Inclusion Policy Lab: Evaluation result

Asturias: CONECT-AS - digital social inclusion

May 2024

Financiado por la Unión Europea NextGenerationEU
MINISTERIO DE INCLUSIÓN, SEGURIDAD SOCIAL Y MIGRACIONES
Plan de Recuperación, Transformación y Resiliencia
Principado de Asturias
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The General Secretariat of Inclusion of the Ministry of Inclusion, Social Security, and Migration has prepared this report within the framework of the Inclusion Policy Lab, as part of the Recovery, Transformation, and Resilience Plan (RTRP). It has been funded by the Next Generation EU funds. As the agency in charge of carrying out the project, the Department of Social Rights and Welfare of the Principality of Asturias has collaborated in the elaboration of this report. This collaborating entity is one of the implementers of the pilot projects and has collaborated with the General Secretariat of Inclusion in the design of the RCT methodology, actively participating in the provision of the necessary information for the design, monitoring, and evaluation of the social inclusion itinerary. Furthermore, their collaboration has been essential to gathering informed consents, ensuring that participants in the itinerary were adequately informed and that their participation was voluntary.

A research team coordinated by CEMFI (Center for Monetary and Financial Studies) has substantially contributed to this study. Specifically, Manuel Bagües, professor at the University of Warwick, under the coordination of Mónica Martínez-Bravo (until January 8, 2024) and Samuel Bentolila, professors at CEMFI, participated. The researchers have actively participated in all phases of the project, including the adaptation of the initial proposal to the needs of the evaluation through randomized experiments, the evaluation design, the design of measurement instruments, data processing, and the performance of econometric estimations that lead to quantitative results.

The partnership with J-PAL Europe has been a vital role in the efforts of the General Secretariat of Inclusion to improve social inclusion in Spain. Their team has provided technical support and shared international experience, assisting the General Secretariat in the comprehensive evaluation of pilot programs. Throughout this partnership, J-PAL Europe consistently demonstrated a commitment to fostering evidence-based policy adoption, integrating empirical data into strategies that promote inclusion and progress within our society.

This evaluation report has been produced using the data available at the time of its writing and it is based on the knowledge acquired about the project up to that date. The researchers reserve the right to clarify, modify, or delve into the results presented in this report in future publications. These potential variations could be based on the availability of additional data, advances in evaluation methodologies, or the emergence of new information related to the project that may affect the interpretation of the results. The researcher is committed to continuing exploring and providing more accurate and updated results for the benefit of the scientific community and society in general.

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Executive Summary

- The **Minimum Income Scheme**, established in May 2020, is a minimum income policy that aims to guarantee a minimum income to vulnerable groups and provide ways to promote their social and labor integration.
- Within the framework of this policy, the Ministry of Inclusion, Social Security, and Migration (MISSM) fosters a strategy to promote inclusion through pilot projects of social innovation, which is conducted in the **Inclusion Policy Lab**. These projects are evaluated according to the standards of scientific rigor and using the methodology of Randomized Controlled Trials.
- This document presents the evaluation results and main findings of the project "CONECT-AS - digital social inclusion", which has been conducted in cooperation between **the Ministry of Inclusion, Social Security and Migration (MISSM) and the Department of Social Rights and Welfare of the Principality of Asturias**.
- This study evaluates the effectiveness of a **digital skills acquisition program** and access to **on-demand support** and advice among beneficiaries aged over 18 of the Minimum Income Scheme (MIS) and/or Basic Social Wage (SSB) across the **78 councils** of the **Principality of Asturias**.
- All project participants were provided with a **CONECT-AS voucher**, entailing €1,000 **financial assistance for acquiring a laptop** and Internet connection. Additionally, individuals in **Treatment Group A** were enrolled in a specialized **training program** designed to improve their **digital skills**, while **Treatment Group B** had access to **on-demand support** and advice through nearby community devices.
- Among the **1,654 participants** who agreed to take part, 550 were designated to the Control Group, whereas Treatment Group A and Treatment Group B, each comprised 552 individuals.
- **Women comprised 69% of the participants**, with an average age of 46 years. The typical participant has completed high school, and households average 2.3 members, including 0.7 children. About **51% of participants receive benefits from the Minimum Income Scheme** (MIS), while **67% receive the Basic Social Wage** (SSB). Most participants reside in municipalities with populations exceeding 20,000 inhabitants.
- Treatment Group A participants engaged with the accompaniment itinerary at an average rate of 69%, whereas Treatment Group B participants averaged a 16% participation rate in the same program.
- The main results of the evaluation are as follows:
    - **The treatment improves interaction with the Public Administration by digital means:** Group A, which underwent the training program, significantly boosted the volume of online procedures and interactions with Public Administration (a 13% increase compared to the control group), online transactions for SSB/MIS modifications (a 17% increase), and adoption of digital identity (a 60% increase).
    - There are no significant effects on **digital skills** or the **use of digital media for daily activities**, except for the 5.6% increase in interest in expanding digital knowledge for those participants who undertook the training.

- As for Treatment Group B, no significant differences were observed with respect to the Control Group in any of the dimensions considered.

1 Introduction

General Regulatory Framework

The Minimum Income Scheme (MIS), regulated by Law 19/2021[1], is an economic benefit whose main objective is to prevent the risk of poverty and social exclusion of people in situations of economic vulnerability. Thus, it is part of the protective action of the Social Security system in its non-contributory modality and responds to the recommendations of various international organizations to address the problem of inequality and poverty in Spain.

The provision of the MIS has a double objective: to provide economic support to those who need it most and to promote social inclusion and employability in the labor market. This is one of the social inclusion policies designed by the General State Administration, together with the support of the Autonomous Communities, the Third Sector of Social Action, and local corporations[2]. It is a central policy of the Welfare State that aims to provide minimum economic resources to all individuals in Spain, regardless of where they live.

Within the framework of the National Recovery, Transformation, and Resilience Plan (RTRP) [3], the General Secretariat of Inclusion (onward SGI by its acronyms in Spanish) of the Ministry of Inclusion, Social Security and Migration (MISSM) participates significantly in Component 23 "New public policies for a dynamic, resilient and inclusive labor market", framed in policy area VIII: "New care economy and employment policies".

Investment 7: "Promotion of Inclusive Growth by linking socio-labor inclusion policies to the Minimum Income Scheme" is among the reforms and investments proposed in this Component 23. Investment 7 promotes the implementation of a new model of inclusion based on the MIS which reduces income inequality and poverty rates. Therefore, the MIS goes beyond being a mere economic benefit and supports the development of a series of complementary programs that promote socio-labor inclusion. However, the range of possible inclusion programs is very wide, and the government decides to pilot different programs and interventions to evaluate them and generate knowledge that allows prioritizing certain actions. With the support of investment 7 under component 23, the MISSM establishes a new framework for pilot inclusion projects constituted in two phases through two royal decrees covering a set of pilot projects based on experimentation and evaluation:

[1] Law 19/2021, dated December 20, establishing the Minimum Income Scheme (BOE-A-2021-21007).

[2] Article 31.1 of Law 19/2021, of December 20, 2021, establishing the Minimum Income Scheme.

[3] The Recovery, Transformation, and Resilience Plan refers to the Recovery Plan for Europe, which was designed by the European Union in response to the economic and social crisis triggered by the COVID-19 pandemic. This plan, also known as Next Generation EU, sets out a framework for the allocation of recovery funds and for boosting the transformation and resilience of member countries' economies.

- **Phase I: Royal Decree 938/2021**[4], through which the MISSM grants subsidies for the execution of 16 pilot projects of inclusion pathways corresponding to autonomous communities, local organizations, and the Third Sector of Social Action organizations. This royal decree contributed to the fulfillment of milestone number 350 and monitoring indicator 351.1 of the RTRP.
- **Phase II: Royal Decree 378/2022**[5], which grants subsidies for a total of 18 pilot projects of inclusion pathways executed by autonomous communities, local organizations, and the Third Sector of Social Action organizations. Along with the preceding Royal Decree, this one helped the RTRP's monitoring indicator number 351.1 to be fulfilled.

To support the implementation of evidence-based public and social policies, the Government of Spain decided to evaluate the social inclusion pilot projects using the Randomized Controlled Trial (RCT) methodology. This methodology, which has gained relevance in recent years, represents one of the most rigorous tools to measure the causal impact of a public policy intervention or a social program on indicators of interest, such as social and labor insertion or the well-being of beneficiaries.

Specifically, RCT is an experimental method of impact evaluation in which a representative sample of the population potentially benefiting from a public program or policy is randomly assigned either to a group receiving the intervention or to a comparison group that does not receive the intervention for the duration of the evaluation. Thanks to the random allocation of the program, this methodology can statistically identify the causal impact of an intervention on a series of variables of interest. This methodology enables us to analyze the effect of this measure, which helps determine if the policy is adequate to achieve the planned public policy objectives. Experimental evaluations enable us to obtain rigorous results of the intervention effect, i.e., what changes the participants have experienced in their lives due to the intervention. In addition, these evaluations provide an exhaustive analysis of the program and its effects, providing insights into why the program was effective, who has benefited most from the interventions, whether there were indirect or unexpected effects, and which components of the intervention worked, and which did not.

These evaluations have focused on the promotion of social and labor inclusion among MIS beneficiaries, recipients of regional minimum incomes and other vulnerable groups. In this way, the MISSM establishes a design and impact evaluation of results-oriented inclusion policies, which offers evidence for decision-making and its potential application in the rest of the territories. The promotion and coordination of 32 pilot projects by the Government of Spain has led to the establishment of a laboratory for innovation in public policies of global reference named the Inclusion Policy Lab.

[4] Royal Decree 938/2021, of October 26, 2021, which regulates the direct granting of subsidies from the Ministry of Inclusion, Social Security, and Migration in the field of social inclusion, for an amount of 109,787,404 euros, within the framework of the Recovery, Transformation, and Resilience Plan (BOE-A-2021-17464).

[5] Royal Decree 378/2022, of May 17, 2022, regulating the direct granting of subsidies from the Ministry of Inclusion, Social Security, and Migration in the field of social inclusion, for an amount of 102,036,066 euros, within the framework of the Recovery, Transformation and Resilience Plan (BOE-A-2022-8124).

For the implementation and development of the Inclusion Policy Lab, the General Secretariat of Inclusion has established a governance framework that has made it possible to establish a clear and potentially scalable methodology for the design of future evaluations, and the promotion of decision-making based on empirical evidence. The General State Administration has had a triple role as promoter, evaluator, and executive of the different programs. Different regional and local administrations and the Third Sector of Social Action organizations have implemented the programs, collaborating closely in all their facets, including evaluation and monitoring. In addition, the Ministry has had the academic and scientific support of the Abdul Latif Jameel Poverty Action Lab (J-PAL) Europe and the Centre for Monetary and Financial Studies (CEMFI), as strategic partners to ensure scientific rigor in the assessments. Likewise, the Inclusion Policy Lab has an Ethics Committee, which has ensured the strictest compliance with the protection of the rights of the people participating in the social inclusion itineraries.

This report refers to the pilot project "CONECT-AS - digital social inclusion", executed within the framework of Royal Decree 938/2021[6] by the Ministry of Social Rights and Welfare of the Autonomous Community of the Principality of Asturias. This report contributes to the fulfillment of milestone 351 of the RTRP: "After the completion of at least 18 pilot projects, publication of an evaluation on the coverage, effectiveness and success of the MVI, including recommendations to increase the level of application and improve the effectiveness of social inclusion policies".

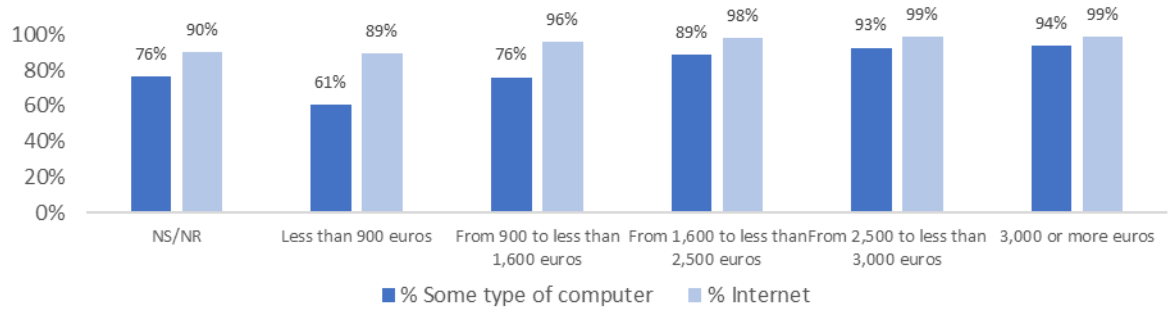
Project context

Information and Communication Technologies (ICTs) have become critically significant, extending their impact from mere communication to essential pillars for accessing information, education, employment opportunities, and civic engagement. The term digital gap highlights inequalities in the use, access, and quality of ICTs across various demographic groups. This complex issue is interconnected with structural issues such as poverty, social exclusion, and challenges in the labor market.

The disparity in access represents a prominent manifestation of these inequities, revealing discrepancies in the availability of ICT resources. According to the 2023 Survey on Equipment and Use of Information and Communication Technologies in Households conducted by the National Institute of Statistics (INE), factors such as geographic location and economic status contribute to these variations. Rural areas, for example, may face barriers in accessing high-speed internet, while individuals with limited financial resources may encounter difficulties in obtaining technological devices or internet service.

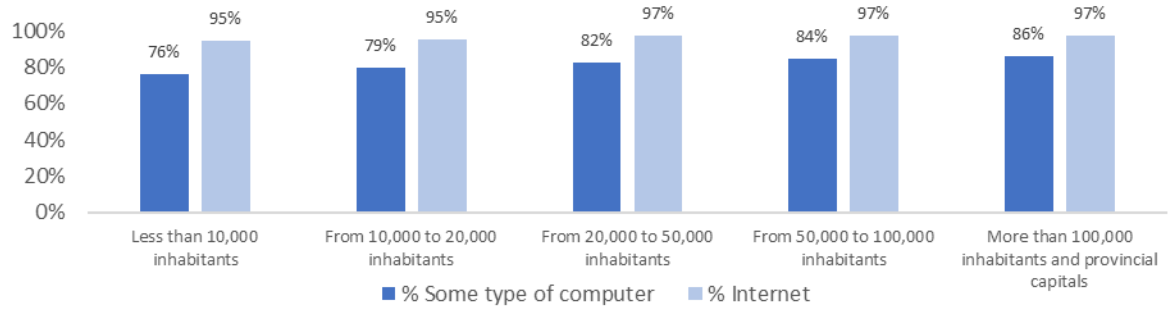
[6] On 16 December 2021, an agreement was signed between the General State Administration, through the SGI, and the Principality of Asturias for the implementation of a project for digital inclusion within the framework of the Recovery, Transformation, and Resilience Plan, which was published in the "*Boletín Oficial del Estado*" on 1 February 2022 (BOE no. 27).

Figure 1. Percentage of Households with computers of any type and internet access according to net monthly household income



Source: Survey on Equipment and Use of Information and Communication Technologies in Households, INE

Figure 2. Percentage of Dwellings with computers of any type and internet access by habitat



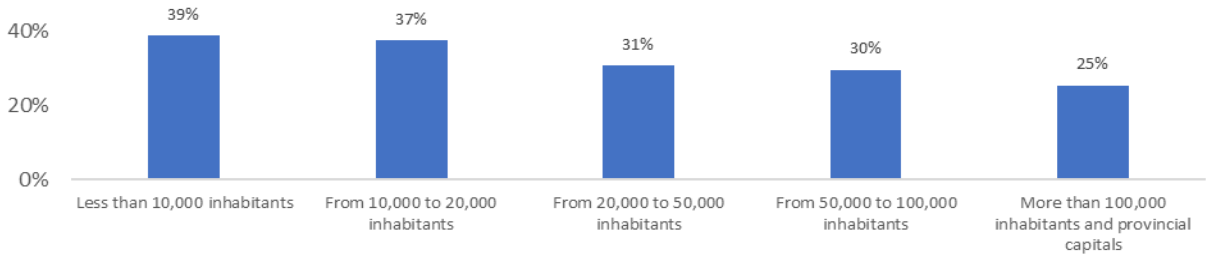
Source: Survey on Equipment and Use of Information and Communication Technologies in Households, INE

Additionally, the skills gap poses a notable challenge, highlighting disparities in the effective utilization of ICTs. Even with barriers to access addressed, some individuals may lack the necessary skills to maximize technological functionalities. This shortfall may result from inadequate education or training in technology usage, alongside a lack of confidence or experience in this domain, thereby curtailing the potential benefits of ICTs, including access to information, online education, employment opportunities, and social integration. The subsequent charts reveal significant inequalities in digital skills between lower-income households and smaller locales compared to their counterparts in higher-income brackets and larger metropolitan regions.

Figure 3. Percentage of people with low or lower Digital Skills according to net monthly household income

Source: Survey on Equipment and Use of Information and Communication Technologies in Households, INE

Figure 4. Percentage of people (16 to 74 years old) with low or lower Digital Skills according to habitat



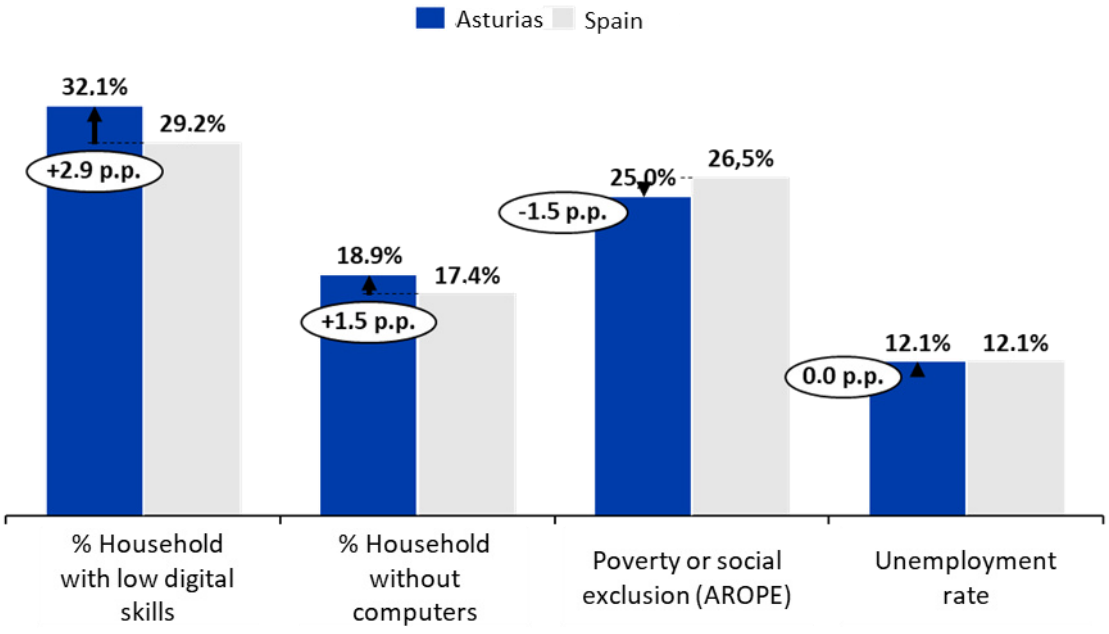
Source: Survey on Equipment and Use of Information and Communication Technologies in Households, INE

Addressing this issue is imperative for several reasons, including the following key points:

- The digital skill gap poses a risk of disconnection for individuals who, due to their circumstances or personal situations, are marginalized, thereby exacerbating their vulnerability. This issue is particularly critical as government and public services increasingly transition online, leaving those without internet access at a disadvantage in accessing essential benefits and services.
- Conversely, the widespread and inclusive adoption of new technologies presents an exceptional opportunity to enhance the quality of life for citizens experiencing social or economic exclusion. It facilitates access to educational resources, remote employment opportunities, and healthcare services through digital platforms. Moreover, it promotes social connectivity, enabling these individuals to engage in community networks and access government services more efficiently. Ultimately, integrating new technologies can serve as a pivotal tool in positively transforming the lives of individuals facing social exclusion, fostering equity, and enabling full participation in the digital era.

In this context, the autonomous community of the Principality of Asturias stands to benefit significantly from targeted interventions aimed at reducing the digital skill gap. The region faces substantial digital challenges, with 32.1% of its population possessing low or lower digital skills, compared to the national average of 29.2%. Additionally, 18.9% of households lack access to computers, exceeding the national average of 17.4%. Economically, INE data reveal that the community has a poverty or social exclusion risk (AROPE indicator) of 25.0%, mirroring the national average of 26.5%. Moreover, Asturias reports an unemployment rate of 12.11%, similar to the national rate of 12.18%.

Figure 5: Differences between Asturias and the national average in households with low digital skills, households without computers, poverty rate and unemployment rate



Source: Survey on Equipment and Use of Information and Communication Technologies in Homes, INE. Living Conditions Survey, INE. Active Population Survey, INE.

Regulatory framework associated with the project and governance structure

Several public institutions have prioritized efforts to address the digital skill gap, a globally acknowledged concern. The United Nations has underscored the importance of narrowing this gap since the World Summit on the Information Society, emphasizing the need for investments in infrastructure and digital competencies. In an increasingly digitized world following the pandemic, this disparity gains significant relevance and urgency.

At the European level, two key initiatives have emerged to confront this issue. Firstly, the Digital Education Action Plan 2021-2027 endeavors to enhance the quality and accessibility of digital education throughout Europe, promoting a high-performance digital education ecosystem and advancing digital skills. Secondly, Europe's Digital Decade sets specific targets in connectivity, digital skills, and digital public services, aiming to ensure equitable access to technology and innovation benefits for all.

At the national level, the Government of Spain has launched initiatives such as Digital Spain 2026, a strategic plan aimed at fostering the country's digital transformation to achieve inclusive economic growth. Part of the broader 2026 Digital Agenda and the Recovery, Transformation, and Resilience Plan, the National Digital Skills Plan focuses on enhancing digital training and inclusion for both the general population and workers. This initiative entails a substantial investment of 3.75 billion euros spanning from 2021 to 2023. These efforts are designed to address social, gender, and regional disparities while promoting digital advancement across Spain.

Finally, all European and national regulations are in line with the framework established in the 2030 Agenda and with the Sustainable Development Goals (SDGs).

The pilot project discussed in this report is aligned with European and national strategies addressing disparities in digital access and social exclusion, as well as with the 2030 Agenda for Sustainable Development, contributing specifically to SDGs 1, 4, 5, and 10.

In response to the requirement for assistance among vulnerable groups in managing electronic procedures during lockdowns, the Principality of Asturias has devised a project aimed at promoting inclusive digital activation. This initiative seeks to diminish the disparities faced by individuals at risk of poverty and social exclusion. The goal is to equip them with essential digital skills necessary for full civic engagement through electronic administration, fostering the development of digital identities, and ensuring access to public services via digital platforms. This effort is geared towards overcoming both material and skill-based barriers to digital inclusion.

Regarding the scientific objectives of the project, it aims to achieve three specific goals: firstly, to determine the effectiveness of personalized itineraries in promoting digital inclusion in contrast to simply ensuring access (ensuring access to at least one device with internet connectivity); secondly, to evaluate how access to on-demand support and guidance for nearby devices contributes to enhancing digital inclusion compared to solely addressing access; and finally, to investigate whether and to what extent personalized pathways deliver superior outcomes in enhancing digital inclusion compared to offering on-demand support and guidance for nearby devices.

The governance framework set up for the proper implementation and evaluation of the project includes the following actors:

- The **Department of Social Rights and Welfare of the Principality of Asturias**, as the entity responsible for the execution of the project.
- The **Ministry of Inclusion, Social Security, and Migration** (MISSM) as the project funding source, and the main responsible for the RCT evaluation process. Thus, the **General Secretariat of Inclusion** (SGI) assumes the following commitments:
    - Providing support to the beneficiary organization for the design of actions to be conducted for the execution and monitoring of the grant object, as well as profiling potential participants in the pilot project.
    - Designing the randomized controlled trial (RCT) methodology of the pilot project in coordination with the beneficiary organization and scientific collaborators. Additionally, conducting the project evaluation.
    - Ensuring strict compliance with ethical considerations by obtaining approval from the Ethics Committee.
- **CEMFI and J-PAL Europe**, as scientific and academic institutions supporting MISSM in the design and RCT evaluation of the project.

In view of the above, this report follows the following structure. **Section 2** provides a project description, detailing the issues to be addressed, the target audience for the intervention, and the

specific interventions associated with improving levels of social inclusion. Next, **Section 3** contains information related to the evaluation design, defining the theory of change linked to the project, hypotheses, sources of information, and indicators used. **Section 4** describes the implementation of the intervention, the analysis of the sample, the results of random allocation, and the level of participation and attrition in the intervention. This section is followed by **Section 5**, which presents the evaluation results, along with a detailed analysis of the econometric analysis carried out and the results for each of the indicators used. Finally, the general conclusions of the project evaluation are described in **Section 6**. Besides, in the **Economic Management and Regulatory** appendix, additional information is provided on management tools and project governance.

Ethics Committee linked to the Social Inclusion Itineraries

During research involving human individuals, in the field of biology or the social sciences, researchers and workers associated with the program often face ethical or moral dilemmas in the development of the project or its implementation. For this reason, in many countries it is a common practice to create ethics committees that verify the ethical viability of a project, as well as its compliance with current legislation on research involving human beings. The Belmont Report (1979) and its three fundamental ethical principles – respect for individuals, profit, and justice – constitute the most common frame of reference in which ethics committees operate, in addition to the corresponding legislation in each country.

With the aim of protecting the rights of participants in the development of social inclusion itineraries and ensuring that their dignity and respect for their autonomy and privacy are guaranteed, Order ISM/208/2022 dated March 10 creates the Ethics Committee linked to the Social Inclusion Itineraries. The Ethics Committee, attached to the General Secretariat of Inclusion and Social Welfare Objectives and Policies, is composed of a president – with an outstanding professional career in defense of ethical values, a social scientific profile of recognized prestige and experience in evaluation processes – and two experts appointed as members.

The Ethics Committee has conducted analysis and advice on the ethical issues that have arisen in the execution, development, and evaluation of the itineraries, formulated proposals in those cases that present conflicts of values and approved the evaluation plans of all the itineraries. In particular, the Ethics Committee issued its approval for the development of this evaluation on February 22, 2023.

1 Description of the program and its context

This section describes the program that the Department of Social Rights and Welfare of the Principality of Asturias implemented within the framework of the evaluation project. The target population and territorial framework are described, and the intervention is described in detail.

1.1 Introduction

The primary aim of the project "CONECT-AS" is to reduce the digital disparities experienced by individuals at risk of poverty and social exclusion. Specifically, the project targets beneficiaries of minimum incomes (such as Minimum Income Scheme or Basic Social Wage). The actions for inclusive activation focus on achieving the following specific objectives: (i) Developing digital skills essential for full civic engagement through electronic administration and fostering citizens' digital identities; and (ii) Ensuring access to public services via digital platforms.

Additionally, the project seeks to assess how receiving a customized itinerary and/or having access to on-demand support and advice on nearby devices promote digital equity compared to merely bridging the access gap (i.e., providing access to at least one device with its own internet connection).

The project draws inspiration from Kentaro Toyama's theory of "technology amplification" (2011), which posits that the impact of technology is not merely additive or inherently transformative. Rather, its effectiveness hinges on the presence and adequacy of complementary factors such as institutional capacity. Put simply, access to technology alone cannot substitute for deficiencies in institutional frameworks or human behavior.

In this context, various studies indicate that adequate training in information technologies can reduce unemployment and enhance mental health (Audhoee et al., 2010; Briscese et al., 2022). Moreover, randomized controlled trials (RCTs) underscore the positive impact of digital training. For instance, Roessler et al. (2021) conducted an RCT in Tanzania, revealing that smartphones increased annual per capita consumption by 20% in households after 13 months compared to the control group. Similarly, a study by Lee et al. (2022) in South Korea demonstrated that digital literacy training for adults aged over 65 led to improvements in well-being and cognitive function.

The project stands out due to its rigorous track record. Notably, studies like Attanasio et al. (2021) rigorously assess the effects of training on disadvantaged youth in a middle-income setting through randomized controlled trials (RCTs). Moreover, Barrera-Osorio's (2020) investigation into skills training in Colombia reveals substantial positive impacts over short and medium durations. Additionally, Crépon et al. (2021) conduct an experimental study on counseling for social aid beneficiaries, further enriching the project's empirical foundation.

Furthermore, the study by Martinez-Alcalá (2018) highlights how digital training systems integrating multimedia learning activities and materials yield superior outcomes compared to traditional methods. Similarly, Tsai et al. (2017) underscore the significance of social support and hands-on experimentation in acquiring digital skills. Findings from 21 in-depth interviews reveal that social support plays a pivotal role in enhancing tablet management, while experimentation with devices is crucial for gaining technological proficiency. Additionally, Choudhary and Bansal (2022) conducted a comprehensive review of digital training programs, illustrating a range of impacts influenced significantly by service quality and program structure.

1.2 Target population and territorial scope

The intervention targets individuals receiving minimum insertion incomes in various forms: beneficiaries of the Minimum Income Scheme (MIS), recipients of the Basic Social Wage (SSB), and those receiving both forms of support aged 18 years and above.

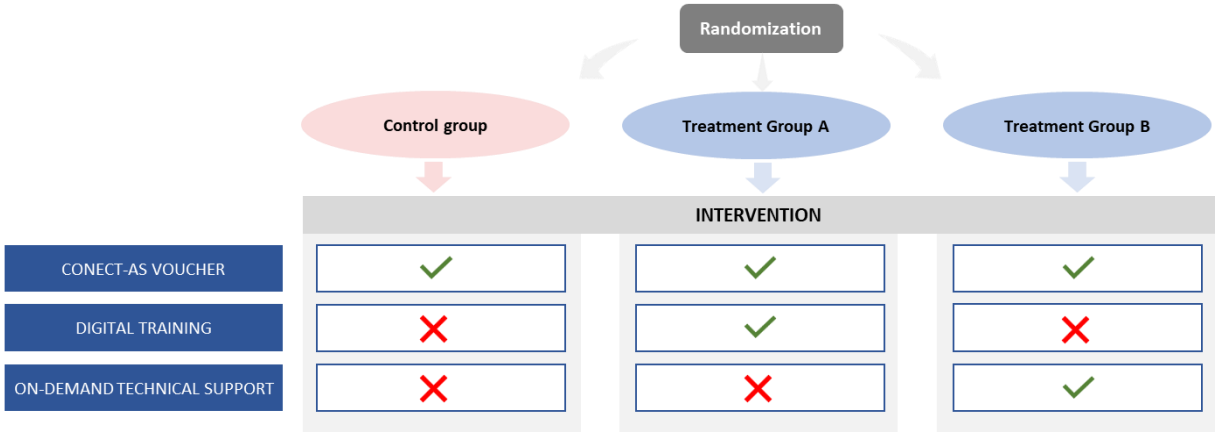
In terms of geographical coverage, the project involves the participation of Local Entities by establishing Local Technological Dynamization Centers (CDTL) and similar facilities across all 78 municipalities within the Principality of Asturias. Staff members at these centers were specifically trained as part of the project.

Further details on the recruitment process are provided in **section 3.5,** as part of the evaluation design.

1.3 Description of interventions

All participants in the project receive the CONECT-AS voucher, which provides financial assistance of €1,000 for the acquisition of a laptop and/or Internet connection, available for a maximum period of 12 months. Additionally, the project offers two distinct services aligned with their respective Treatment Groups. Treatment Group A will engage in a participatory and hands-on face-to-face itinerary, while Treatment Group B will access on-demand support and advice through local community devices. **Figure 6** provides a summary of the interventions corresponding to each group.

Figure 6: Scheme of interventions according to experimental group



The services provided to the treatment groups are detailed as follow:

Digital training program

The training program aims to provide comprehensive digital skills training while emphasizing social inclusion as dual priorities in socio-educational intervention. These sessions integrate socio-educational aspects and soft skills development for effective social integration alongside practical exercises in electronic administration and activities essential to digital citizenship.

Conducted in small groups of six individuals across the Principality of Asturias, the itineraries focus heavily on practical learning experiences. Content is structured to equip participants with digital skills necessary for independently accessing social benefits, engaging fully with public administrations, and exercising their rights in participatory governance processes. The itineraries also employ participatory evaluation methodologies to assess e-government services.

Regarding its duration, the participatory and practical accompaniment itinerary is expected to span a maximum of 60 hours in face-to-face mode, spread over approximately three months. This period includes the entire evaluation process, which beneficiaries are required to attend, along with the completion of a final assessment. The itinerary is conducted by the Tragsatec training team, supported by social facilitators and training assistants.

The accompaniment itinerary will seek to ensure that participants acquire the five basic skills of digital inclusion:

- Information Management: Utilize a search engine to retrieve information, revisit a previously visited website, or download and save a photo from the internet.
- Communication: Send a personal message through email or an online messaging service.
- Transactions: Conduct purchases of goods or services through websites, or purchase and install applications on a digital device.
- Troubleshooting: Verify the credibility of online information sources or resolve issues with digital devices or services using online resources.
- Fill out online forms or create new content from existing online images, music, or videos.

The methodological approach centers around utilizing engaging and supportive learning tools such as Gamification, Peer-to-Peer Collaborative Learning, Project-Based Learning (PBL), Service Learning, and Microlearning modules. This approach prioritizes both attitudinal development and social participation, enabling participants to effectively exercise their digital citizenship rights with a strong emphasis on interpersonal connections and community engagement.

The session content is designed based on the European Digital Competence Framework (DigComp) and its various proficiency levels[7]. This framework serves as the foundation, focusing on learning through essential competencies and cognitive skills, which are assessed using operational descriptors.

The program consists of 24 sessions, each structured into stages using a dynamic and participatory methodology that places the individual at the center. It incorporates elements such as avatars (like Tin@, who accompanies participants throughout the itinerary), badges (awards for completing challenges related to each key competency), a personal timeline (showing progress at the start of each session), and immersion in the itinerary through Tin@'s storytelling, which guides the gamification process.

[7] Within the digital social inclusion itineraries, only competencies corresponding to the basic level of the DigComp framework are addressed, given the diverse composition of groups resulting from necessary randomization.

The standardized structure enhances learning through participants' internalization of routines and ensures consistency in session development across all planned locations. This approach aims to facilitate measurement and evaluation within the RCT model. Furthermore, all audiovisual and digital materials adhere to methodological guidelines and the project's corporate image, prioritizing clear communication and accessibility standards for individuals with diverse abilities.

Each session will be supported by a methodological guide designed for the training team, which includes a social integrator and an assistant. The assistant, who is a person receiving minimum income and possesses basic digital skills, assists the social integrator throughout the sessions. This role is aimed at serving as a role model for participants in the socio-educational intervention, emphasizing the cooperative peer-to-peer learning methodology.

This methodology comprehensively outlines learning objectives, content, competencies addressed, data collection tools (or records), proposed activities, and evaluation criteria using operational descriptors. Furthermore, beneficiaries receive ongoing access to supportive materials throughout the sessions to enhance their learning experience:

1. A PowerPoint presentation that will support its development from start to finish, and in which the different contents will appear introduction icons, videos, screenshots, the history of Tin@ etc.
2. Expanded content to consult or download in person or deferred.
3. Videos, animations, and audiovisual material adapted for people with differentiated abilities.

The sessions are structured into sections with a dual objective: to provide a temporal framework and to standardize the delivery of training as much as possible. This standardization is particularly crucial for the research underpinning the entire face-to-face itinerary. Each section is equipped with keywords or descriptors to guide the integrator through a logical sequence.:

1. Greeting and welcome.
2. Progress bars.
3. Feedback from the previous session.
4. Introduction to today's topic.
5. Development of the training pill (microlearning).
6. Reward: message and positive reinforcement.
7. Feedback and evaluation.
8. Sharing.
9. Reminder for the next session.

It's important to note that the itinerary's content is predominantly practical, where theory serves as a support and context for hands-on practice, which is the primary focus. This approach allows beneficiaries to gain practical experience that directly relates to their daily lives. Additionally, the

itinerary includes activities to promote self-awareness, encouraging individuals to recognize their potential, set personal goals, and develop resilience, such as collaborative group tasks or relaxation exercises.

Practical activities take the form of project-based learning, offering a learning environment where individuals explore possibilities, actively participate throughout the process, and make decisions independently. Participants engage in real-life challenges such as scheduling or modifying appointments with Astursalud, applying for a work history, reviewing income tax filings, accessing the citizen folder, or renewing job applications. These challenges are tackled in groups, supported by the social integrator and training assistant, encouraging participants to draw their own conclusions. Moreover, the itinerary balances individual and group activities, emphasizing cooperation and group cohesion.

Additionally, participants in treatment group A may receive occasional remedial tutorials (for justified absences) or reinforcement sessions (for individuals having trouble keeping pace with the itinerary), distinct from the approach taken with treatment group B.

On-demand support

On-demand support and advice are provided through local community devices, structured around technological nodes such as Local Technological Dynamization Centers provided by municipalities and other community devices across the region. This technical assistance ensures participants have access to specialized technicians[8] who can address queries related to electronic procedures or the use of digital media in their personal lives.

To encourage participants assigned to Treatment Group B to use this service, each will receive a list of 23 topics to address in on-demand tutoring[9]. These topics will coincide with the didactic objectives of the accompaniment itinerary. In this way, linking with the scientific objectives previously exposed, it is intended to verify whether better or worse results are obtained in terms of reducing the digital skill gap with this modality of on-demand assistance with respect to receiving a face-to-face and guided assistance itinerary.

[8] The on-demand tutorials have been taught entirely by social educators from the Tragsatec training team.

[9] People were contacted by telephone to inform them of the start of on-demand tutorials and the topics available, as well as the application process for them through the different channels. In addition, all the information was published on the project's website.

2 Evaluation design

This section describes the design of the impact assessment of the projects outlined in the preceding section. The section describes the Theory of Change, which identifies the mechanisms and aspects to measure, the hypotheses to test in the evaluation, the sources of information to build the indicators, and the design of the experiment.

2.1 Theory of Change

This report, with the aim to design an evaluation that enables understanding the causal relationship between the intervention and its final objective, develops a Theory of Change. The Theory of Change schematizes the relationship between the needs identified in the target population, the benefits, or services that the intervention provides, and the immediate and medium-long term results sought by the intervention. It explains the relationships between these elements, the assumptions underlying them, and outlines measures or outcome indicators.

Theory of Change

A Theory of Change begins with the correct identification of the needs or problems to be addressed and their underlying causes. This situational analysis should guide the design of the intervention, i.e., the activities or products that are provided to alleviate or resolve the needs, as well as the processes necessary to properly implement the treatment. Next, this theory identifies the expected effects based on the initial hypothesis, i.e., what changes – in behavior, expectations, or knowledge – are expected to be obtained in the short term with the actions conducted. Finally, the process concludes with the definition of the medium- to long-term results that the intervention aims to achieve. Sometimes, the effects directly obtained with the actions are identified as intermediate results, and one identifies the indirect effects in the final results.

The development of a Theory of Change is a fundamental element of impact evaluation. At the design stage, the Theory of Change helps to formulate hypotheses and identify the indicators needed for the measurement of results. Once the results are achieved, the Theory of Change makes it easier, if results are not as expected, to detect which part of the hypothetical causal chain failed, as well as to identify, in case of positive results, the mechanisms through which the program works. Likewise, the identification of the mechanisms that made the expected change possible allows a greater understanding of the possible generalization or not of the results to different contexts.

Therefore, based on the Theory of Change framework described, a specific logical sequence of impact is proposed for the CONECT-AS project. The initial problem is the presence of a digital skill gap that affects individuals in vulnerable situations, compromising their equal access to educational, labor, and social opportunities, as well as their full participation in today's digital society. This disparity in access and technological skills highlights the necessity of implementing inclusive measures to bridge this gap and promote equal opportunities in an increasingly digitalized environment. The project's

implementation aims to address this issue, striving to create a cascade effect from the initial actions and resources to achieve significant impacts on the participants' capacity and use of digital media.

In this context, the project offers a series of activities or inputs. Group A participants benefit from a face-to-face training itinerary with comprehensive support. Treatment Group B has access to on-demand support and counseling tutorials in community facilities to address queries about electronic processing or the use of digital media in their private lives.

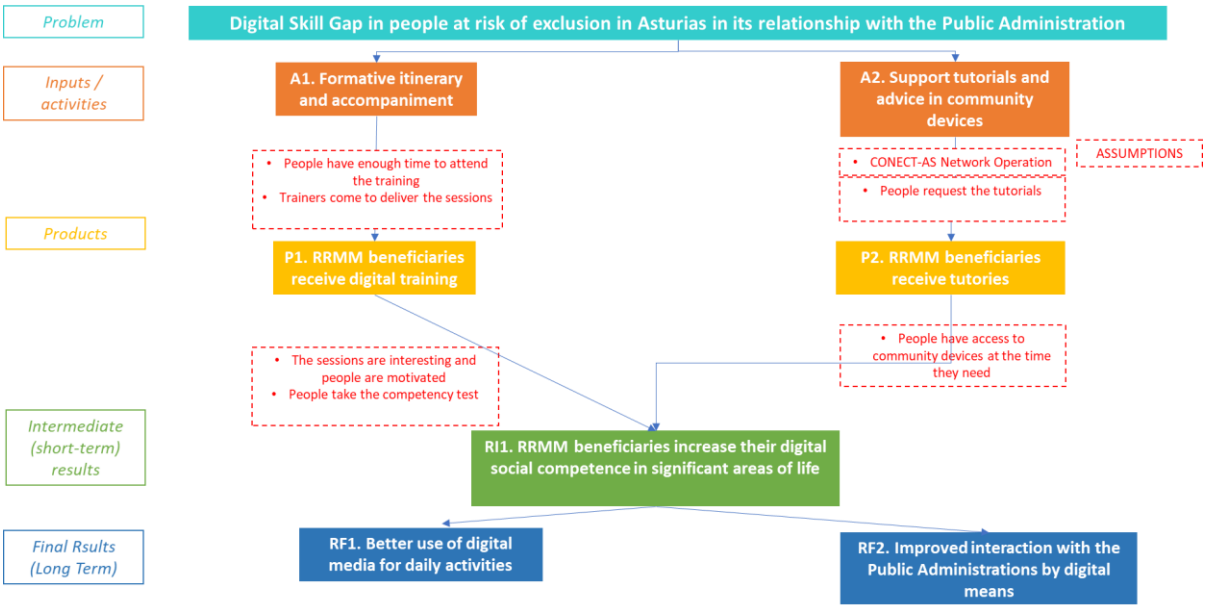
All these resources and activities yield a set of outputs. By measuring the outputs obtained, it is possible to determine whether and to what extent beneficiaries have received the activities or inputs. Proper reception of the resources and activities performed is essential for the program to achieve the expected intermediate and final results. If beneficiaries do not effectively receive the program, it is difficult to observe improvements in the indicators of employment, housing situation or quality of life.

In this project, the outputs are defined as the number of Minimum Income beneficiaries who receive socio-digital training and the number of Minimum Income beneficiaries who receive mentoring. To achieve short-term or intermediate results, a series of assumptions must be met. For the first activity, the sessions must be interesting, participants must be motivated, and they must take the competency test. For the second activity, participants must have access to community devices when needed. Once these assumptions are met, it is expected that the intermediate results will show an increase in socio-digital skills among Minimum Income beneficiaries in significant areas of life.

According to the Theory of Change, the expected results are increased competence in utilizing digital media for everyday tasks and better engagement with Public Administrations via digital platforms, thus addressing the digital skills gap.

The following figure illustrates this causal sequence of actions, initiated by the identified needs or problems and activities and resources necessary to obtain the expected changes in the participants.

Figure 7: Theory of Change



2.2 Hypothesis

To develop innovative, evidence-based policy strategies, it is crucial to test the efficiency and effectiveness of the implemented measures by evaluating their alignment with the initially set objectives.

To assess the project's outcomes, hypotheses regarding its impact on digital skills, application across different environments, and digital interactions with public administration are proposed. These hypotheses are tested through the analysis of data collected during the project's implementation.

The hypotheses to be tested are outlined below:

Increased digital social competence in significant life domains

The main hypothesis to be tested is that treatments, whether the accompaniment itinerary or complementary technical assistance, improve the level of digital skills.

Better use of digital media for daily activities

This hypothesis consists of testing whether the treatments applied to participants in Group A and Group B improve the use of digital media for daily activities. In addition, secondary hypotheses are proposed about the effects of the treatments on the participants, considering the increase in the frequency of Internet use and the increase in interest in expanding knowledge about the Internet and e-Administration.

Improved interaction with the Public Administrations by digital means

The primary hypothesis under investigation assesses whether the treatment enhances interaction with Public Administrations through digital means, focusing on evaluating its impact. Additionally, secondary hypotheses examine the effects of the treatments on participants concerning potential enhancements in their digital identity, increased utilization of online processing for modifying SSB and/or MIS files, and heightened recognition of advantages associated with electronic processing.

2.3 Sources of information

To evaluate and contrast the proposed hypotheses, a survey serves as the main evaluation method. This survey is carried out prior to the experiment (January 2023) and after its completion (October 2023). Additionally, a test is administered at the end of the intervention to assess digital skills.

- **Questionnaire:** This form must be completed by project participants before and after the intervention. It aims to gather detailed information about various aspects related to participants' internet access and usage. The questionnaire covers home device availability, internet connectivity, digital skills, online interactions with public administration, and includes a digital identity assessment. It also explores participants' willingness to enhance their knowledge of internet use and e-government. The questionnaire can be completed online, printed it, and submitted to the Basic Social Wage Service and other economic benefits through usual channels. Alternatively, it can be downloaded, completed on paper, and sent to the relevant institutions. At the conclusion of the intervention, participants may also complete the questionnaire by filling out a form Forms, accessing Teams using their personal username and password on the Interconnects platform.
- **CONECT-AS test**: Following the intervention, participants are required to complete a practical exam designed to assess their digital competencies. The exam consists of three exercises. In the first exercise, participants are tasked with conducting an online search for specific information, copying a link, and capturing a screenshot. The second exercise involves sending an email with precise instructions and attaching the previously captured screenshot. The third exercise entails completing an online form that assesses their proficiency in various digital tasks. These exercises are designed to gauge participants' ability to perform common digital activities such as information retrieval, email communication, and online form completion. The test is distributed electronically, and participants are expected to complete it digitally. Evaluation details are publicly accessible on the program's website, and participants can submit their responses through an online form.

2.4 Indicators

This section describes the indicators used for the impact assessment of the pathway, divided by themes related to the hypotheses described above.

The data extracted from the sources is pivotal as it constitutes a valuable dataset used to generate indicators. These indicators are essential for evaluating the project, providing quantitative measures that facilitate the analysis and validation of the hypotheses put forward.

Increased digital social competence in significant life domains

Digital skills: The CONECT-AS test score serves as a measure of participants' digital skills post-treatment, whether through the structured accompaniment itinerary or the supplemental on-demand support and advice. This indicator is graded on a scale of 0 to 6, based on the number of exercises completed correctly, with each correct answer contributing one point.

Better use of digital media for daily activities

Task index: The enhancement in daily digital media usage is assessed using a synthetic indicator based on participants' self-reported execution of 18 specific computer tasks over the preceding three months. Tasks range from writing texts and creating folders to utilizing spreadsheets and engaging in online activities such as social networking, job searching, and accessing banking services. The indicator aggregates normalized affirmative responses, scored on a scale from 0 to 1.

Internet use index: This is a synthetic indicator that is derived from three questions focused on the time spent by the participant using the internet. The questions inquire about: (i) the frequency of internet use in the last three months; (ii) whether the internet is used multiple times a day; and (iii) how many hours a day the internet is used. This indicator has a range of 0 to 1, increasing in value as the Internet is used more frequently.

Interest learning: Another synthetic indicator, calculated as the average of the answers to four questions that assess the participant's interest in expanding their knowledge of the daily use of the computer, the management of online procedures with the Administration, the improvement of knowledge through the Internet and the making of online purchases. The possible values for these answers are: "Nothing", "Little" and "A lot". The synthetic index is normalized, so it takes values between 0 and 1, where 1 represents the highest level of interest.

means Improved interaction with the Public Administrations by digital means

Online interaction public admin.: To measure the progress in participants' digital interactions with Public Administrations, a composite indicator is utilized. This metric is derived from participants' answers to 13 questions assessing their involvement in administrative activities during the preceding three months. These activities include tasks like scheduling appointments, filing complaints, accessing information on benefits, and executing online transactions with Public Administrations, such as form downloads and social benefit applications. The indicator's score is determined by aggregating normalized affirmative responses, ranging from 0 to 1.

Digital identity: This indicator is calculated based on the participants' answers to 3 questions about the digital certificate, the cl@ve system and the electronic DNI, where they must answer whether they know it and/or have it and/or use it. This indicator is calculated as the average of three dichotomous

variables that take value 1 when each of the digital identities is available and/or used. It therefore has a range from 0 to 1, increasing in value as more means are available and/or used for digital identity.

Online interaction MIS: This indicator is calculated from the participants' response to a question about the possible communication of a change in their SSB or MIS file, where they must answer whether they would do it in person or online. This indicator takes the values 0 if they choose the face-to-face option, and 1 if they choose the online option.

Advantages online public admin.: A synthetic indicator derived from questionnaire responses, it encompasses aspects like time efficiency, increased availability, and enhanced convenience in accessing procedures. Calculated as the normalized sum of affirmative answers (with responses limited to "Yes" or "No" across four questions), this indicator ranges from 0 to 1, with higher values indicating greater perceived benefits

2.5 Design of the experiment

To assess the effect of the treatment on each of the previously mentioned indicators, this study uses an experimental evaluation (RCT), in which participants are randomly assigned to either the treatment or the control group. The recruitment and selection process of the beneficiary families for the intervention, as well as the random allocation and the temporal framework of the experiment, are detailed below.

Recruitment intervention beneficiaries

Recruitment for the project commences with a public call published in the Boletín Oficial of the Principality of Asturias. Each household unit is encouraged to designate one participant, with the decision-making process entrusted to the household itself.

Leading up to and during the application period, intensive efforts are focused on raising awareness and promoting the project. These efforts are meticulously planned and executed by technical assistance (Tragsatec) and detailed in a Communication Plan. The strategic initiatives outlined in this plan are divided into two primary categories:

- Online initiatives, involving presence on institutional websites, website creation, and engagement on social media platforms
- Offline initiatives, featuring an advertising campaign on street furniture and public transportation, engagement with key stakeholders, technical seminars, media relations, and an informational campaign conducted via telephone communications.

Furthermore, throughout the entire application phase, technical teams comprising social educators and social facilitators are strategically deployed across the region in two configurations: “Puntos Conect-As" fixed points of continuous attention and “Equipos Conect-As” of itinerant character. This deployment ensures direct, in-person assistance for all applicants and includes informational sessions on the characteristics of the project, eligibility criteria, and participation obligations. The goal is to minimize potential biases arising from differences in participants' digital proficiency levels.

Informed consent

One of the fundamental ethical principles of research involving human beings (respect for people) requires study participants to be informed about the research and consent to be included in the study. Informed consent is usually part of the initial interview and has two essential parts: the explanation of the experiment to the person, and the request and registration of their consent to participate. Consent should begin with a comprehensible presentation of key information that will help the person make an informed decision, i.e., understand the research, what is expected of it, and the potential risks and benefits. Documentation is required as a record that the process has taken place and as proof of informed consent, if so.

Informed consent is required in most research and may be oral or written, depending on different factors such as the literacy of the population or the risks posed by consent. Only under very specific circumstances, such as when the potential risks to participants are minimal and the informed consent is very complex to obtain or would harm the validity of the experiment, informed consent may be avoided, or partial information may be given to participants with the approval of the ethics committee.

Random assignment of participants

After completing the recruitment phase, the allocation process aims to evenly distribute participants among three groups: Treatment Group A (Group A), Treatment Group B (Group B), and Control Group (Group C). To ensure diversity across rural, urban, and semi-urban contexts, the selection process is stratified into two distinct categories.

- Line 1: Intended for people residing in a municipality of the Principality of Asturias with more than 20,000 inhabitants (Oviedo, Gijón, Avilés, Siero, Langreo, Mieres and Castrillón).
- Line 2: Intended for people residing in a council of the Principality of Asturias with less than 20,000 inhabitants.

To ensure an unbiased allocation of participants from the two strata into the groups, a random assignment system is employed. Randomization is crucial in RCTs to ensure statistical comparability between treatment and control groups, accounting for both observable and unobservable variables. This uniformity establishes the foundation necessary for an accurate evaluation of the intervention's effects. The random assignment procedure adheres to the following framework:

1. Initially, a list is compiled containing all eligible applications sorted in ascending order based on the last four digits of the applicant's DNI or NIE, arranged in reverse order. This means the last digit becomes the first, the second-to-last becomes the second, the third-to-last becomes the third, and the fourth-to-last becomes the fourth. Two lists are prepared: one for Line 1 and another for Line 2.
2. Following this, participants are assigned to Group A, Group B, or Group C, beginning with the initial applicant on each list whose reversed last four digits of the DNI or NIE are 22 or greater, aligning with the year 2022 when the regulatory guidelines were issued.

The process of assigning Groups A, B, and C mentioned in the previous section is repeated in a sequential manner, until the end of the list of the total number of people, starting with the next person, who will be assigned to Group A, and so on.

Figure 8: Sample design

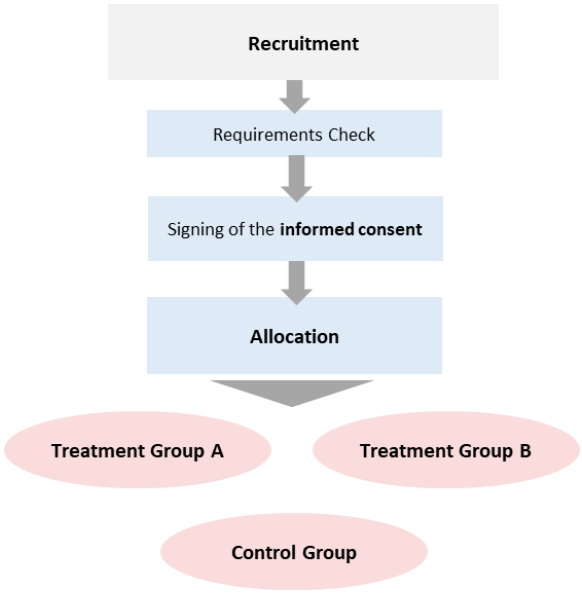
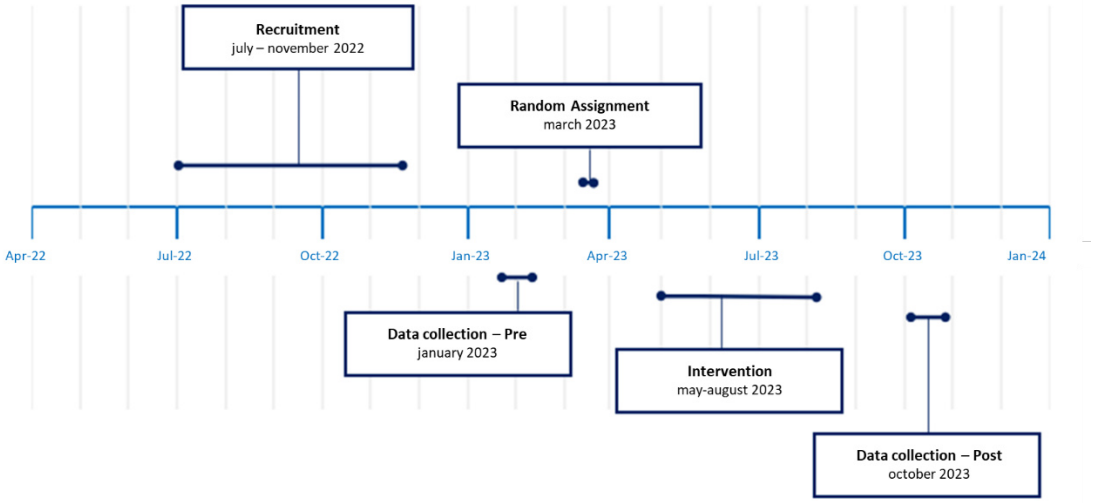


Figure 9 outlines the chronological sequence of implementation and evaluation phases. Recruitment occurs between July and November 2022. The baseline survey, conducted in January 2023, captures participant data pre-intervention. By March 2023, participants are assigned to Treatment Group A, Treatment Group B, or the Control Group. The itinerary runs from May to August 2023, followed by post-intervention data collection in October 2023.

Figure 9: Implementation and evaluation timeframe



3 Description of the implementation of the intervention

This section describes the practical aspects of how the intervention was implemented, within the framework of the evaluation design. Describe the results of the participant recruitment process and other relevant logistical aspects to contextualize the results of the evaluation.

3.1 Sample Description

Despite extensive efforts in dissemination, communication, and outreach initiatives such as deploying Conect-As points, engaging key stakeholders, and conducting on-demand information sessions, the registration rate falls below anticipated levels. Therefore, there is a pressing need for intensified communication and direct outreach efforts aimed at the entire targeted population of the project.

Since the launch of the telephone contact information campaign, a total of 17,718 calls have been made to potential participants sourced from lists provided by the MISSM, encompassing beneficiaries of the Basic Social Wage and the Minimum Income Scheme. **Table 1** outlines the outcomes derived from this recruitment initiative.

Table 1: Record of the telephone recruitment process

Total number of calls	17,718
Unanswered calls	10,400
Interested persons	3,495
Non-interested persons	2,220
People who were already enrolled	716
People who claimed the phone was wrong (it wasn't their number)	487
People who did not meet the requirements	317
Candidates who did not have a contact telephone number	115
People who asked not to be contacted again	70

After the end of the application period, a new round of calls is made, contacting 2,887 people to obtain information about their interest in participating in the project in the event of opening a new application submission period, with a total of 1,184 people expressing interest.

Finally, the figures of people on the final lists show data of 1,723 applications admitted, 352 applications excluded, and 184 applications withdrawn.

Characteristics of the final sample of the evaluation

Of the 1,723 applications admitted, 1,654 successfully completed the initial survey, meeting all requirements. These participants were then randomly assigned to the three intervention groups, and the results of this randomization were published in the Boletín Oficial of the Principality of Asturias No. 68 (BOPA) on 11-04-2023.

Table 2 presents descriptive statistics of the variables related to the intervention based on the data collected in the baseline survey. Approximately 69% of the participants are female, with an average age of 46 years. On average, participants have completed 11 years of education, roughly equivalent to a high school diploma. The average household comprises about 2.3 members, including 0.7 children. Around 51% of participants receive the Minimum Income Scheme (MIS), and 67% receive the Basic Social Wage (SBB). Most participants reside in urban areas (73%).

All participants indicate owning a mobile phone, with one-third reporting having a computer at home and one-fifth possessing a tablet. Moreover, the vast majority, approximately 92%, have access to the Internet at home. Regarding internet access, around two-thirds of participants use a fixed connection, while one-third use their mobile device to access the internet.

Participants reported their use of digital devices over the previous three months, with approximately half using a computer and a quarter using a tablet. Their proficiency with these devices was assessed using a scale where low ability was assigned a value of zero, medium ability 0.5, and high ability 1. On average, participants reported higher proficiency with mobile phones (0.89), while proficiency with tablets and computers averaged around 0.65 each.

Table 2 also presents the outcome indicators of the study. The average value of the Internet use frequency index is 0.48. Concerning the perceived advantages of electronic processing, the average value is 0.91, indicating that most participants find online interactions convenient. Additionally, participants demonstrate a strong interest in learning, with an average value of 0.79 at the beginning of the study.

The average value of the Task Index is 0.59, which corresponds to approximately 11 of the 18 tasks. On the other hand, the online interactions with the Public Administration indicator, on average, has a value of 0.37, which shows that the average participant has performed 5 of the 13 tasks considered.

Finally, the average value of the index that measures digital identity is 0.31 and approximately 39% of participants select the online option to make changes to the SSB/MIS file, compared to 61% who prefer to do so in person.

Table 2: Descriptive statistics of the sample

Variable	N	Mean	Std. deviation.	Min	Max
Key features					
Female	1639	0.69	0.46	0	1

Variable	N	Mean	Std. deviation.	Min	Max
Age	1653	46.17	11.29	18	93
Urban area	1654	0.73	0.44	0	1
Education	1644	11.03	3.17	5	20
Household Size	1599	2.27	1.21	1	8
Children at home	1597	0.73	0.93	0	5
MIS recipient	1654	0.51	0.50	0	1
SSB recipient	1654	0.67	0.47	0	1
Computer	1623	0.32	0.47	0	1
Tablet	1603	0.22	0.42	0	1
Mobile phone	1650	1.00	0.05	0	1
Internet connection	1644	0.92	0.27	0	1
Fixed connection	1644	0.65	0.48	0	1
Mobile connection	1644	0.34	0.47	0	1
Computer use	1598	0.48	0.50	0	1
Use of tablet	1586	0.23	0.42	0	1
Computer skills	1640	0.65	0.36	0	1
Tablet skills	1617	0.64	0.39	0	1
Mobile skills	1644	0.89	0.22	0	1
Outcome indicators (pre-intervention)					
Internet use index	1635	0.48	0.31	0	1
Advantages of online public admin.	1649	0.91	0.24	0	1
Interest learning	1647	0.79	0.26	0	1
Task index	1653	0.59	0.22	0	1
Online interaction public admin.	1653	0.37	0.32	0	1
Digital identity	1649	0.31	0.74	0	1
Online interactions MIS	1639	0.39	0.49	0	1

3.2 Random Assignment Results

Once the sample has been defined, the participants are randomly assigned. Table 3 displays the results of the random assignment, detailing the number of participants assigned to each group.

Table 3: Random Assignment Result

	Urban area	Rural area	Total
Treatment A	402	150	**552**
Treatment B	402	150	**552**
Control group	401	149	**550**
Total	**1,205**	**449**	**1,654**

To ensure the random assignment effectively creates statistically comparable Control Group, Treatment Group A, and Treatment Group B, a balance test is conducted. This test aims to verify that, on average, the observable characteristics of participants across all groups are similar. Achieving balance between the experimental groups is crucial for accurately inferring the causal effect of the program through comparative analysis of its outcomes.

To assess the comparability of the treatment and control groups, balance tests are conducted on the variables previously described, which were collected during the initial survey. **Tables 4 and 5** display the results of these tests, showing the average value of each variable for each group and the corresponding p-value derived from a mean difference test using Student's t-statistic

Table 4 compares Treatment Group A with the Control Group, while **Table 5** presents the results comparing Treatment Group B with the Control Group. These tables display data from the survey conducted before the intervention, including the mean value of each variable for the groups compared, the number of observations in each group, and the p-value resulting from a test of mean difference. A lower p-value indicates stronger evidence against the hypothesis that the means of the variables in both groups are equal.

No systematic differences were observed between individuals assigned to Treatment A and the Control Group, nor between individuals in Treatment Group B and the control group (see **Table 4** and **Table 5**). Of the approximately 30 variables considered, a significant difference at the 5% level is observed between Treatment Group A and the control group in the characteristic of computer ownership, and between Treatment Group B and the control group in the characteristic of internet connection. Additionally, there is a marginally significant difference in the probability of receiving the MIS ("MIS beneficiary" variable). These variables are included as controls in the analyses.

Table 4: Balance test between experimental groups (Treatment Group A)

	Mean				Observation		
	Control	**Treatment**	**Dif.**	**P-value**	**Total**	**Control**	**Treatment**
Sociodemographic variables (pre-intervention)							
Female	0.68	0.69	0.01	0.63	1091	545	546
	(0.02)	(0.02)					
Age	46.37	46.02	-0.35	0.61	1101	550	551
	(0.49)	(0.49)					
Urban	0.73	0.73	0	0.98	1102	550	552
	(0.02)	(0.02)					

	Mean				Observation		
	Control	Treatment	Dif.	P-value	Total	Control	Treatment
Education	11.05	11.17	0.12	0.5	1096	547	549
	(0.13)	(0.13)					
Household Size	2.22	2.29	0.07	0.36	1067	538	529
	(0.05)	(0.05)					
Number of children at home	0.75	0.73	-0.02	0.66	1066	538	528
	(0.04)	(0.04)					
MIS Beneficiary	0.53	0.53	0	0.91	1102	550	552
	(0.02)	(0.02)					
SSB Beneficiary	0.68	0.64	-0.04	0.18	1102	550	552
	(0.02)	(0.02)					
Computer	0.29	0.35	0.06	0.03**	1085	540	545
	(0.02)	(0.02)					
Tablet	0.22	0.22	0	0.92	1073	535	538
	(0.02)	(0.02)					
Mobile phone	1.00	1.00	0	0.56	1100	549	551
	(0.00)	(0.00)					
Internet connection	0.91	0.92	0.01	0.69	1094	549	545
	(0.01)	(0.01)					
Fixed Internet connection	0.66	0.64	-0.02	0.43	1094	549	545
	(0.02)	(0.02)					
Mobile connection to Internet	0.32	0.35	0.03	0.39	1094	549	545
	(0.02)	(0.02)					
Computer use	0.48	0.48	0	0.83	1067	534	533
	(0.02)	(0.02)					
Use of tablet	0.24	0.23	-0.01	0.74	1058	530	528
	(0.02)	(0.02)					
Computer skills	0.65	0.66	0.01	0.66	1092	545	547
	(0.02)	(0.02)					
Tablet skills	0.64	0.64	0	0.91	1079	534	545
	(0.02)	(0.02)					
Mobile skills	0.88	0.90	0.02	0.18	1095	546	549
	(0.01)	(0.01)					
Internet use index	0.48	0.47	-0.01	0.74	1092	547	545
	(0.01)	(0.01)					
Advantages online public admin.	0.90	0.91	0.01	0.46	1100	550	550
	(0.01)	(0.01)					
Interest learning	0.79	0.77	-0.02	0.27	1098	550	548
	(0.01)	(0.01)					
Task index	0.59	0.59	0	0.67	1102	550	552
	(0.01)	(0.01)					
Online interaction public admin.	0.37	0.38	0.01	0.62	1102	550	552
	(0.01)	(0.01)					
Digital identity	0.32	0.31	-0.01	0.61	1099	549	550

	Mean				Observation		
	Control	Treatment	Dif.	P-value	Total	Control	Treatment
	(0.01)	(0.01)					
Online interactions MIS	0.39	0.39	0	0.88	1092	549	543
	(0.02)	(0.02)					

Note: The table compares the baseline characteristics of individuals assigned to Treatment Group A and individuals assigned to the control group. The last column gives the p-values of an equality of means test for the corresponding variable. The p-values have the following levels of significance: *p<0.1, **p<0.05, ***p<0.01. Standard robust errors in parentheses.

Table 5: Balance test between experimental groups (Treatment Group B)

	Mean				Observations		
	Control	Treatment	Dif.	P-value	Total	Control	Treatment
Sociodemographic variables (pre-intervention)							
Female	0.68	0.69	0.01	0.70	1093	545	548
	(0.02)	(0.02)					
Age	46.37	46.11	-0.26	0.70	1102	550	552
	(0.49)	(0.46)					
Urban area	0.73	0.73	0	0.98	1102	550	552
	(0.02)	(0.02)					
Education	11.05	10.87	-0.18	0.37	1095	547	548
	(0.13)	(0.14)					
Household Size	2.22	2.30	0.08	0.31	1070	538	532
	(0.05)	(0.05)					
Number of children at home	0.75	0.71	-0.04	0.47	1069	538	531
	(0.04)	(0.04)					
MIS Beneficiary	0.53	0.48	-0.05	0.09*	1102	550	552
	(0.02)	(0.02)					
SSB Beneficiary	0.68	0.68	0	0.97	1102	550	552
	(0.02)	(0.02)					
Computer	0.29	0.33	0.04	0.17	1078	540	538
	(0.02)	(0.02)					
Tablet	0.22	0.23	0.01	0.55	1065	535	530
	(0.02)	(0.02)					
Mobile phone	1.00	1.00	0	1.00	1099	549	550
	(0.00)	(0.00)					
Internet connection	0.91	0.94	0.03	0.04**	1099	549	550
	(0.01)	(0.01)					
Fixed Internet connection	0.66	0.66	0	0.92	1099	549	550
	(0.02)	(0.02)					
Mobile connection to Internet	0.32	0.35	0.03	0.46	1099	549	550
	(0.02)	(0.02)					
Computer use	0.48	0.49	0.01	0.65	1065	534	531
	(0.02)	(0.02)					
Use of tablet	0.24	0.23	-0.01	0.69	1058	530	528

	Mean				Observations		
	Control	Treatment	Dif.	P-value	Total	Control	Treatment
	(0.02)	(0.02)					
Skills with the computer	0.65	0.65	0	0.74	1093	545	548
	(0.02)	(0.02)					
Tablet skills	0.64	0.63	-0.01	0.75	1072	534	538
	(0.02)	(0.02)					
Mobile skills	0.88	0.89	0.01	0.44	1095	546	549
	(0.01)	(0.01)					
Internet use index	0.48	0.50	0.02	0.33	1090	547	543
	(0.01)	(0.01)					
Advantages online public admin.	0.90	0.90	0	0.88	1099	550	549
	(0.01)	(0.01)					
Interest learning	0.79	0.80	0.01	0.25	1099	550	549
	(0.01)	(0.01)					
Task index	0.59	0.58	-0.01	0.69	1101	550	551
	(0.01)	(0.01)					
Online interaction public admin.	0.37	0.37	0	0.96	1101	550	551
	(0.01)	(0.01)					
Digital identity	0.32	0.30	-0.02	0.38	1099	549	550
	(0.01)	(0.01)					
Online interactions MIS	0.39	0.39	0	0.99	1096	549	547
	(0.02)	(0.02)					

Note: The table compares the baseline characteristics of individuals assigned to Treatment Group B and individuals assigned to the control group. The last column gives the p-values of an equality of means test for the corresponding variable. The p-values have the following levels of significance: *p <0.1, **p <0.05, ***p <0.01. Standard robust errors in parentheses.

3.3 Degree of participation and attrition by groups

The group that signs the informed consent group constitutes the experimental sample randomly assigned to the control and treatment groups. However, both participation in the program and response to the initial and final surveys are voluntary. On one hand, it is convenient to analyze the degree of participation in the program, since the estimation of results will refer to the effects on average of offering it, given the degree of participation. For example, if participation in treatment activities is low, the treatment and control groups will be very similar, and it will be more difficult to find an effect. On the other hand, this section tests whether the non-completion of the final survey by some of the participants reduces the comparability of the treatment and control groups after the intervention, if the response rate is different between groups or according to the demographic characteristics of the participants in each group.

Degree of participation

To assess the level of participation, first, it is verified whether participants used the €1,000 grant provided to acquire a computer, depending on their group assignment (**Table 6**), aimed at enhancing

access. Subsequently, the indicators of participation in the training program (**Table 7**) and on-demand assistance (**Table 8**), exclusive to the treatment groups, are analyzed.

Table 6 shows the availability and use of computers by families according to the treatment group, both before starting the intervention and at the end of it. The data reveal that the percentage of participants with computer access triples, from 31% to 96%, while the percentage of participants who have used a computer in the last 3 months increases from 47% to 93%

Table 6*:* Computer availability and use.

	Total Participants		Computer availability		Computer use	
Treatment Group	PRE	POST	PRE	POST	PRE	POST
Treatment Group A	552	460	34%	95%	47%	94%
Treatment Group B	552	464	32%	96%	47%	93%
Control group	550	470	28%	95%	46%	92%
Total	**1654**	**1394**	**31%**	**96%**	**47%**	**93%**

Table 7 presents attendance and participation indicators for training sessions. These sessions have focused on addressing the digital skills gap across three dimensions: utilization, appropriation, and engagement[10]. The itinerary consisted of 23 sessions of 2 hours and 50 minutes each.

According to the experimental design, only participants in Treatment Group A engage in these training sessions. On average, participation in the accompanying itinerary stands at 69%. Furthermore, 54% of participants have shown high-intensity participation by attending 14 or more sessions.

Table 7*:* Participation in accompaniment

Treatment Group A	Total	Null	Low	Medium	High
Urban area	**402**	**128** ***(32%)***	**22** ***(5%)***	**37** ***(9%)***	**215** ***(53%)***
Rural area	**150**	**42** ***(28%)***	**8** ***(5%)***	**18** ***(12%)***	**82** ***(55%)***
Total	**552**	**170** ***(31%)***	**30** ***(5%)***	**55** ***(10%)***	**297** ***(54%)***

Note: Low: less than 7 training sessions; Medium: between 7 and 14 training sessions; High: more than 14 sessions

Table 8 outlines the attendance metrics for on-demand tutorials, which were exclusively available to Treatment Group B participants as per the experimental setup. Results indicate modest utilization, with an average participation rate of 16%. Notably, 13% of participants accessed 1-2 tutorials, 3% engaged in 3-5 sessions, and 1% accessed more than 5 tutorials.

[10] Participation, which has to do with exercising digital citizenship, has been promoted with a micro service-learning project, which consisted of an infographic contest at the Asturian territory. In addition, the evaluation of the 13 websites consulted along the itinerary was carried out in the performance of procedures through a process of informed social participation.

Table 8*: Participation in on-demand tutorials*

Treatment Group A	Total	Null	Low	Medium	High
Urban area	**402**	**334** ***(83%)***	**52** ***(13%)***	**13** ***(3%)***	**3** ***(1%)***
Rural area	**150**	**127** ***(85%)***	**18** ***(12%)***	**5** ***(3%)***	**0** ***(0%)***
Total	**552**	**461** ***(84%)***	**70** ***(13%)***	**18** ***(3%)***	**3** ***(1%)***

Note: Low: 1-2 tutorials on demand; Medium: 3-4-5 tutorials on demand; High: 6-7 tutorials on demand

Attrition

During the itinerary, 35 people withdrew. **Table 9a** shows the casualties produced by treatment group and area.

Table 9a*: Participants who have withdrawn*

Group	Total	Urban area	Rural area
Treatment Group A	**22**	**15**	**7**
Treatment Group B	**7**	**2**	**5**
Control group	**6**	**4**	**2**
Total	**35**	**21**	**14**

Table 9b provides data on participation and response rates for baseline (PRE) and end-line (POST) surveys across both treatment and control groups. All 1,654 randomly assigned individuals completed the initial survey. Of these, 84%, or 1,394 people, also completed the final survey. The completion rate for the end-line survey is consistent across the various groups.

Table 9b: Participants with baseline and endline data

Group	Picked up	PRE survey carried out	POST survey carried out
Total	**1,654**	**1,654** ***(100%)***	**1,394** ***(84%)***
Treatment Group A	**552**	**552** ***(100%)***	**460** ***(83%)***
Urban area	402	402 *(100%)*	336 *(84%)*
Rural area	150	150 *(100%)*	124 *(83%)*
Treatment Group B	**552**	**552** ***(100%)***	**464** ***(84%)***
Urban area	402	402 *(100%)*	346 *(86%)*
Rural area	150	150 *(100%)*	118 *(78%)*
Control group	**550**	**550** ***(100%)***	**470** ***(85%)***
Urban area	401	401 *(100%)*	341 *(85%)*
Rural area	149	149 *(100%)*	129 *(86%)*

Overall, there is no indication that attrition is correlated with participation in any of the treatments. **Table 10** demonstrates that the attrition rates do not significantly vary among the groups. Furthermore, there were no discernible differences between the groups in terms of the baseline characteristics of participants who completed the final questionnaire (see **Table 20 and 21** of the **Annex Sample Attrition – Additional Analyses**).

Table 10: Attrition analysis

	Does not take the test		Does not complete the questionnaire	
	(1)	(2)	(3)	(4)
Treatment A	-0.01	-0.00	0.02	0.03
	(0.03)	(0.03)	(0.02)	(0.02)
Treatment B	0.03	0.04	0.01	0.01
	(0.03)	(0.03)	(0.02)	(0.02)
Remarks	1654	1387	1654	1387
Media Control	0.39	0.38	0.15	0.14
Controls	No	Yes	No	Yes

4 Evaluation results

Randomization of the experimental sample to the control and treatment groups ensures that, with a sufficiently large sample, the groups are statistically comparable and therefore any differences observed after the intervention can be causally associated with the treatment. Econometric analysis provides, in essence, this comparison. However, it has the advantages of allowing other variables to be included to gain precision in estimates and of providing confidence intervals for estimates. In this section, the econometric analysis carried out and the estimated regressions are presented, as well as the analysis of the results obtained.

4.1 Description of Econometric Analysis: Estimated Regressions

In the context of a randomized experiment, the regression model used to estimate causal effects typically compares the treatment group with the control group for the variable of interest. This approach relies on the statistical comparability of both groups achieved through randomization. Given the identified imbalances in baseline characteristics, this analysis also includes regressions that incorporate these variables measured before the intervention. This ensures that any disparities between groups prior to the intervention are considered. Additionally, regressions controlling for the initial value of the dependent variable, where applicable, are included to enhance the precision of the estimates.

Specifically, to estimate the causal impact of the two treatments, the specification of the regressions presented below is the following equation:

$$(1)\ Y_i = \beta_0 + \beta_\alpha treatmentA_i + \beta_b treatmentB_i + yX_i + \gamma Y_{i,pre} + \varepsilon_i$$

where $treatmentA$ and $treatmentB$ are binary variables taking the value of one for individuals assigned to each respective treatment group. The model also incorporates control variables X_i , which include three predetermined variables that exhibited imbalance between the groups: availability of

computers, Internet connection, and beneficiary status of the MIS. Additionally, the model includes $Y_{i,pre}$ the dependent variable measured at the beginning of the project.

4.2 Analysis of the results

4.2.1 Primary and secondary outcomes

This section presents the results of the evaluation on the main indicators following the structure of the evaluation scheme.

1. Digital skills

In relation to the results of the intervention on improving digital skills, **Table 11** presents two specifications: (1) one without controls and (2) one with controls.

The analysis of the impact on the digital skills indicator utilizes the final test scores obtained by all project participants at the intervention's conclusion. In both model specifications, the coefficient linked to Treatment A demonstrates a negative effect, contrary to expectations. Likewise, Treatment B shows a negative impact on the indicator.

Table 11: Effect on digital skills

	Digital skills	
	(1)	(2)
Treatment A	-0.21**	-0.21*
	(0.11)	(0.11)
Treatment B	-0.11	-0.12
	(0.11)	(0.11)
Observation	998	973
R2	0.00	0.02
Control Mean	5.23	5.22
Controls	No	Yes
PRE indicators	No	No

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

2. Use of digital media for daily activities

Table 12 presents the outcomes of the interventions regarding the use of digital media for daily activities. The table includes three specifications: (1) without controls, (2) with controls, and (3) with controls while adjusting for the initial value of the dependent variable (pre-intervention).

The results indicate no significant impacts of the treatments on the primary indicator, which measures the number of computer activities and tasks performed online. There is also no observed

increase in the frequency of Internet use. However, Treatment A shows a positive impact of 0.04 points (5.6%), significant at the 5% level, regarding the interest in expanding knowledge about the Internet and electronic administration compared to the control group. Treatment B, on the other hand, does not show significant differences.

Table 12: Effect on the use of digital media for daily activities

	Computer task index			Internet use index			Interest learning		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment A	0.01	0.01	0.01	0.02	0.02	0.01	0.03*	0.03**	0.04**
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Treatment B	0.00	-0.00	0.01	0.00	-0.00	-0.01	0.02	0.02	0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Observation	1393	1361	1361	1381	1349	1337	1379	1347	1343
R2	0.00	0.05	0.36	0.00	0.02	0.20	0.00	0.00	0.15
Control mean	0.64	0.64	0.64	0.49	0.49	0.49	0.72	0.72	0.72
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
PRE indicators	No	No	Yes	No	No	Yes	No	No	Yes

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

3. Interaction with the Public Administrations by digital means

Table 13 presents three specifications to assess the impact on established indicators regarding the enhancement of interaction with Public Administrations through digital means.

The coefficient linked to Treatment A shows a 0.05-point increase, representing a 13% improvement in the third specification, and it remains statistically significant at the 1% level across all specifications. This suggests that Treatment A effectively increased the volume of online administrative procedures conducted. Conversely, Treatment B shows no significant enhancement compared to the control group in this regard.

Additionally, neither treatment shows significant differences in reported benefits associated with electronic processing. However, Treatment A demonstrates a significant positive effect at 1% on digital identity (including possession or usage of digital certificates, key systems, electronic IDs) and online processing for modifying SSB/MIS files, with increases of 0.23 points (60%) and 0.09 points (17%), respectively, compared to the control group.

Table 13: Effects on interaction with the General Government by digital means

	Online public admin.			Advantages online public			Digital identity			On-line processing SSB/MIS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Treatment A	0.06***	0.06***	0.05***	-0.00	-0.00	-0.01	0.23***	0.22***	0.23***	0.10***	0.10***	0.09***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)

	Online public admin.			Advantages online public			Digital identity			On-line processing SSB/MIS		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Treatment B	0.01	0.01	0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Observation	1394	1362	1362	1387	1356	1354	1392	1360	1356	1368	1338	1327
R2	0.01	0.03	0.27	0.00	0.01	0.05	0.10	0.12	0.24	0.01	0.02	0.07
Control Mean	0.39	0.38	0.38	0.91	0.91	0.91	0.38	0.38	0.38	0.53	0.53	0.53
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
PRE indicators	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

4.2.2 Heterogeneity analysis

Finally, following the pre-registered plan, three heterogeneity analyses are carried out. The estimate calculates whether there is a differential impact of treatments depending on (i) whether the participant lived in an urban or rural area, (ii) their gender, and (iii) their age. In all cases, regression was carried out with controls, including the variables that were not balanced between the groups: computer availability, Internet connection and whether they are beneficiaries of MIS.

Overall, the evidence indicates that the effectiveness of training is similar in rural and urban areas and is not dependent on gender, but there is an age gradient. The dummy variables of urban area (**Table 14** and **Table 15**) and female gender (**Table 16** and **Table 17**) are not significant in any of the outcome indicators considered. In contrast, the interaction between a dummy variable that takes the value one for individuals over 45 years of age (the median age in the sample) and Treatment A is statistically significant at the level of 5% in two cases and at the level of 10% in two additional cases (see **Table 19**), suggesting that older participants benefit more from participating in training.

Table 14: Analysis of Heterogeneity – Urban Status

	Digital skills	Computer task index	Internet use index	Interest learning
Treatment A * Urban	-0.17	0.00	-0.03	-0.03
	(0.27)	(0.03)	(0.04)	(0.04)
Treatment B * Urban	-0.22	-0.01	-0.01	0.00
	(0.27)	(0.03)	(0.04)	(0.04)
Observation	973	1361	1349	1347
R2	0.03	0.05	0.02	0
Media Control	5.22	0.64	0.49	0.72

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 15: Analysis of Heterogeneity – Urban Status

	Online public admin.	Advantages online public	Digital identity	On-line processing SSB/MIS
Treatment A * Urban	-0.01	0.01	-0.05	-0.01
	(0.04)	(0.03)	(0.05)	(0.07)
Treatment B * Urban	0.03	0.03	-0.04	0.04
	(0.03)	(0.03)	(0.05)	(0.07)
Observation	1362	1356	1360	1338
R2	0.05	0.01	0.12	0.03
Control Mean	0.38	0.91	0.38	0.53

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 16: Analysis of Heterogeneity – Gender

	Digital skills	Computer task index	Internet use index	Interest learning
Treatment A* Female	0.20	0.03	-0.00	-0.04
	(0.24)	(0.03)	(0.04)	(0.04)
Treatment B * Female	-0.03	0.01	-0.01	-0.04
	(0.24)	(0.03)	(0.04)	(0.04)
Observation	968	1350	1338	1336
R2	0.02	0.06	0.02	0.01
Control Mean	5.22	0.63	0.49	0.72

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 17: Analysis of Heterogeneity – Gender

	Online public admin.	Advantages online public	Digital identity	On-line processing SSB/MIS
Treatment A* Female	0.03	0.01	0.04	-0.02
	(0.03)	(0.04)	(0.05)	(0.07)
Treatment B * Female	-0.01	0.02	-0.02	-0.06
	(0.03)	(0.03)	(0.05)	(0.07)
Observation	968	1350	1338	1336
R2	0.02	0.06	0.02	0.01
Control Mean	5.22	0.63	0.49	0.72

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 18: Analysis of Heterogeneity – Age

	Digital skills	Computer task index	Internet use index	Interest learning
Treatment A * Age	0.03	0.02	0.05	0.04
	(0.22)	(0.02)	(0.04)	(0.04)
Treatment B * Age	-0.17	0.03	0.01	0.07**
	(0.22)	(0.03)	(0.04)	(0.04)
Observation	972	1360	1348	1346
R2	0.03	0.13	0.04	0.01
Control Mean	5.22	0.64	0.49	0.72

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 19: Analysis of Heterogeneity - Age

	Online public admin.	Advantages online public	Digital identity	On-line processing SSB/MIS
Treatment A * Age	0.05*	0.06**	0.08*	0.15**
	(0.03)	(0.03)	(0.04)	(0.07)
Treatment B * Age	0.03	0.03	-0.01	0.04
	(0.03)	(0.03)	(0.04)	(0.07)
Observation	1361	1355	1359	1337
R2	0.05	0.01	0.12	0.02
Control Mean	0.38	0.91	0.38	0.53

Robust standard errors in parentheses
Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.

5 Conclusions of the evaluation

The aim of this report is to evaluate the impact of the project "CONECT-AS - digital social inclusion", which consists of an itinerary of accompaniment in digital skills and access to support and advice on demand aimed at beneficiaries of the MIS and/or the SSB, over 18 years of age, in the 78 councils of the Principality of Asturias.

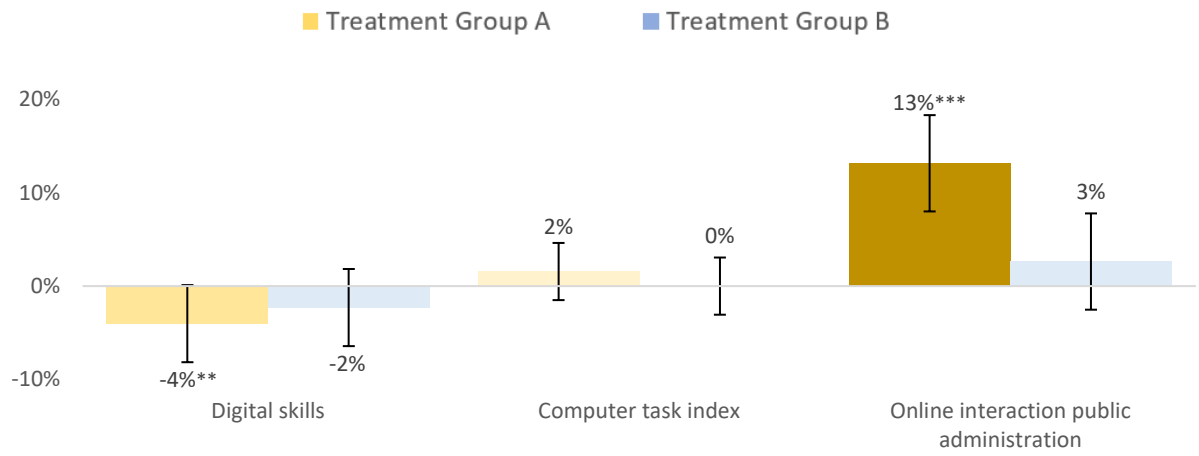
The results of the impact assessment show that the provision of compulsory training in digital skills improves interaction with the Public Administration by digital means, with a 13% increase in the number of online procedures and procedures with the Public Administrations. In addition, there is also

an increase in the number of online procedures to make changes to the SSB/MIS and the availability of digital identity.

However, there are no significant effects on digital skills or the use of digital media for daily activities, except for the 5.6% increase in interest in expanding digital knowledge for those participants who undertook the program.

As for Treatment Group B, which receives support and advice on demand, no significant differences were observed with respect to the Control Group in any of the dimensions considered.

Figure 9: Effect of the intervention on the leading indicators



Note: The results of the participants in Treatment Group A are highlighted in yellow. Significant effects are displayed in gold at 1% and in dark yellow for indicators significant at 5%. Yellow indicates significant results at 10%, while light yellow denotes results that are not significant at 10%. Results for participants in Treatment Group B are presented in blue. Indicators with treatment effects significant at 1% are shown in dark blue, effects significant at 5% are in blue, and indicators not significant at 10% are in light blue. The effects shown in the graphs correspond to regressions with controls and are expressed as a percentage relative to the mean of the Control Group.

Several potential limitations exist in this study. Firstly, the absence of a pure control group prevents a direct assessment of the impact of the €1,000 voucher, which likely constituted a pivotal aspect of the intervention. Secondly, all outcome variables, excluding the test results, rely on self-reported data, which heightens susceptibility to experimenter demand effects. Self-reported outcomes may potentially overestimate future changes in actual behavior. Third, we have some concerns about the design of the skills test and its capability to appropriately measure participants' digital skills. Finally, the external validity of the results obtained in this evaluation for other contexts is likely to depend crucially on the quality of the training provided, as well as the initial degree of digital literacy of participants.

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Appendix

Economic and regulatory management

1. Introduction

Within the framework of the National Recovery, Transformation, and Resilience Plan, the General Secretariat for Inclusion (SGI) of the Ministry of Inclusion, Social Security, and Migration is significantly involved in Component 23 "New public policies for a dynamic, resilient, and inclusive labor market", framed in policy area VIII "New care economy and employment policies".

Investment 7 "Promotion of Inclusive Growth by linking socio-labor inclusion policies to the Minimum Income Scheme" is one of the reforms and investments proposed in this Component 23. Investment 7 promotes the implementation of a new inclusion model based on the Minimum Income Scheme (MIS), which reduces income inequality and poverty rates. To achieve this objective, the development of pilot projects has been proposed, among others, for the implementation of social inclusion pathways with autonomous communities, local entities, and Third Sector of Social Action organizations, as well as with the different social agents.

Royal Decree 938/2021, of October 26, which regulates the direct granting of subsidies from the Ministry of Inclusion, Social Security, and Migrations in the field of social inclusion, for an amount of €109,787,404, within the framework of the Recovery, Transformation, and Resilience Plan[11], contributed to meeting milestone 350 for the first quarter of 2022 as outlined in the Council's Implementing Decision: "Improve the rate of access to the Minimum Income Scheme, and increase the effectiveness of the MIS through inclusion policies, which, according to its description, will translate into supporting the socio-economic inclusion of the beneficiaries of the MIS through itineraries: eight collaboration agreements signed with subnational public administrations, social partners and entities of the Third Sector of Social Action to conduct the pathways. The objectives of these partnership agreements are: (i) improve the MIS access rate; ii) increase the effectiveness of the MIS through inclusion policies". Likewise, along with Royal Decree 378/2022, of May 17[12], "at least 10 additional collaboration agreements signed with subnational public administrations, social partners and entities of the Third Sector of Social Action to implement pilot projects to support the socio-economic inclusion of the beneficiaries of MIS through itineraries" contributed to compliance with

[11]Royal Decree 938/2021, of October 26, regulating the direct granting of subsidies from the Ministry of Inclusion, Social Security, and Migrations in the field of social inclusion, for an amount of 109,787,404 euros, within the framework of the Recovery, Transformation, and Resilience Plan (BOE-A-2021-17464). It can be consulted at the following link: https://www.boe.es/diario_boe/txt.php?id=BOE-A-2021-17464.

[12] Royal Decree 378/2022, of May 17, 2022, regulating the direct granting of subsidies from the Ministry of Inclusion, Social Security and Migration in the field of social inclusion, for an amount of 102,036,066 euros, within the framework of the Recovery, Transformation and Resilience Plan (BOE-A-2022-8124). It can be consulted at the following link: https://www.boe.es/diario_boe/txt.php?id=BOE-A-2022-8124.

monitoring indicator number 351.1 in the first quarter of 2023, linked to the Operational Arrangements document[13].

Furthermore, following the execution and evaluation of each of the subsidized pilot projects, an assessment will be conducted to evaluate the coverage, effectiveness, and success of the minimum income schemes. The publication of this evaluation, which will include specific recommendations to improve the access rate to the benefit and enhance the effectiveness of social inclusion policies, contributes to the achievement of milestone 351 of the Recovery, Transformation, and Resilience Plan scheduled for the first quarter of 2024.

In accordance with Article 3 of Royal Decree 938/2021, dated October 26, subsidies will be granted through a resolution accompanied by an agreement of the head of the Ministry of Inclusion, Social Security and Migration as the competent authority for granting them, without prejudice to the existing delegations of competence in the matter, upon request by the beneficiary organizations.

On **December 13, 2021**, the Principality of Asturias was notified of the Resolution of the General Secretariat for Inclusion and Social Welfare Objectives and Policies granting a subsidy in the amount of 7,335,893.09 euros to the Principality of Asturias and, on **December 16, 2021**, an Agreement is signed between the General State Administration, through the General Secretariat for Inclusion and Social Welfare Objectives and Policies and the Principality of Asturias for the implementation of a social inclusion project within the framework of the Recovery, Transformation, and Resilience Plan, which was published in the "*Boletín Oficial del Estado*" on 1 February 2022 (BOE no. 27).[14]

2. Time frame of the intervention

Article 16(1) of Royal Decree 938/2021, dated October 26, established that the execution period for the pilot projects of social inclusion itineraries subject to the subsidies provided for in this text shall not exceed the deadline of June 30, 2023, while their evaluation shall not extend beyond March 31, 2024, to meet the milestones, set by the Recovery, Transformation, and Resilience Plan regarding social inclusion policies.

However, in accordance with section 2 of the first final provision of Royal Decree 378/2022, of May 17, Article 6(4) and Article 16(1) are redrafted to extend the maximum period of the pilot projects of social inclusion itineraries subject to subsidy until **October 31, 2023,** maintaining the deadline of **March 31, 2024,** for its evaluation.

[13] Decision of the European Commission approving the document 'Operational Provisions of the Recovery, Transformation, and Resilience Plan', which can be consulted at the following link: https://www.lamoncloa.gob.es/serviciosdeprensa/notasprensa/hacienda/Documents/2021/101121-CountersignedESFirstCopy.pdf.

[14] https://www.boe.es/diario_boe/txt.php?id=BOE-A-2022-1636

On **February 6, 2023,** the Principality of Asturias requested an extension of the execution period until **October 31, 2023**, authorizing it by resolution of the **General Secretariat for Inclusion and Social Welfare Objectives and Policies** (SGOPIPS) dated **March 10, 2023.**

Within this general timeframe, the implementation begins on **May 8, 2023**, with the start of the intervention itinerary, continuing the execution tasks until **October 31, 2023**, and then developing only dissemination and evaluation tasks of the project until **March 31, 2024**.

3. Relevant Agents

Among the relevant agents in the implementation of the project can be mentioned:

- **Principality of Asturias**, as the beneficiary entity and coordinator of the project.
- The public company TECNOLOGÍAS Y SERVICIOS AGRARIOS S.A., S.M.E., M.P. (**Tragsatec**) by order for the execution of the pilot.
- The **Ministry of Inclusion, Social Security and Migration (MISSM)** as the sponsor of the project, and as the main responsible for the RCT evaluation process. The General Secretariat for Inclusion (SGI) assumes the following commitments:
    a) Assist the beneficiary entity in the design of the activities to be carried out for the implementation and monitoring of the object of the grant, as well as for the profiling of the potential participants of the pilot project.
    b) Design the randomized controlled trial (RCT) methodology of the pilot project in coordination with the beneficiary entity.
    c) Evaluate the pilot project in coordination with the beneficiary entity.
- **CEMFI and J-PAL Europe,** as scientific and academic institutions that support MISSM in the design and RCT evaluation of the project.

Attrition– Additional Analyses

Table 20: Selective Attrition: Treatment A vs. Control Group

	(1)		*(2)*		*(2)-(1)*	
	C		**TA**		**Pairwise t-test**	
Variable	**N**	**Mean/(SD)**	**N**	**Mean/ (SD)**	**N**	**P-value**
Female	466	0.69 (0.02)	456	0.70 (0.02)	922	0.72
Age	470	46.31 (0.53)	459	46.10 (0.53)	929	0.77
Urban area	470	0.73 (0.02)	460	0.73 (0.02)	930	0.87
Education	468	11.17 (0.15)	458	11.33 (0.15)	926	0.44
Household Size	460	2.21 (0.06)	444	2.23 (0.06)	904	0.81
Number of children	460	0.73 (0.04)	443	0.68 (0.04)	903	0.43
MIS Beneficiary	470	0.52 (0.02)	460	0.53 (0.02)	930	0.78
SSB Beneficiary	470	0.68 (0.02)	460	0.65 (0.02)	930	0.29
Computer	461	0.31 (0.02)	456	0.36 (0.02)	917	0.08*
Tablet	457	0.23 (0.02)	450	0.22 (0.02)	907	0.91
Mobile phone	470	1.00 (0.00)	459	1.00 (0.00)	929	0.99
Internet connection	469	0.92 (0.01)	455	0.92 (0.01)	924	0.99
Fixed Internet connection	469	0.66 (0.02)	455	0.63 (0.02)	924	0.30
Mobile Internet connection	469	0.32 (0.02)	455	0.37 (0.02)	924	0.17
Computer use	456	0.50 (0.02)	446	0.51 (0.02)	902	0.89
Use of tablet	452	0.25 (0.02)	442	0.24 (0.02)	894	0.66
Computer skills	466	0.66	456	0.67	922	0.70

		(1)		*(2)*		*(2)-(1)*
		C		**TA**		**Pairwise t-test**
Variable	**N**	**Mean/(SD)**	**N**	**Mean/ (SD)**	**N**	**P-value**
		(0.02)		(0.02)		
Tablet skills	456	0.66	455	0.65	911	0.65
		(0.02)		(0.02)		
Mobile skills	466	0.89	459	0.90	925	0.52
		(0.01)		(0.01)		
Internet use index	468	0.48	453	0.48	921	0.88
		(0.01)		(0.01)		
Advantages online public	470	0.91	458	0.92	928	0.43
admin.		(0.01)		(0.01)		
Interest learning	470	0.79	457	0.77	927	0.38
		(0.01)		(0.01)		
Task index	470	0.59	460	0.60	930	0.46
		(0.01)		(0.01)		
Online interaction public	470	0.38	460	0.39	930	0.53
admin.		(0.01)		(0.01)		
Digital identity	469	0.33	458	0.32	927	0.59
		(0.01)		(0.02)		
Online interactions MIS	469	0.40	453	0.40	922	0.93
		(0.02)		(0.02)		

Note: This table compares baseline characteristics for the subsample of individuals assigned to treatment A and individuals assigned to the control group who participated in the final questionnaire. The last column provides the p-value of an equality of means test for the corresponding variable. refers to a significance level of 1%, ** to 5% and * to 10%. Robust standard errors in parentheses.

Table 21: Selective Attrition: Treatment B vs. Control Group

	(1)		*(2)*		*(2)-(1)*	
	GC		**TB**		**Pairwise t-test**	
Variable	**Note.**	**Media/ (SE)**	**Note.**	**Media/ (SE)**	**Note.**	**P-value**
Female	466	0.69	461	0.69	927	0.91
		(0.02)		(0.02)		
Age	470	46.31	464	46.80	934	0.50
		(0.53)		(0.49)		
Urban area	470	0.73	464	0.75	934	0.49
		(0.02)		(0.02)		
Education	468	11.17	460	11.11	928	0.79
		(0.15)		(0.15)		
Household Size	460	2.21	449	2.26	909	0.53
		(0.06)		(0.06)		
Number children	460	0.73	448	0.67	908	0.35
		(0.04)		(0.04)		
MIS Beneficiary	470	0.52	464	0.50	934	0.44
		(0.02)		(0.02)		
SSB Beneficiary	470	0.68	464	0.68	934	0.88
		(0.02)		(0.02)		
Computer	461	0.31	453	0.35	914	0.17
		(0.02)		(0.02)		
Tablet	457	0.23	448	0.24	905	0.58
		(0.02)		(0.02)		
Mobile phone	470	1.00	463	1.00	933	0.99
		(0.00)		(0.00)		
Internet connection	469	0.92	462	0.95	931	0.10*
		(0.01)		(0.01)		
Fixed Internet connection	469	0.66	462	0.66	931	0.92
		(0.02)		(0.02)		
Mobile Internet connection	469	0.32	462	0.35	931	0.47
		(0.02)		(0.02)		
Computer use	456	0.50	449	0.51	905	0.92
		(0.02)		(0.02)		
Use of tablet	452	0.25	444	0.23	896	0.58
		(0.02)		(0.02)		
Computer skills	466	0.66	461	0.65	927	0.51
		(0.02)		(0.02)		

		(1)		*(2)*		*(2)-(1)*
		GC		**TB**		**Pairwise t-test**
Variable	**Note.**	**Media/ (SE)**	**Note.**	**Media/ (SE)**	**Note.**	**P-value**
Tablet skills	456	0.66 (0.02)	452	0.63 (0.02)	908	0.30
Mobile skills	466	0.89 (0.01)	461	0.89 (0.01)	927	0.94
Internet use index	468	0.48 (0.01)	457	0.50 (0.01)	925	0.25
Advantages online public admin.	470	0.91 (0.01)	463	0.91 (0.01)	933	0.83
Interest learning	470	0.79 (0.01)	462	0.80 (0.01)	932	0.36
Task index	470	0.59 (0.01)	464	0.59 (0.01)	934	0.62
Online interaction public admin.	470	0.38 (0.01)	464	0.38 (0.01)	934	0.96
Digital identity	469	0.33 (0.01)	463	0.31 (0.01)	932	0.21
Online interactions MIS	469	0.40 (0.02)	460	0.38 (0.02)	929	0.71

Note: This table compares baseline characteristics for the subsample of individuals assigned to treatment B and individuals assigned to the control group who participated in the final questionnaire. The last column provides the p-value of an equality of means test for the corresponding variable. refers to a significance level of 1%, ** to 5% and * to 10%. Robust standard errors in parentheses