of breaking social cohesion and increasing conflict within the society. The risk of social cohesion is clear and works in several levels or layers. We better start talking about it, rather than on the digital divide. It has political, democratic and social mobility effects, and we can do something.

Social inequality is linked to this risk of breaking social cohesion through digital consumption. When we lose the ability to analyze the information, we fail to realize that our world is more diverse than the world and opinions we gather from our social networks, networks that are defined by our homophily on extreme (the trend to be surrounded by people with similar opinions on specific issues we value). The algorithms tend to promote people like us, and it has effects on our tolerance and our ability to empathize. This fact promotes social polarization, reduces our ability to dialogue, and it breaks our societies.

The ability needed to analyze information, to distinguish what is wrong and right, what society thinks, away from our Twitter feeds, is getting more difficult to achieve. And more needed at the same time.

5.2.2 Access, use and learning are not linear or even clear relations, but we act like that.

We used to think that simply giving more access to digital devices (smartphones, tablets or computers) will increase their use and this will then improve people's learning. It is now clear that this is more complicated now. We can increase the access and the uses may be so specific and unrelated to learning processes that they may even reduce learning. The weak link in this chain seems to be the learning process.

An example is the concern from schools with the access (devices and connection) and with the uses of VLE's (Moodle, Classroom, etc.), things that were mainly solved after a year, but few concerns were related to actual learning conditions. Another example came from interviews, as some of the main concerns of teachers using online distance teaching during the pandemic was how to prevent students from cheating in exams. We know it may not be the main worrying issue in terms of learning, but it was their basic problem for some of them, instead of thinking about the actual learning process. We may need to put learning first, and then digital access and use. It may help to focus on the needed aspects of the digital paradigm. But it may be more difficult, as it leads to thinking on a model, on a more abstract view, instead of an instrumental easy solving issue.

5.2.3 The mantra "make more courses" may not be working to increase digital competencies without applying them in their daily professional life.

One of the problems highlighted before is a certain lack of digital competencies from teachers, social workers, doctors, nurses, etc., and it may seem that it leads to a solution: make more courses, but the interviews seem to show otherwise. This is a very important one, and we saw this message repeated constantly from both the professionals and experts on education, social services and general alike. They say: "Stop offering courses and start requiring real uses and experiences."

"People are tired of making courses," some say, but it is not working. On education, offering more courses on digital competencies on teaching....is not the solution. Too many years doing it, and the result is disappointing. The same on social services and in health. We may need different strategies for different centres, and different groups, with a clear application in the classroom or to different problems. We may need to step up and simply demand it to be put into practice, and professionals must be evaluated about this digital competence.

5.2.4 Working versus Thinking. We can't think because we can't stop working, and that's a problem because we need to think for better action.

A quite common message from professionals is that we have been in emergency mode for more than a year, and we need to finish this emergency mode, because it is affecting our jobs and responsibilities. It's common in education, health and social services hearing that "we can't think on problems because we can't stop working on short-term problems". It seems that after 1 year of acting in emergency mode, everyone realizes that we need to think.

The main issue is the need to think on how to adapt to the digitalisation of society, because the interviewed participants agree that the main problems are not going to back away, even in the short term. The risk then is not to be wrong or to make mistakes, the real risk is to turn on business as usual, to change again into normal mode in social services, education or healthcare services.

Interviewees highlight that some changes will rest here, some changes are good and need to be maintained, but it compels us to rethink our jobs. We need to use our experiences as a precious experiment, an experiment that showed us what failed and what succeeded.

From the user's point of view, we need to start thinking globally towards a new model for "citizen information's office". The fragmented logic of public services may have some logic in face-to-face services, but it is illogic in a digital world. This change needs to be transparent for citizens, but adjusting it to existing services may be very complicated for professionals and bureaucrats.

6. Conclusions: some ideas to learn

We have achieved the goals of identifying the main problems of access and use to basic digital resources and services related to families, social services, education and health during COVID, and we explored the requested digital competences required. We also identified some of the tensions emerging from these problems. With this information we can share some ideas or recommendations to overcome these problems, some ideas that may be useful to inform at least a fraction of these problems and conflicts.

6.1 Thinking in terms of Double loop learning.

We failed in some crucial issues but, to learn from failures, we need to think in terms of second loop learning. This is a term coined by Chris Argyris, in the fields of pedagogy, psychology and organizational management. Single-loop learning is knowing what failed, double-loop learning relates to knowing why it was not solved before.

We now know where some of the problems are, but we may need to ask: why are these problems not solved yet after decades? That means focusing on resistance. If we do not address those elements, the defensive practices, the difficulties to manage the unknown situations, the fears, we will not change anything. We have enough demonstrations that even legal changes may not mean anything. We need to think about managing change, and it is not easy. We need to talk with politicians, we need to think in terms of long or medium-term views, and stop focusing on short term goals. Some workers also have their agendas and don't like to change. If we don't start with the resistance and defensive practices, where do they come from, and think long term, we will not be able to solve those problems.

In the fields of education, social services and health, the change is intrinsic. If we link this need for change in these sectors to the need to develop digital skills (also changing), perhaps we need to learn that learning from change, adapting to change, anticipating change and causing change are four of the basic axes of the citizen training of the present and the future.

6.2 Learning to swim on the ethical flow

This is a term used by one of our interviewed people. I understand it as it follows: when we mix technology and society in our digital capitalism, we produce some ethical messes. And we need to get involved in those messes, and make informed decisions.

As an example, experts show that the public administrations have the duty and responsibility to ensure a digital sovereign, putting citizens personal data from public services as far away from the big corporations as possible. On the other hand, professionals want more easy access to tools. As a result, the Administration offers Moodle as a VLE (open source and controlled data from students) but a lot of teachers prefer and want Google Classroom. Selecting the tool is a political decision. Sometimes the "easy-fast" technology is promoted by the big corporations. Sometimes the best technology is the worst by social and ethical implications. We must realize these implications. We must learn to swim on contradictions of this ethical flow.

6.3 Discussing the problems of vulnerable people with vulnerable people.

We (usually) don't act/reach this kind of people that we want, or at least pretend to take care. If we do, or when we try to do it, the results seem to be better. One of the experts interviewed explained the case of a migrated woman, who showed her most precious digital competency to learn: learning to use Google maps because it meant she could go to work anyplace inside the city and never be late. And Google Drive, because it meant she could do the homework with her daughter, who lived in another country. There are a plethora of participatory design methodologies, we should start applying them directly with the vulnerable people we want to help.

Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings

Bibliography

- Abdul Aziz, M. N., Harun, S. N., Baharom, M. K., Ramlie, M. K., & Mohd Shuib, A. S. (2019). Classifying digital natives and digital immigrants as the museum visitors: A conceptual framework. *Journal of Advanced Research in Dynamical and Control Systems*, 11(8 Special Issue), 291–300.
- Burns, T., & Gottschalk, F. (Eds.). (2020). *Education in the Digital Age: Healthy and happy children*. OECD Publishing. <https://doi.org/https://doi.org/10.1787/1209166a-en>
- Carretero, S., Vuorikari, R., & Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, EUR 28558 EN. [http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106281/web-digcomp2.1pdf_\(online\).pdf](http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106281/web-digcomp2.1pdf_(online).pdf)
- Connaway, L. S., Kitzie, V., Hood, E. M., & Harvey, W. (2017). *The Many Faces of Digital Visitors & Residents: Facets of Online Engagement*. OCLC Research. <https://doi.org/10.25333/C3V63F>
- DiMaggio, P., & Hargittai, E. (2001). From the “Digital Divide” to “Digital Inequality”: Studying Internet use as Penetration Increases. Center for Arts and Cultural Policy Studies, Princeton University. Working Paper Series, 15, 1–23. https://culturalpolicy.princeton.edu/sites/culturalpolicy/files/wp15_dimaggio_hargittai.pdf
- Han, B.-C. (2015). *The Transparency Society*. Stanford Briefs.
- Han, B.-C. (2017). *Psychopolitics: Neoliberalism and New Technologies of Power*. Verso Books.
- Haque, A., & Gunther-Canada, W. (2018). Public service for all: How a global ethic prepares public administrators for a transnational century. *Journal of Public Affairs Education*, 24(1), 8–26. <https://doi.org/10.1080/15236803.2018.1429823>
- Helsper, Ellen (2021). *The digital disconnect*. Thousand Oaks: SAGE Publications Ltd.
- Kesharwani, A. (2020). Do (how) digital natives adopt a new technology differently than digital immigrants? A longitudinal study. *Information and Management*, 57(2), 103170. <https://doi.org/10.1016/j.im.2019.103170>
- Masanet, M. J., Guerrero-Pico, M., & Establés, M. J. (2019). From digital native to digital apprentice. A case study of the transmedia skills and informal learning strategies of adolescents in Spain. *Learning, Media and Technology*, 44(4), 400–413. <https://doi.org/10.1080/17439884.2019.1641513>
- Prensky, M. (2001). Digital Natives, Digital Immigrants Part 1. *On the Horizon*, 9(5), 1–6. <https://doi.org/10.1108/10748120110424816>
- Saura, G. (2020). Filantropocapitalismo digital en educación: Covid-19, UNESCO, Google, Facebook y Microsoft. *Teknokultura. Revista de Cultura Digital y Movimientos Sociales*, 17(2), 159–168. <https://doi.org/10.5209/tekn.69547>
- Selwyn, N. (2009). The digital native: myth and reality. *Aslib Proceedings*, 6(4), 364–379. <https://doi.org/10.1108/00012530910973776>

Developing Digital Competence Framework for Digital Immigrants via Mapping of Perceptions and Meanings

Schmidt, C. (2004) The analysis of semi-structured interviews. In Flick, U., von Kardorff, E. and Steinke (eds.) *A companion to qualitative research*, 253-258. Sage Publications.

Smith, J. A. (1995). Semi structured interviewing and qualitative analysis. In: Smith, Jonathan A. and Harre, R. and Van Langenhove, L. (eds.) *Rethinking Methods in Psychology*. Sage Publications, pp. 9-26. <http://dx.doi.org/10.4135/9781446221792.n2>

Tai, K. T., Porumbescu, G., & Shon, J. (2020). Can e-participation stimulate offline citizen participation: an empirical test with practical implications. *Public Management Review*, 22(2), 278–296. <https://doi.org/10.1080/14719037.2019.1584233>

Termcat (2021). Cercaterm. <https://www.termcat.cat/ca/cercaterm>

Wang, E., Myers Michael, D., & Sundaram, D. (2012). Digital natives and digital immigrants: towards a model of digital fluency. *ECIS 2012 Proceedings*. Paper 39. <http://aisel.aisnet.org/ecis2012/39>

White, D. S., & Le Cornu, A. (2011). Visitors and residents: A new typology for online engagement. *First Monday*, 16(9). <https://firstmonday.org/ojs/index.php/fm/article/view/3171/3049>

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