

Qualification: assessment of Digital Competencies Using the DIGCOMP Framework in the Business Context

Evaluación de competencias digitales utilizando el marco de referencia DIGCOMP en el contexto empresarial

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How to cite?

Laguado, O.E., Vera, F.H., Rodríguez, R.E. Qualification: assessment of Digital Competencies Using the DIGCOMP Framework in the Business Context Ingeniería y Competitividad, 2025, 27(1) e-20614252

<https://doi.org/10.25100/iyv.v27i1.14252>

Recibido: 12-06-24

Evaluado: 20-08-24

Aceptado: 15-10-24

Online: 19-02-25

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Abstract

Introduction: This project evaluates digital competencies in the business sector, focusing on the employees in managerial positions at the company Inmobiliaria Viviendas y Valores S.A. in Cúcuta, Colombia. The approach of this study is based on evaluating these competencies using the internationally recognized DIGCOMP framework, adapted to the specific needs of the company.

Objective: The main objective of this project is to determine the level of digital competence of the managerial employees at Inmobiliaria Viviendas y Valores S.A. using the European Union's DIGCOMP framework, tailored to the company's specific training program.

Methodology: The methodology employed in this study follows a quantitative approach. A questionnaire based on the DIGCOMP Portal and the Ikanos Test was used to assess the digital competencies of the managerial employees. The data collection provided information on various digital competencies, which were analyzed to identify strengths and areas for improvement in the use of digital tools and problem-solving, among others.

Results: The results show that the managerial employees have strengths in using digital tools and resolving technology-related problems. However, areas for improvement were identified in aspects such as online security and digital creativity. Additionally, the high standard deviation in some competencies suggests that the impact of the training course varied among participants. Some employees showed significant improvements, while others experienced more modest advances.

Conclusions: The conclusions of the study emphasize the importance of evaluating digital competencies within organizations to identify training and professional development needs. This process not only helps improve individual skills but also drives the company's digital transformation, contributing to improved efficiency and competitiveness in the market. Ongoing evaluation of these competencies is crucial for making informed decisions about the design of training programs and ensuring that the organization can successfully adapt to the digital challenges of the business environment.

Keywords: Digital competence, Digital transformation, Digital platform, technological education.

Resumen

Introducción: Este proyecto evalúa las competencias digitales en el ámbito empresarial, centrándose en los empleados de cargos directivos de la empresa Inmobiliaria Viviendas y Valores S.A. en Cúcuta, Colombia. El enfoque de este estudio se basa en la evaluación de estas competencias utilizando un marco de referencia reconocido internacionalmente, el DIGCOMP, adaptado a las necesidades específicas de la empresa.

Objetivo: El objetivo principal de este proyecto es determinar el nivel de competencia digital de los empleados directivos de la empresa Inmobiliaria Viviendas y Valores S.A. utilizando el marco de referencia DIGCOMP de la Unión Europea, adaptado al programa formativo específico de la empresa.

Metodología: La metodología empleada en este estudio sigue un enfoque cuantitativo. Se utilizó un cuestionario basado en el Portal DIGCOMP y el Test Ikanos para evaluar las competencias digitales de los empleados directivos. La recolección de datos permitió obtener información sobre diversas competencias digitales, que fueron analizadas para determinar las fortalezas y áreas de mejora en el uso de herramientas digitales y la resolución de problemas, entre otras.

Resultados: Los resultados muestran que los empleados directivos poseen fortalezas en el uso de herramientas digitales y en la resolución de problemas relacionados con la tecnología. Sin embargo, se identificaron áreas de mejora en aspectos como la seguridad en línea y la creatividad digital. Además, la desviación estándar alta en algunas competencias sugiere que el impacto del curso formativo varió entre los participantes. Algunos empleados mostraron mejoras significativas, mientras que otros experimentaron avances más limitados.

Conclusiones: Las conclusiones del estudio resaltan la importancia de evaluar las competencias digitales dentro de las organizaciones para identificar necesidades de formación y desarrollo profesional. Este proceso no solo permite mejorar las habilidades individuales, sino que también impulsa la transformación digital de la empresa, contribuyendo a la mejora de la eficiencia y competitividad en el mercado. La evaluación continua de estas competencias es crucial para tomar decisiones informadas sobre el diseño de programas formativos y para garantizar que la organización pueda adaptarse con éxito a los desafíos digitales del entorno empresarial.

Palabras clave: Competencia digital, Transformación digital, Plataforma digital, educación tecnológica.



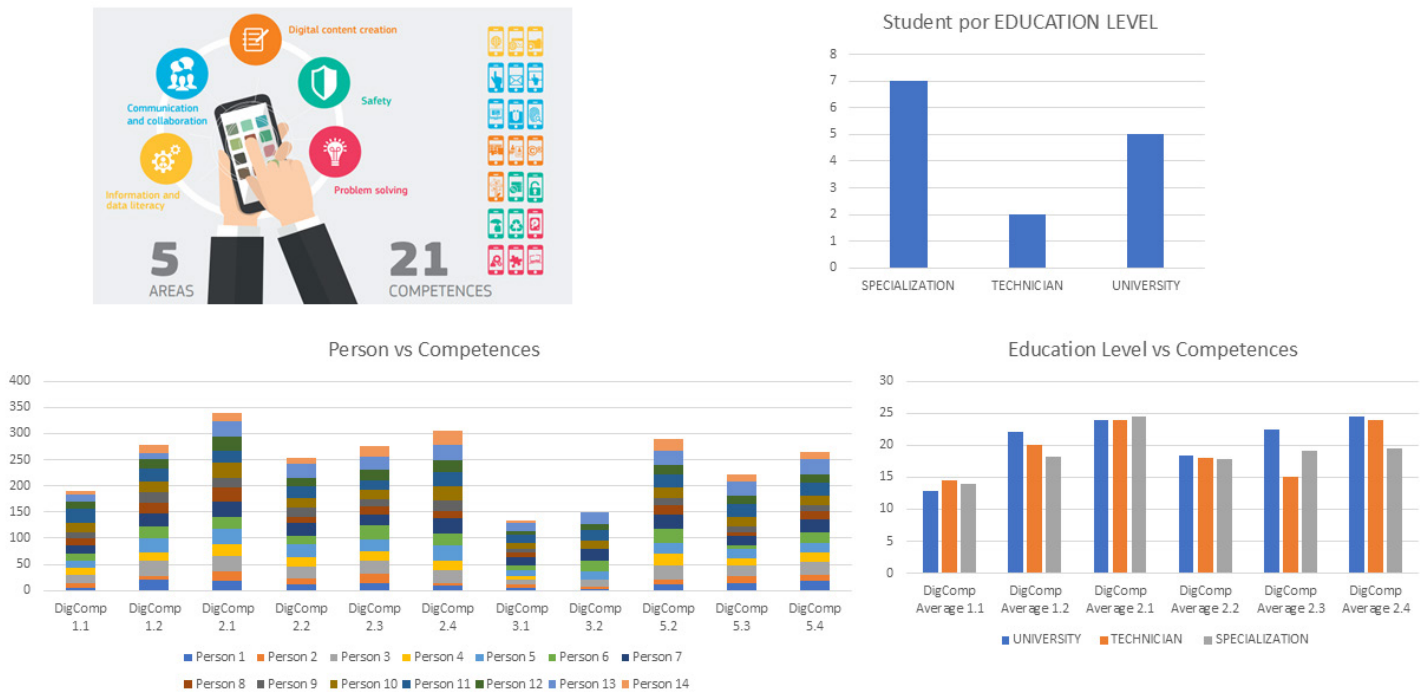
Contribution to the literature

Why was it conducted?
The study was conducted to assess the digital competencies of company executives, particularly focusing on their ability to utilize generative artificial intelligence tools for improving office tasks.

What were the most relevant results?
The most relevant results showed that 70% of executives demonstrated strong skills in data evaluation, while areas like digital collaboration and content creation were identified as needing improvement, with 60% and 80% of participants performing below expectations, respectively.

What do these results contribute?
These results highlight key strengths and areas for improvement in the executives’ digital competencies, providing a clear roadmap for targeted training and development, which could enhance overall productivity and digital transformation within the company.

Graphical Abstract



Introduction

This study evaluates digital competencies in the business context, focusing on the executive employees of the real estate company Viviendas y Valores S.A. in Cúcuta, Colombia. The use of the European Union's DIGCOMP framework provides a comprehensive approach to measure key competencies necessary for the company's digital transformation. This framework is widely recognized for its ability to assess digital skills, enabling the identification of critical improvement areas and the design of targeted training strategies to optimize managerial performance. In recent years, the integration of technology into various aspects of business operations has become increasingly common. Therefore, understanding and evaluating digital competencies among employees, particularly those in leadership roles, has gained significant attention in both academic and practical spheres.

According [\(1\)](#), digital literacy can be understood as the result of the process of developing digital competencies. These competencies include a broad set of skills related to technology management, information processing and digital security, which must be acquired and developed to achieve an adequate level of literacy in digital environments. Therefore, digital competence is conceptualized as the process by which people acquire and improve their skills in the critical and responsible use of Information and Communication Technologies (ICT), recognizing that its development is fundamental to achieving digital literacy as an ultimate goal. In this context [\(2\)](#), emphasize that digital empowerment in the business environment and in relation to the management of public policies implies providing options based on the use of collaborative techniques, strategies, and methodologies in order to optimize processes and communication channels, without being limited by space and time constraints. In addition, the use of technologies facilitates access to information, which has a significant impact on the basis for the construction of knowledge.

Several studies have explored the assessment of digital competencies in different contexts in Colombia. [\(3\)](#) developed a reliable and accurate instrument, the Digital Competency Rating Scale (DCRS), to assess these competencies in high school students. [\(4\)](#) applied the DIGCOMP model to create a self-assessment tool for university students, while [\(5\)](#), conducted a study on the key digital competencies that SENA should develop by 2025 to improve the level of employability of people with disabilities in the city of Bogotá, and divides the results into three parts: competencies in the area of e-commerce, competencies in the area of artificial intelligence, and competencies in the area of artificial intelligence and work in the cloud and the key actors in the development of training processes in digital competencies, as a result allows to focus and identify the key digital competencies that the productive sector will demand in the short, medium and long term, allowing in advance to design or redesign training programs to respond with relevance to the needs of the productive sectors.

Digital competence is not limited to a static and unidimensional concept, but involves the interaction of multiple variables [\(6\)](#). Being digitally competent implies the ability to perform various technology-related activities in a critical and relevant manner. The development of digital competencies requires strategies that foster the appropriation of knowledge with the use of ICTs, designed to allow students to be active protagonists of their own learning process [\(7\)](#).

The theoretical framework guiding this research is based on the DIGCOMP framework established by the European Union. This framework provides a comprehensive structure for assessing digital competencies in various domains, aligning with contemporary theories on digital literacy and skills development. The main contribution of this article lies in demonstrating how a well-structured course on artificial intelligence tools can significantly improve students' digital competencies, providing a replicable model for other educational and corporate institutions. The importance of this study is reflected in its potential to influence the design of digital training programs, promoting the effective use of artificial intelligence in the work environment. The impacts of these findings are broad, as they can guide future educational initiatives and improve the competitiveness of students in the labor market. In addition, the results benefit companies by having employees better prepared to face technological challenges and optimize their internal processes.

This study builds on previous research in the field, with the aim of providing new insights into the digital competence of managers in a specific organizational context. Section 2 details the methodology used in the study, describing the data collection methods, the instruments used and the variables analyzed. Section 3 presents the results obtained, with a detailed analysis of the digital competencies assessed and the areas for improvement identified. Finally, in section 4, the conclusions and recommendations derived from the findings are discussed, including suggestions for future research and improvement strategies in digital competencies.

Methodology

Quantitative methods will be used to collect numerical data on employees' digital competencies. This includes structured questionnaires based on the European Union's DIGCOMP framework, as well as the use of standardized tests such as the Ikanos Digital Competency Test. These quantitative methods allow objective information to be obtained on the level of digital competence of participants, identifying areas of strength and opportunities for improvement in a quantifiable way. Evaluation research through the expert competence coefficient highlights the DigCompEdu model as the most appropriate for assessing Digital Competence [\(8\)](#).

Positivist Paradigm and Quantitative Approach: The positivist paradigm, developed by Auguste Comte, is based on the belief that authentic knowledge must come from empirical observation and the use of the scientific method. This paradigm holds that social and natural phenomena can be studied objectively, through measurement and quantitative data analysis. The quantitative approach, aligned with the positivist paradigm, involves the use of numerical data and statistical methods for the collection and analysis of information. This approach seeks to establish relationships between variables and make inferences based on measurable data, allowing the generalization of results through representative samples.

Method and Instruments: In the context of the study on digital competencies using the DIGCOMP framework, the method applied was quantitative in nature using a customized questionnaire based on the DIGCOMP Portal and the Ikanos Test, a tool developed to provide an approximation of the digital profile of citizens in general, with the use of structured questionnaires as the main instrument for data collection. The questionnaire was selected as the main data collection instrument due to its ability to provide an accurate and structured assessment of

participants’ digital competencies. The questionnaire was chosen to assess the digital competencies of employees in managerial positions, using the competencies and sub-competencies established by the DIGCOMP framework as a guide. This questionnaire, although initially designed for citizens, was adapted to the needs of Viviendas y Valores S.A. managerial employees to measure their digital competencies in a business environment. This adaptation was validated through pilot testing to ensure that the questions adequately reflected sector-specific digital competencies.

The questionnaire included questions related to the five areas of digital competence according to DIGCOMP: Information and Data Literacy, Communication and Collaboration, Digital Content Creation, Security, and Problem Solving. Responses were coded in a way that allowed statistical analysis and comparison of results.

Variables and Hypotheses: For this study, the variables of interest were the following: Dependent variable, Level of digital competence, measured through the structured questionnaire. This variable was measured on a scale from 0 to 30, where the levels of competence were defined as follows: Beginner (0-5), Elementary (6-10), Intermediate (11-15), High Intermediate (16-20), Advanced (21-25), and Expert (26-30). Independent variables: Various factors that could influence the level of digital competence, such as age, educational level, work experience, frequency of use of digital technologies, among others. However, in this study, the focus was on the assessment of digital competencies without considering external factors. The general hypothesis of the study was: “Employees in managerial positions of the real estate company Viviendas y Valores SA present variations in their levels of digital competence, with areas of strength and weakness, according to the DIGCOMP framework”.

Table of Operationalization of Variables: To justify the questions in the questionnaire and the analysis of results, a table of operationalization of variables was developed. This table details how the key variables are measured, what indicators are used and the scale of measurement. Table 1.

Table 1. Definition of the Digital Competence Areas “DigComp”.

Variable	Dimension	Indicators	Instrument/ Measurement
Competition	Information and data literacy	Navigation, data search and filtering, data evaluation, storage and retrieval of information	Questionnaire/0-30
	Communication and collaboration	Interaction, sharing, citizen engagement, collaboration through digital technologies	Questionnaire /0-30
	Create digital content	Content development, integration and digital content reelaboration	Questionnaire /0-30
	Security	Device and data protection, privacy and online security	Questionnaire /0-30
	Troubleshooting	Identification of needs, creative use of digital technologies, identification of digital competency gaps	Questionnaire /0-30

Source: European Commission (2013)

Justification of the Questionnaire Questions: The questionnaire was chosen to assess the different competencies according to the DIGCOMP framework, based on the context of the company Inmobiliaria Viviendas y Valores SA. Each question is related to one of the dimensions of the DIGCOMP framework, thus allowing to measure the level of competence in specific areas. The structure of the questionnaire, based on the quantitative approach and the positivist paradigm, provided objective data that were statistically analyzed to obtain solid conclusions

Participants: The sample is composed of employees in managerial positions (14 employees) of Inmobiliaria Viviendas y Valores SA in Cúcuta, Colombia. To complement the results of the survey on digital competencies and to obtain a more complete view of the profile of employees in a business context, several relevant data that may affect or be related to the level of digital competency can be considered. Here are some data that can be considered: Demographic information (Age: Can give an idea of whether there is correlation between digital skills and generations, Gender: Can be useful to assess equity and diversity in digital skills, Educational level: Often, people with more education have more exposure to digital technologies). Job information (Job title/position: Employees in managerial roles may have different levels of digital competency compared to more technical or administrative roles, Seniority in the company: More experienced employees may have different skills compared to new employees).

Procedure: Participants completed the questionnaire voluntarily and confidentially, providing information about their level of competence in the different areas assessed. Subsequently, the data collected was analyzed to identify patterns and trends in relation to the digital competencies of managers. The questionnaire was conducted online through the following online platform, URL: https://www.beforget.com/qsm_quiz/test-digcomp-v1-inicio/.

Result

Analysis of Results: Definition of the population, considering that the unit of analysis corresponds to employees with managerial positions, 14 surveys were conducted, the results of which for each of the areas are as follows (table 2)

Table 2. Employee Information

Student	AGE	GENDER	EDUCATION LEVEL
Person 1	51	Female	Specialization
Person 2	51	Female	Specialization
Person 3	33	Male	University
Person 4	49	Male	University
Person 5	38	Male	University
Person 6	39	Female	University
Person 7	46	Female	Specialization
Person 8	55	Male	Specialization
Person 9	54	Male	Technician
Person 10	30	Male	Technician
Person 11	33	Female	Specialization
Person 12	53	Female	Specialization
Person 13	36	Male	Specialization
Person 14	35	Male	University

Analysis by competencies: Considering the competencies related to Area 1, corresponding to information and data literacy and whose competencies are a) Navigating, searching, and filtering

information, b) Evaluating information and c) Storing and retrieving information, in the digital competency DigComp 1. 1 (Navigating, Searching and Filtering Data): It is observed (Figure 1) a diversity in the competency levels, having the majority in the Beginner, Elementary and Intermediate levels, there is a need to reinforce the skills of navigation, searching and filtering data in the elementary and beginner levels, considering that these levels correspond to 60% of the respondents and that they are in a score below 16.

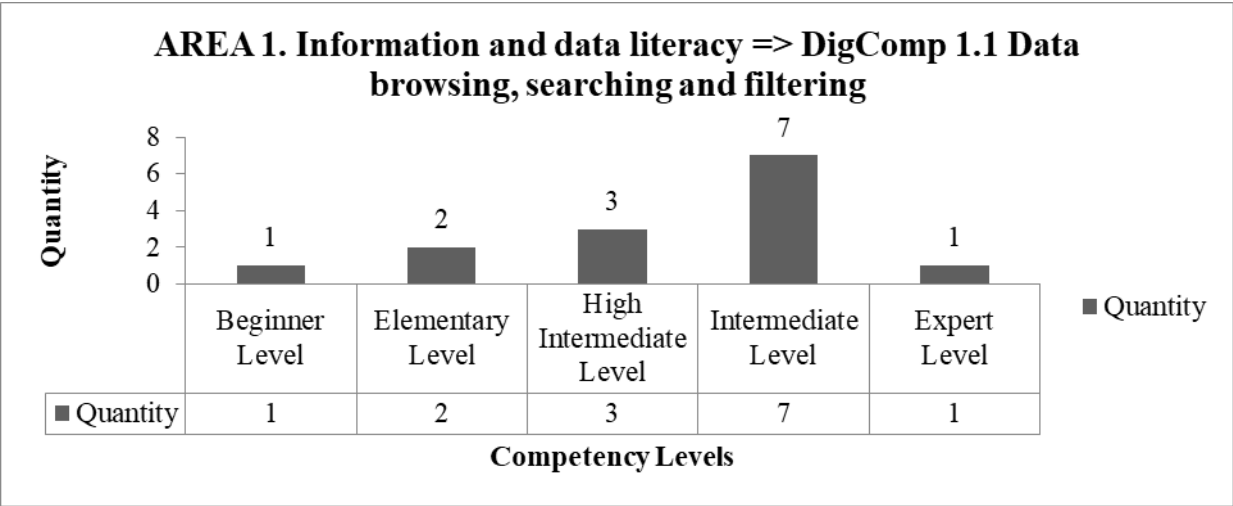


Figure 1. Results Area 1. Information and Data Literacy => DigComp 1.1. Navigation, search and filtering of data.

For the competency, DigComp 1.2 (Evaluate Data, Information and Digital Content): In figure (Figure 2), it is evident that there is a solid competency at high intermediate, advanced and expert levels with 70%, and an opportunity for improvement is identified at the elementary and intermediate levels with 30% of respondents giving a focus on developing data and digital content evaluation skills at these levels.

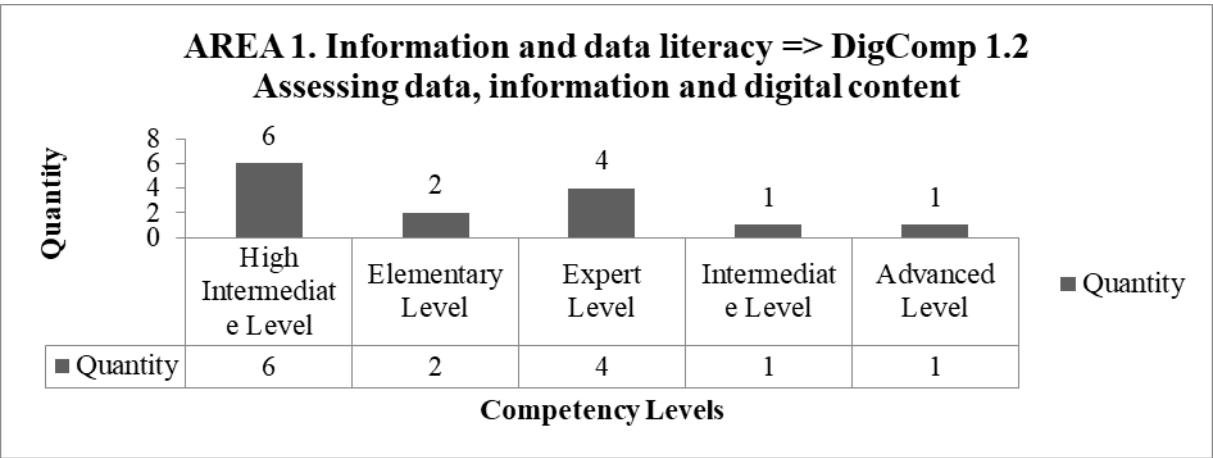


Figure 2. Results Area 1. Information and Data Literacy => DigComp 1.2 Evaluate data, information, and digital content



DigComp 2.1 (Interacting through Digital Technologies): As described in the following figure (Figure 3), an advanced competence in digital interaction is highlighted finding everyone above the average score, with the majority at the expert level at 50%, with the above it is considered important to continue promoting the effective use of digital tools for communication, to improve in this competence in a general way of the participants.

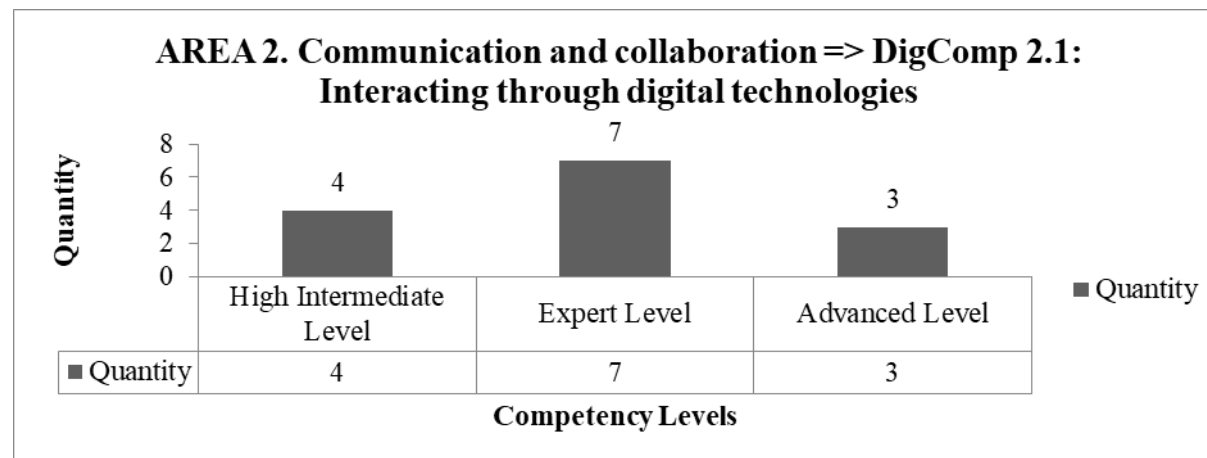


Figure 3. Results AREA 2. Communication and collaboration => DigComp 2.1: Interacting through digital technologies

DigComp 2.2 (Sharing through Digital Technologies): Although there is a varied but strong ability to share information and collaborate digitally (Figure 4), collaboration skills need to be strengthened at elementary and intermediate levels, having 4 participants below the overall average with scores below 16 and none at the Expert level.

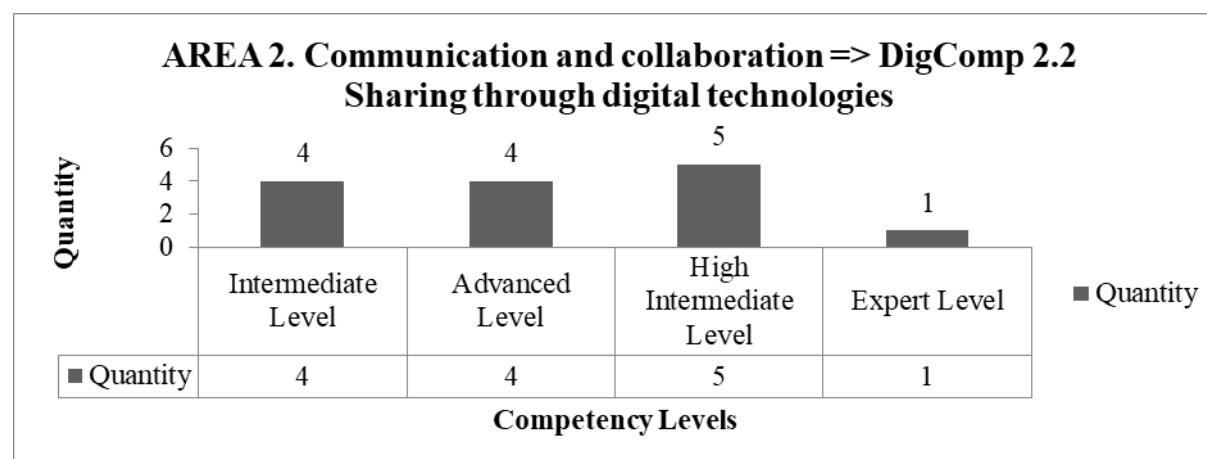


Figure 4. Results AREA 2. Communication and collaboration => DigComp 2.2 Sharing using digital technologies

DigComp 2.3 (Citizen Engagement with Digital Technologies): The following figure (Figure 5) shows a relatively high level of digital citizen engagement, but identifies opportunities for improvement at the beginner, elementary and intermediate levels, to generate greater participation and digital engagement at all levels, highlighting that there is 45% at the expert level.

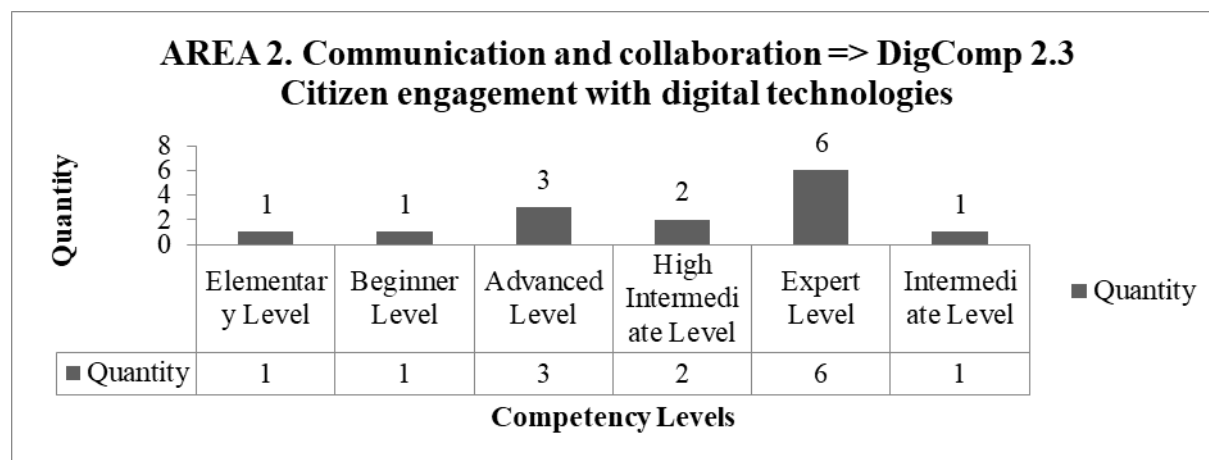


Figure 5. Results AREA 2. Communication and collaboration => DigComp 2.3 Citizen engagement with digital technologies

DigComp 2.4 (Collaborate Through Digital Technologies): According to the figure (Figure 6), an opportunity for improvement in digital collaboration skills is identified, in general, especially at the beginner to intermediate levels, with the need to provide specific training to improve these competencies.

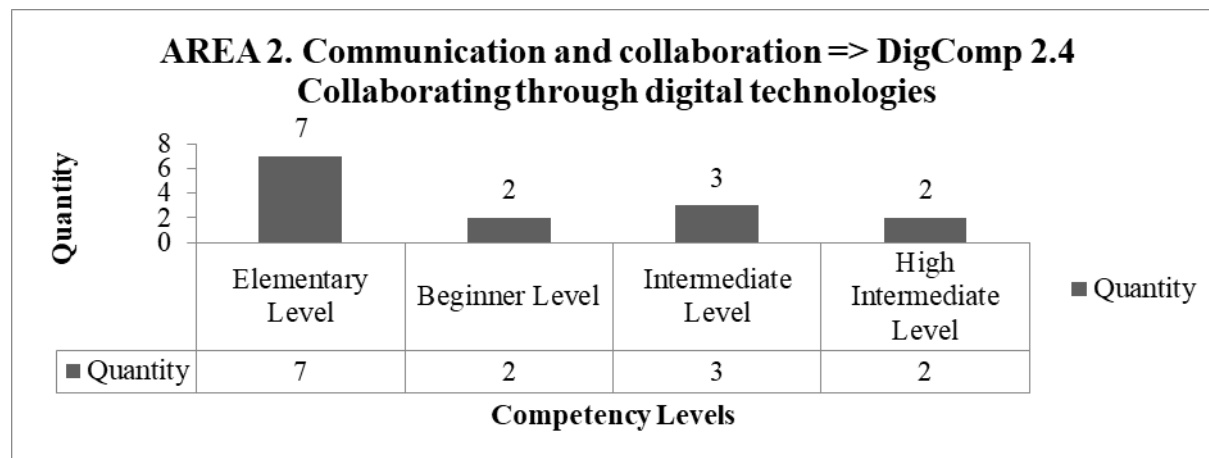


Figure 6. Results AREA 2. Communication and collaboration => DigComp 2.4 Collaborating through digital technologies

DigComp 3.1 (Content Development): In Figure 7, a need for improvement is identified, resulting in 80% of participants below the overall average with scores below 16. These skills need to be strengthened

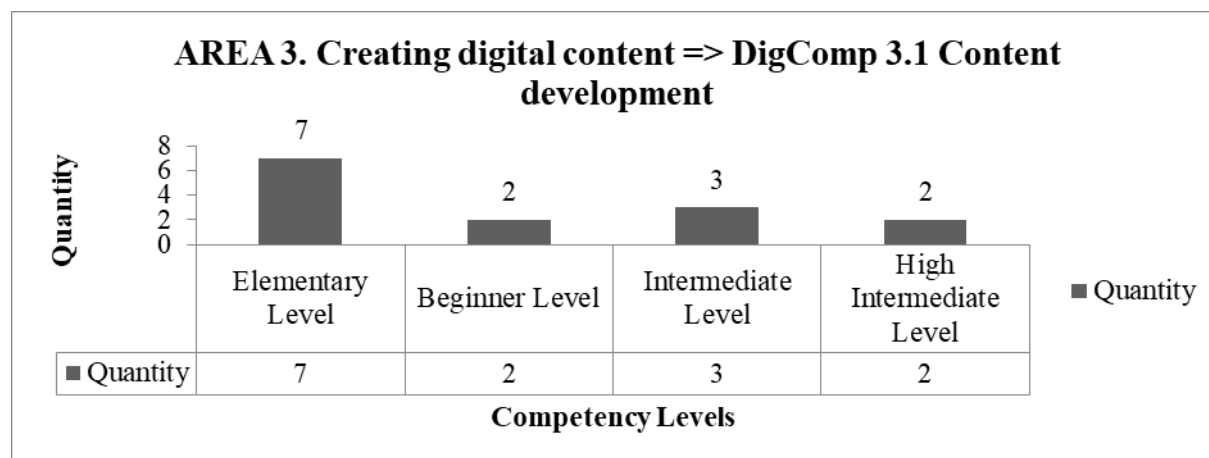


Figure 7. Results AREA 3. Creating digital content => DigComp 3.1 Content Development

DigComp 3.2 (Integrate and Re-elaborate Digital Content): Figure 8 shows an opportunity to strengthen the skills of integration and re-elaboration of digital content at all levels, with 5 participants above the overall average with scores higher than 16. It is required to provide resources and specific training to improve these competencies.

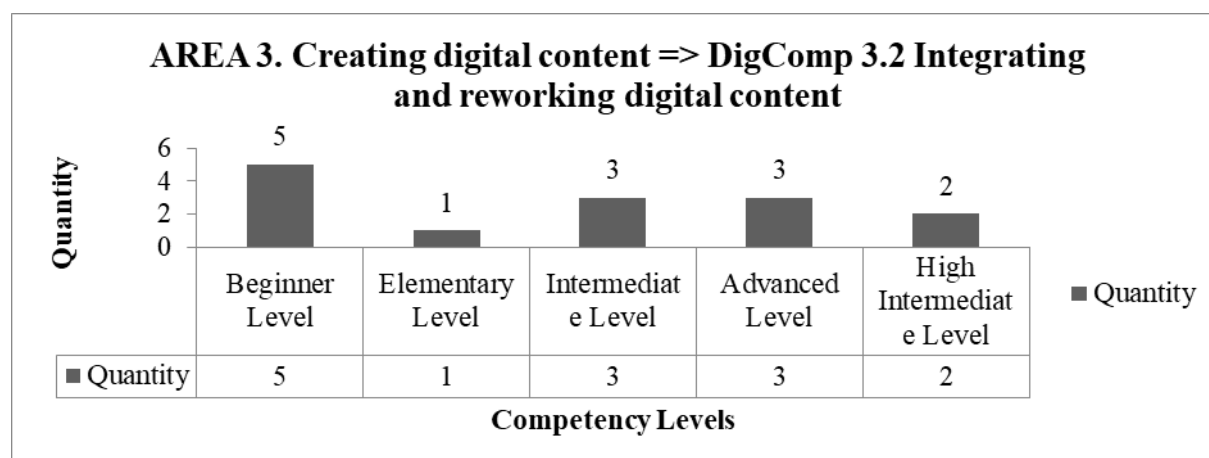


Figure 8. Results AREA 3. Create digital content => DigComp 3.2 Integrating and reworking digital content

DigComp 5.2 (Identify Technology Needs and Responses): (Figure 9). Although there is a strong capacity to identify technology needs and responses, opportunities for improvement are identified at the elementary and intermediate levels. It is suggested that training programs be offered to strengthen these skills, with 5 participants currently at the Expert level.

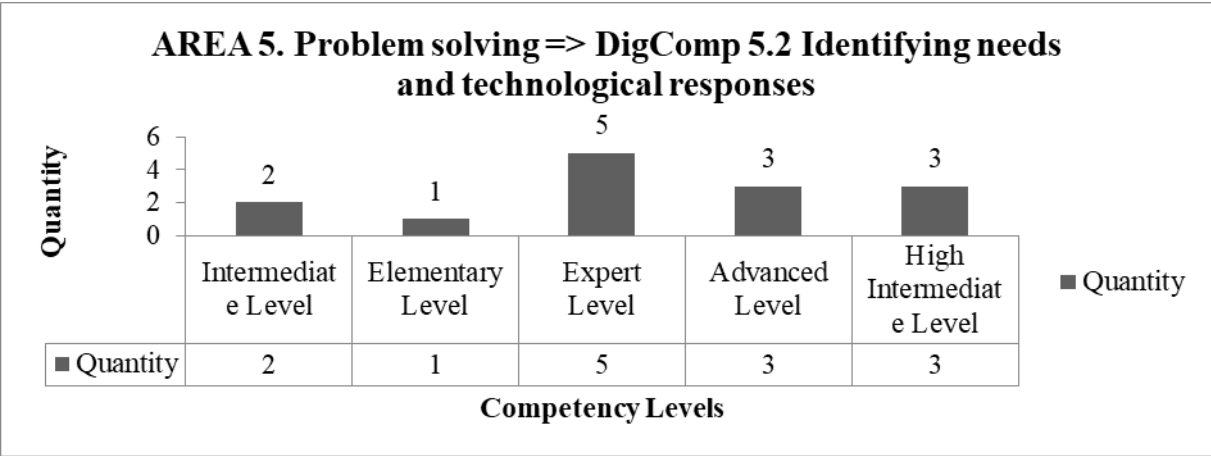


Figure 9. Results AREA 5. Problem solving => DigComp 5.2 Identify technology needs and answers

DigComp 5.3 (Creative Use of Digital Technology): (Figure 10) There is a promising capacity in the creative use of digital technology, but room for improvement is identified at all levels, with 50% below the overall average. It is important to encourage creativity and innovation in the use of digital tools.

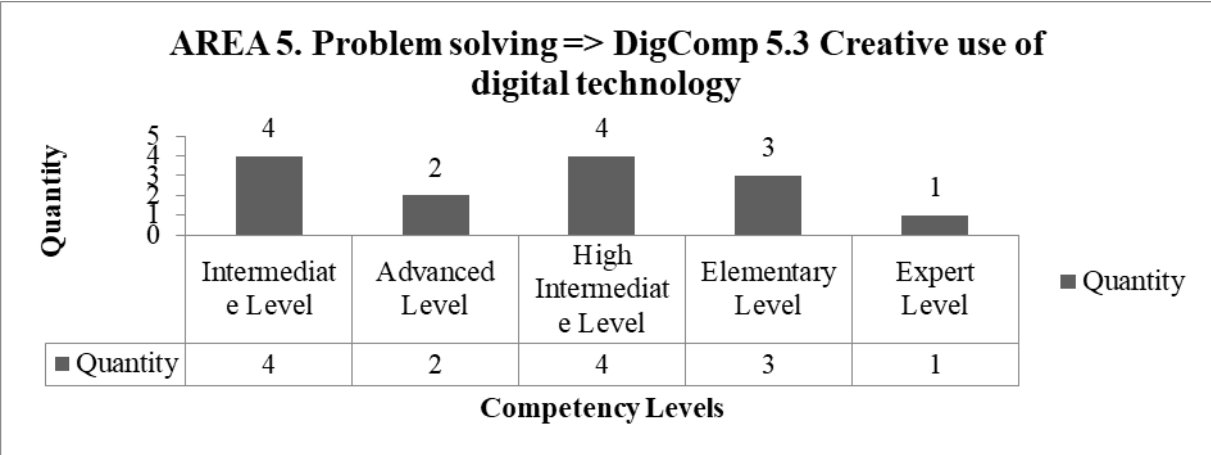


Figure 10. Results AREA 5. Problem solving => DigComp 5.3 Creative use of digital technology

DigComp 5.4 (Identify Gaps in Digital Competency): In Figure 11, an ability to identify gaps in digital competency is highlighted, especially at the high intermediate and expert levels. It is critical to continue to assess and improve digital competence throughout the organization.

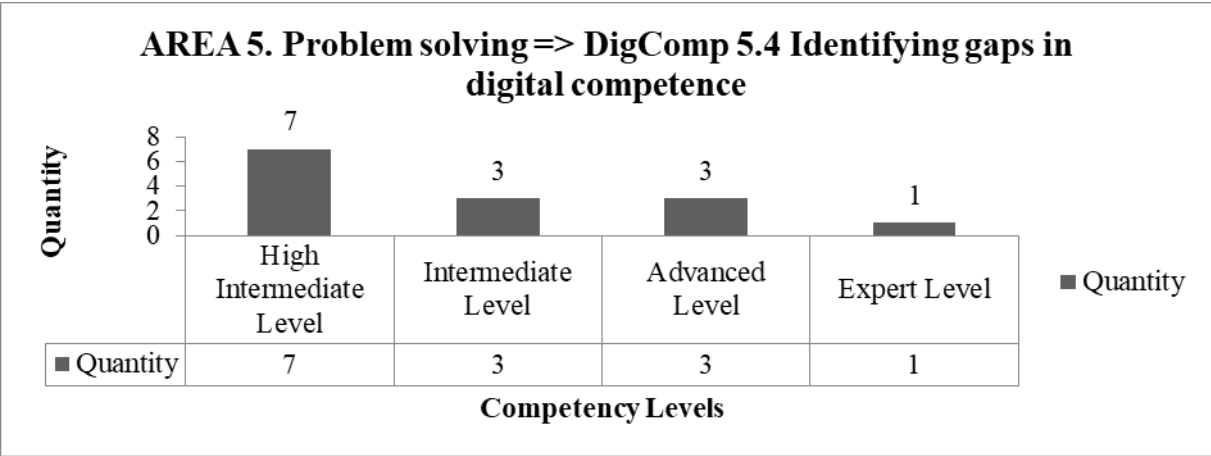


Figure 11. Results of AREA 5. Problem solving => DigComp 5.4 Identifying gaps in digital competence

In summary (Table 3), the results reveal a variety of digital competencies among the management staff of Inmobiliaria Viviendas y Valores SA, with strengths in areas such as Information and Data Literacy and in the area of Communication and Collaboration, as well as areas for improvement in digital content creation and problem solving. These findings provide a solid basis for developing strategies for training and continuous improvement in digital competencies within the company.

In the analysis of the information taking into account the educational level, it is evident from Tables 4 and 5 that the University Level has a higher number of competencies (3) above level 20, and together with the information in Table 6, in which the university educational level corresponds to 36% of the population evaluated, supports and substantiates what is indicated in Table 3, regarding the competencies that need to be improved and those that are evidenced as strong points.

Table 3. General Results Table

Student	AREA 1. Information and Data Literacy						AREA 3. Creating digital content		AREA 5. Troubleshooting		
	AREA 2. Communication and collaboration										
Person 1	4	20	18	12	14	10	6	2	12	15	18
Person 2	9	8	18	12	18	4	6	6	10	13	12
Person 3	17	30	30	22	24	24	10	14	26	21	24
Person 4	14	14	22	18	20	18	5	0	22	13	18
Person 5	12	28	30	24	22	30	11	14	22	18	20
Person 6	14	22	22	17	26	22	11	22	26	7	20
Person 7	17	26	30	24	20	30	15	22	26	17	24
Person 8	14	20	26	12	18	14	8	0	20	8	16
Person 9	11	20	20	18	12	20	8	0	12	10	12
Person 10	18	20	28	18	18	28	10	16	20	18	18
Person 11	27	26	22	23	18	26	16	20	26	25	24
Person 12	12	18	28	16	22	22	8	12	18	16	16

Person 13	15	10	30	26	24	30	16	22	28	28	30
Person 14	7	16	16	11	20	28	4	0	22	12	12

Table 4. General Table Area 1 and Area 2 Results by Educational Level

Education Level	DigComp Average 1.1	DigComp Average 1.2	DigComp Average 2.1	DigComp Average 2.2	DigComp Average 2.3	DigComp Average 2.4
UNIVERSITY	12.8	22	24	18.4	22.4	24.4
TECHNICIAN	14.5	20	24	18	15	24
SPECIALIZATION	14	18.28571429	24.57142857	17.85714286	19.14285714	19.42857143
Grand Total	13.64285714	19.85714286	24.28571429	18.07142857	19.71428571	21.85714286

Table 5. General Table Area 3 and Area 5 of Results by Educational Level

Education Level	DigComp Average 3.1	DigComp Average 3.2	DigComp Average 5.2	DigComp Average 5.3	DigComp Average 5.4
UNIVERSITY	8.2	10	23.6	14.2	18.8
TECHNICIAN	9	8	16	14	15
SPECIALIZATION	10.71428571	12	20	17.42857143	20
Grand Total	9.571428571	10.71428571	20.71428571	15.78571429	18.85714286

Table 6. Number of people by level of education

EDUCATION LEVEL	NUMBER OF PERSON
SPECIALIZATION	7
TECHNICIAN	2
UNIVERSITY	5

This statistical analysis based on the DigComp test results provides a more quantitative view of the participants’ competencies in each area and level. The averages per area allow for an overall assessment of the group’s strengths and weaknesses, providing a more detailed perspective for future interventions and improvements.

Statistical Summary (Pre-Course): DigComp Competency 1.1: Mean: 13.64, Standard deviation: 5.50, Minimum: 4, Maximum: 27. DigComp Competency 1.2: Mean: 19.86, Standard deviation: 6.44, Minimum: 8, Maximum: 30. DigComp Competency 2.1: Mean: 24.29, Standard deviation: 5.14, Minimum: 16, Maximum: 30. Other Competencies: Means and standard deviations for other competencies range from 9.57 to 21.86 for means, and from 3.93 to 9.10 for standard deviations.

Statistical Summary (After Course): DigComp Competency 1.1: Mean: 17.14, Standard deviation: 4.45, Minimum: 10, Maximum: 27. DigComp Competency 1.2: Mean: 23.43, Standard deviation: 5.46, Minimum: 14, Maximum: 30. DigComp Competency 2.1: Mean: 26.71, Standard deviation:

3.73, Minimum: 20, Maximum: 30. Other Competencies: Means and standard deviations for other competencies range from 11.57 to 23.86 for means, and from 3.67 to 7.49 for standard deviations.

Difference Analysis (Differences Before and After the Course): DigComp 1.1 Competency: Mean: 3.50, Standard deviation: 4.69, Minimum: 0, Maximum: 15. DigComp 1.2 Competency: Mean: 3.57, Standard deviation: 5.72, Minimum: 0, Maximum: 16. DigComp 2.1 Competency: Mean: 2.43, Standard deviation: 4.97, Minimum: -2, Max: 14. Other Competencies: Improvement means range from 1.29 to 3.14, with standard deviations between 3.48 and 6.55.

Discussion of results

The results of this study show a significant improvement in the digital competencies of the executives of Inmobiliaria Viviendas y Valores SA in Cúcuta, Colombia, after the implementation of a specific course on artificial intelligence tools for the optimization of office tasks. Specifically, a notable increase was observed in the sub-competencies DigComp 1.1 (information and data literacy), DigComp 1.2 (communication and collaboration), and DigComp 2.1 (digital content creation).

The results of this study show a significant improvement in the digital competencies of Inmobiliaria Viviendas y Valores S.A. executives, which coincides with previous studies conducted in other business sectors. For example, studies such as [\(9\)](#), which evaluated digital competencies in high school students, and [\(5\)](#), which analyzed key digital competencies in SENA, show that adapting the DIGCOMP framework to business contexts can have a positive impact on employee training, especially in areas such as digital communication and collaboration. Moreover, the variability in results, observed in some competencies such as digital content creation, is consistent with the findings of [\(4\)](#), who noted that the success of training programs depends largely on the initial level of digital competence of the participants. These results reinforce the idea that continuous training is key to the development of digital competencies in business environments. However, this study is pioneering in its application of the DIGCOMP framework in the real estate sector, providing a novel perspective on how digital competencies can enhance business management in this context.

Description of Results: Improvement in Key Competencies: Digital competencies showed significant improvements, with an average increase of 3.50 points in DigComp 1.1 and 3.57 points in DigComp 1.2. This suggests that the course was effective in strengthening these fundamental areas.

Variability of Course Impact: A high standard deviation was detected in some competencies, indicating that the impact of the course varied among students. While some showed considerable improvements, others experienced more modest gains.

Areas without Significant Changes: In competencies such as DigComp 3.1 and 3.2, improvement was minor or non-existent, suggesting that these areas may require a different methodology or more attention in future courses.

Consistent Performance: Students with high scores prior to the course tended to maintain their high performance, while those with lower scores showed marked improvement.

Comparison with the Related Work: These findings are consistent with previous studies that underline the importance of developing digital competencies, highlighting how continuous training in emerging technologies is key to improving the digital skills needed in today's work and educational environments (1, 10, 11). The improvement in specific digital competencies supports the assertions of (12), who highlight digital empowerment through the use of collaborative methodologies and advanced techniques to optimize processes and communication in the business environment. The study by (9), who developed the Digital Competencies Assessment Scale (EVCD) for high school students, and the study by (5) on digital competencies in Bogota, both underline the importance of adapting training programs to meet the demands of the productive sector. This study confirms the effectiveness of such adaptation in a corporate context.

Implications and Future Lines of Research: The implications of these results are significant for both education and business. Improving digital competencies through a structured course on artificial intelligence suggests that such training can be an effective strategy for improving employees' digital skills (13, 14), especially in leadership roles (15). Future studies should include long-term follow-up and a larger sample to validate these findings and explore how improvements in digital skills impact job performance and organizational efficiency.

Conclusions

This study demonstrates that a specific course on artificial intelligence tools can significantly improve the digital competencies of the executives of Inmobiliaria Viviendas y Valores SA. The improvement observed in the DigComp 1.1, 1.2 and 2.1 sub competencies suggests that the course was effective in strengthening critical areas for professional performance.

CRedit authorship contribution statement

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Financing, Conflict of interest, Ethics Implications: does not declare.

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