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Implementing leadership skills in students through art

Inmaculada Berlanga-Fernández^a , M^a Helena Vales-Villamarín^b , Beatriz Mocchi^c  and Santa Palella-Stracuzzi^d 

^aVice-Rectorate for Transference, Universidad Internacional de la Rioja, Spain; ^b Department of Education, Universidad Internacional de la Rioja, Spain; ^c Department of Communication, Universidad de Málaga, Spain; ^dDepartment of Business, EAE Business School-Madrid, Spain

ABSTRACT

The research explores the perceptions of students at various educational stages and their teachers regarding the effectiveness of a disruptive didactic innovation to implement communication and leadership skills through an art-based experience. A teaching experiment applied to 30 students from different educational levels was chosen as methodology, with a convergent mixed methods design of exploratory and descriptive nature, including a final integration phase to compare the results between the methodological streams. Specifically, a discourse analysis and a Likert scale survey were used. The results demonstrate the positive impact of the didactic innovation on the development of specific skills in Secondary education, High school and university students. All students have successfully implemented leadership, critical thinking, learning, creativity, resilience, and problem-solving skills. The study concludes that an experiential communication with art serves as a powerful tool to promote cross-cutting skills in a diverse educational setting, and that the experience is positively valued by both students and their teachers.

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Social Development and Personality Development; Higher Education; Middle School Education; Research Methods in Education; Education - Social Sciences; Culture; Art & Visual Culture;

1. Introduction

The present research explores the perceptions of students at various educational stages and their teachers regarding the effectiveness of disruptive didactic innovation to implement communication and leadership skills through an art-based experience. Previous studies and expert recommendations suggest seeking creative solutions to address the lack of these skills (World Economic Forum, 2020). This article presents an educational classroom experiment (Cobb & Gravemeijer, 2014) using a tool that facilitates skill development through experiential communication via art. The objective is to evaluate and understand the impact of this activity on the development of specific skills among students at different educational levels, integrating quantitative and qualitative analysis through mixed methods.

Leadership is a broad concept that refers to an individual's capacity to influence, motivate and guide others toward achieving common goals. It involves decision-making, effective communication, inspiring others and fostering a collaborative work environment. Leadership is one of the most sought-after characteristics in 21st-century professionals across a wide variety of contexts (Crawford & Fink, 2020; Ho & Odom, 2015). Although there are different theories and approaches to leadership, it is generally accepted that successful leaders possess specific characteristics and skills such as integrity, critical thinking, communication skills, strategic vision and the capacity to make effective decisions. Other skills such as resilience, personal development and continuous learning are key to making young people more attractive for the workplace (World Economic Forum, 2020), and developing in them the ability to

CONTACT Inmaculada Berlanga-Fernández  inmaculada.berlanga@unir.net  Vice-Rectorate for Transference, Universidad Internacional de la Rioja, Avenida de la Paz 137, Logroño, La Rioja, Spain

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exercise their professional activity independently and safely (Aliyeva, 2023). These skills can be acquired not only through formal education, but also informal education and other creative teaching methods (Zhukova, 2022). It is essential to promote the development of a high-quality, well-structured educational system strategically oriented toward cultivating technical expertise and interpersonal competencies, thereby preparing students for successful job performance (Cahyono et al., 2023).

In the school setting, educational programmes such as the International Baccalaureate (IB) significantly contribute to the development of these skills, as recent studies have shown (Dickson et al., 2018; Özkeskin, 2024). The attributes of the International Baccalaureate (inquirers, knowledgeable, thinkers, good communicators, principled, open-minded, caring, risk-takers, balanced and reflective) can provide a solid foundation for the development of leadership skills by fostering essential qualities and skills for influencing and guiding others toward achieving common goals.

At the university level, educational practices have traditionally focused on imparting theoretical knowledge rather than fostering essential skills such as research, practical application, teamwork, and self-awareness, which are crucial for continued personal and professional growth (Binks, 1996). The tendency has been not to integrate the development of these skills into the university curriculum, but to foster them through community service or volunteer programs (Marks, 2015). However, in recent years there have been changes in some institutions, which have begun to place greater emphasis on teaching skills related to sustainable (Leal-Filho et al. 2020), transformational (Antonopoulou et al., 2021) and experiential (Bush et al., 2023) leadership to university students.

In this context, creating experiential programmes that integrate social, cognitive and emotional skills across all educational levels is crucial. Despite longstanding suggestions regarding the need to include both specific and generic competencies, such as communication, leadership, and problem-solving—essential for optimal work performance (Fallows & Steven, 2000), there is still a perceived disconnect between academic curricula and the actual demands of the workplace (Zhu, 2023). This situation opens up significant opportunities to enhance social impact and inclusion by motivating educational institutions to integrate relevant workplace skills into their programmes; favoring the appearance of authentic leaders who are self-aware and guided by a strong set of ethical values that drive their actions. In this way, it is possible to create a climate of trust to stimulate the personal development of subordinates and the achievement of the Sustainable Development Goals (SDGs).

1.1. Symbiosis between art, leadership and education

The present research adopts an interdisciplinary approach, ‘an increasingly valued standard in science policy around the world’ (Undurraga et al., 2023, p. 582). It is based on the intersection of education, art and skills development needed in the 21st century, focusing on the impact of art-based educational programmes on cognitive and socioemotional skills development in students across different educational levels, from compulsory secondary education to university.

Why art? Artistic elements offer the possibility of questioning, contemplating and dialoguing with reality. Recent studies (Gibson & Ewing, 2020; Scott & Morrison, 2021) confirm the unique role that high-quality artistic processes and experiences play in the cognitive and emotional development of students. Therefore, they recommend their inclusion in curricula and training for all age groups. In fact, in recent years, a large body of scientific literature has linked skill development to engagement with artistic works (Lukaka, 2023) both in university settings (Wallrauch, 2022) and in secondary education (Shin & Korean Association For Learner-Centered Curriculum & Instruction, 2022). According to Aerila and Rönkkö (2023), arts-based education offers a tool for enriching students by supporting unique ways of learning, empowering children to communicate their thoughts, feelings, and experiences and provides opportunities for them to develop their imagination, creativity, and flexible thinking.

Thus, studies on educational practices sharing artistic works as the common thread highlight the improvement in social skills among early childhood education students (Hayes et al., 2021), specifically, or show that engagement in scenic activities enhances resilience, decision-making, empathy and creativity, particularly among students facing social vulnerability (Rojas-Muñoz & Rojas-Muñoz, 2022). Also, in higher education, art emerges as an excellent tool for implementing skills. Olizko (2022) found that artistic practices integrated into engineering projects promoted communication, cooperation, creativity, and

critical and digital competencies. In this case, the art experience made learning memorable, contextualized and authentic. Additionally, research findings in the medical field indicate that visual arts-based education promises to enhance essential competencies in the education of future healthcare professionals, particularly empathy (Alkhaifi et al. 2022) and analytical thinking (Mehta & Agius, 2023).

Wang and Chia (2020) argue for the need to move away from traditional leadership models toward a transformative model that uses an arts-based approach. In terms of learning skills for management training, various theoretical perspectives highlight that art, in its various manifestations, contributes to learning and fostering thinking skills (Sköldberg et al., 2015; Sutherland, 2013) and serves as an excellent tool for the development of leadership skills (Adler, 2006). This is the case of theater (Lesavre, 2011) or dance (Sandberg et al., 2023; Winner et al., 2020).

To conduct our research, we employed the Skills & Art activity as a tool for implementing leadership skills among young people. This educational sequence involves explaining a skill through an artwork, thereby engaging a series of processes conducive to the development of analytical thinking, problem-solving, resilience and creativity. The activity was tested across three different educational levels with the objectives outlined in this article: to examine how experiential communication through art develops thinking skills among students at various educational stages and to explore the perceptions of both students and teachers regarding the implementation of each skill.

Thus, the research questions that define the study are:

How does the implementation of arts-based educational programmes affect the development of leadership, critical thinking, learning, creativity, resilience, and problem-solving skills in students from compulsory Secondary education, High school, and University? What are students' perceptions of this development? What is the teachers' assessment?

The objectives proposed are:

General objective:

To evaluate and understand the impact of arts-based educational programmes on the development of specific skills among students at different educational levels, integrating quantitative and qualitative analysis.

Specific objectives:

To explore students' perceptions and experiences at different educational levels regarding how art as an educational tool contributes to the development of specific skills.

To measure and compare the development of specific skills (leadership, critical thinking, learning, creativity, resilience, problem-solving) among students participating in the Skills & Art activity at different educational levels.

To identify possible differences in the impact of artistic tools according to the individual and contextual characteristics of the students, using a mixed approach that integrates qualitative and quantitative analysis.

Consequently, the hypotheses are:

Null Hypothesis: group means are equal, i.e. there are no statistically significant differences between the means of the evaluated educational groups (Secondary, High School and University).

Alternative Hypothesis: at least one mean is different, that is, there are significant differences between at least two of the groups.

2. Methodology

A mixed convergent design of an exploratory and descriptive nature was chosen, with a final integration stage to compare results between qualitative and quantitative methodological streams. Specifically,

discourse analysis and Likert scale surveys were employed. These instruments collect data from the innovative activity conducted with three student groups in the form of a Teaching Experiment, a sequence of teaching episodes involving the participation of a researcher-teacher, ten students per group and a researcher-observer (Steffe et al., 2000).

2.1. Activity description

The activity, called Skills&Art, aims to implement communication and leadership skills among students at different educational levels using art as an educational tool. It was conducted over two sessions for each level, held in the classroom on different days, with a one-week interval. In the first session, participants received an explanation of the entire activity. They then chose a skill and artwork they considered appropriate for explaining that skill and began crafting a brief speech lasting 2-4 minutes, combining the choices. In the second session, they presented their speech to their peers.

The Skills & Art¹ app was developed to facilitate the process, and once the guidelines had been received from the instructor, it allowed each participant to a) Access the necessary material for the activity (a list and brief explanation of the skill and museum web addresses), b) Have a space to write their speech; c) Give feedback to their peers based on four parameters (how I hear you, how I see you, something to improve, what I liked most about your speech) and send it; d) Receive feedback from peers on their communicative action; e) Self-assess the activity with a Likert scale that examines the learning of each skill.

2.2. Sample

As Draper and Swift (2011) recall, qualitative samples are always intentional since the units of analysis are chosen for a specific purpose. In our study. Three groups of students from different educational stages were selected, and due to the nature of the activity, the groups were kept small. Therefore, the sample consisted of 10 Secondary education students, 10 High school students, and 10 university students, randomly selected from which the research team had access.

The activity was conducted for each group over two sessions on different days, each lasting two and three hours, respectively. The three activities took place during the first term of the 2023–2024 academic year. Below is a table (Table 1) showing the data from the activities conducted with the three educational levels.

Informed consent to participate in the research was obtained from the students prior to the beginning of the study. In the case of minors, consent was obtained from their legal guardians. The undergraduates gave their verbal consent. The ethics committee, after studying the processes presented, gave its approval. The participants' data were anonymized, but the academic significance was not distorted.

2.3. Methodological techniques

A qualitative discourse analysis and a Likert questionnaire were conducted.

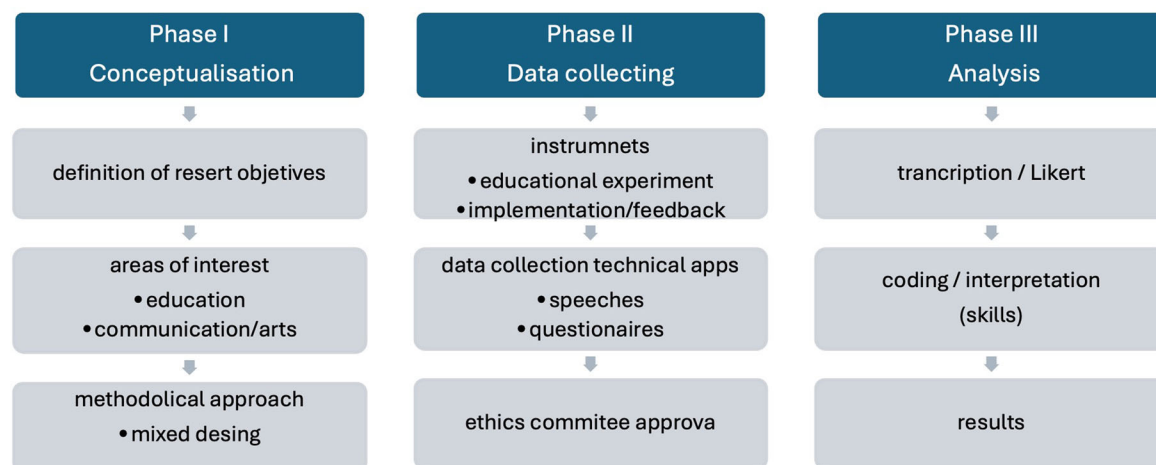
The qualitative discourse analysis allowed us to explore the perceptions and experiences of students in depth. Specifically, it ascertained the development of the following skills: a) Analytical thinking (connection between the skill and the artwork), b) Learning strategies (use of new information about the skill and artwork), c) Creativity (focus of the speech, rhetorical resources used).

Table 1. Data from the educational activity.

Groups/students	Time	Place	Activities	Data collection
- secondary education 10 students	Session 1: 2 h Session 2: 3 h	Classroom	- Explanation Personal work, drafting of the speech	Speeches Likert Survey
- high school 10 students	Session 1: 2 h Session 2: 3 h		- Execution: Presentation of speeches	
- university 10 students	Session 1: 2 h Session 2: 3 h		- Feedback and evaluations	

Table 2. Content of the Likert scale for students.

Self-assessment of the activity	
Analytical thinking Learning strategies Problem-solving	The speech performed shows a strong connection between the artwork and leadership skills. I have acquired new information about the skill by making an excellent contribution. During the process of the activity, I have applied the information to reach an appropriate solution in all three phases: explanation, staging and feedback in an excellent way.
Resilience, stress tolerance and flexibility Innovation, creativity and initiative	I didn't lose composure, I felt positive, and I kept the momentum excellently. I drafted a creative and innovative speech with excellent content.

**Figure 1.** Outline of the research design.

It includes the 3 phases of the methodological process: conceptualization, data collection and analysis.

The Likert scale (Table 2) is composed of five indicators to assess the learning in each of the skills. Responses, measured on a five-point scale, range from Strongly agree to Strongly disagree. Thus, Critical thinking is evaluated by asking about the connection between the chosen skill and artwork, Learning Strategies are assessed by inquiring whether new information about the skill and artwork was provided, Creativity is measured by focusing on the approach of the speech and the rhetorical resources used; Resilience was evaluated by considering whether the student maintained composure and momentum; and Problem-solving was assessed by determining whether the information was applied correctly to reach an appropriate solution in all phases of the activity.

The students were asked the same questions to self-assess their achievements in the activity, and the teacher assessed the learning perceived in each student for each skill. The relationship between the qualitative and quantitative methodological stream in the research is direct, with both methods integrated before the final interpretation.

Data was analyzed using the qualitative analysis software MAXQDA 2023. Each speech was entered into the program, constituting the sampling unit. The analytical phases were developed. In the coding of the speeches, recurring themes were identified, specific mentions of skills were noted, the relationship of each skill to the artwork was examined, and creative elements of the speech and rhetorical figures were coded. Figure 1 shows the research methodological design.

3. Results

3.1. Qualitative analysis

The qualitative discourse analysis allowed for an in-depth exploration of students' perceptions and experiences. Specifically, it assessed the development of the following skills: Analytical thinking, learning strategies and creativity. For analytical thinking, the connection students made between the skill and the chosen work of art was examined. Learning strategies were tested by checking whether students introduced new information about the skill or the artwork in their discourse; and creativity was analyzed mainly by looking at the rhetorical figures used in the content of the discourse, with special emphasis

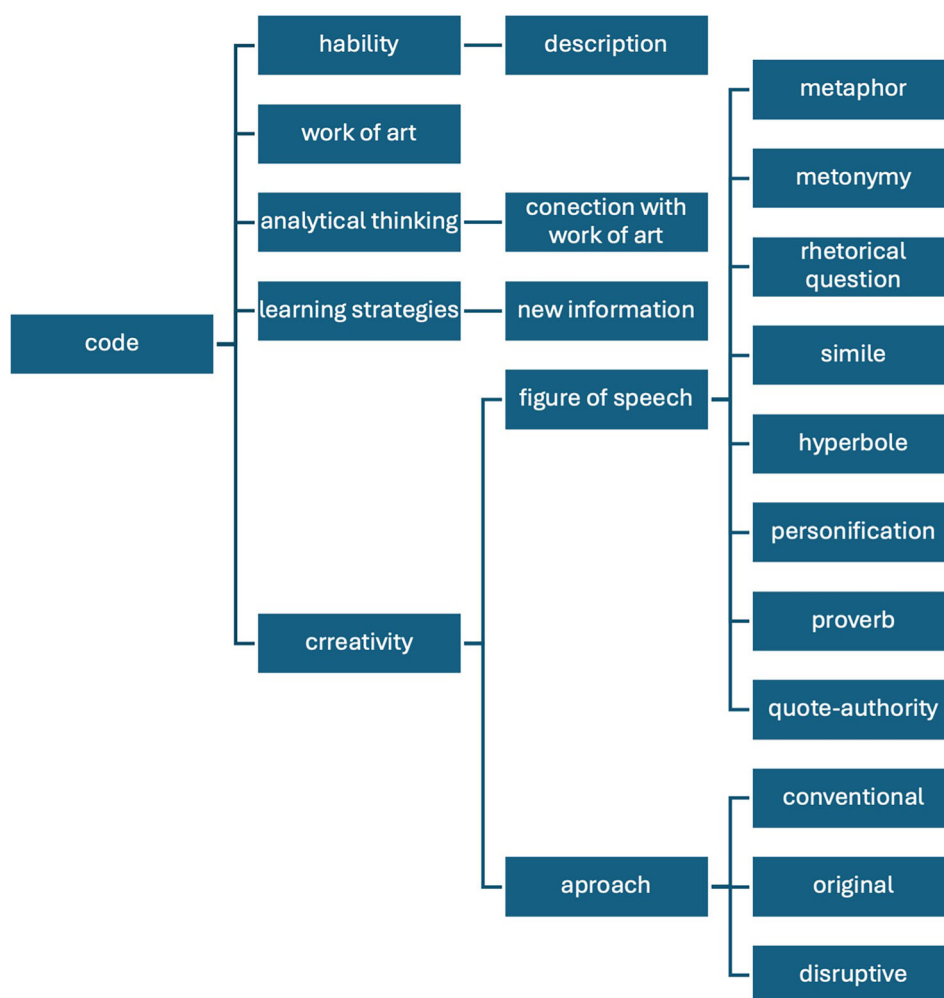


Figure 2. Coding in the qualitative analysis.

Compilation of the codes entered in the MAXDA program for the qualitative analysis of the students' discourses.

on metaphors. Creativity was also examined in form, for which the approach adopted by each participant's written presentation, whether disruptive, creative or conventional, was examined.

In Figure 2 the distribution of codes is presented. This coding scheme (Corbin & Strauss, 2014) starts from the concepts shuffled in the conceptual framework intended to be analyzed. A second coder was assigned to code a subsample of transcripts (10% of the transcripts), in order to control for coding reliability by calculating an inter-coder reliability. A Cohen's kappa value of 0.82 was achieved, indicating good inter-coder agreement.

3.1.1. Analytical thinking

The analysis of the speeches reveals that the analytical thinking strategy was developed in almost all students (93%). The High school group implemented the skill at 100%, while the university and Secondary Education groups did so at 90%, respectively.

The obtained data indicate that, in general, the experiment participants delivered speeches demonstrating a strong connection between the chosen artwork and the leadership skill, as shown in the following examples.

This painting, beyond its artistic perfection, serves as a foundation for critical thinking. Picasso challenges us to question the conflict's very nature and analyze the motivations that lead to such atrocities. 'Guernica' is not a mere passive painting; it demands our participation, pushing us to confront uncomfortable truths about the human condition. As spectators, we feel compelled to question our role in preventing the recurrence of such horrors in humanity. • Univ. (7)

This work perfectly represents creativity. The melting clocks, the paramo, or desert-like landscape with suggestive colors that seemingly combine randomly express the authors' reflection on the passage of time. What's intriguing is that although we all understand its meaning, no other artist has ever represented the passage of time in this way. • Hs. (4)

I think that in this painting, what Goya wanted to show was that violence is not the solution to problems and that there are many better ways to achieve goals without causing harm, and that if we all thought more about others and less about our own good, we would all live better • Sec. (6)

3.1.2. Learning strategies

The learning strategies skill was implemented by 70% of the participants. However, it was not applied uniformly across the three analyzed groups. In the university group, only three speeches (30%) reflected the acquisition of new information about the artwork. While the university students' speeches were longer and more elaborate than those of the younger students, they refrained from including new information about artistic elements. Instead, they focused on recounting their experiences- especially their professional experiences- or sharing their personal views on the skill in question. This contrasts with the two other groups- High school and Secondary education- in which all but one student in each group (90%) demonstrated that they had researched to provide new information, whether about the artist, the social context of the scene depicted, or some aspect related to the skill. Nevertheless, the new information presented by these two groups was brief and referred to a specific fact. This is evident in the following texts:

The scene is an idealization of the events that took place during the popular uprisings known as «*las Tres Gloriosas*» (The Three Glorious Days), which occurred in response to King Charles X's restrictive measures on civil liberties. • Hs. (5)

After reading a bit about this painting, I found out that some people think it represents the planet Venus, which leads me to the conclusion ... • Sec. (10)

3.1.3. Creativity

This skill was analyzed by considering the presence and use of diverse rhetorical figures. Special attention was given to those figures of thought that represent a more creative divergence from language, while disregarding rhetorical figures typically found in oral and informal language, i.e. figures of addition (insistences, onomatopoeias, repetitions) or figures of suppression (ungrammaticality, apocope). A total of 149 figures rhetorical figures were coded: metaphor (95), personification (18), rhetorical question (14), metonymy (8), comparison (5), quotation of authority (2), proverb (2), hyperbole (2). In general terms, this data shows an average of 5 figures of thought per speech. Table 3 provides the percentages of the use of each figure in each student group.

As can be seen in Table 3, the prevalence of figures varies considerably depending on the group analyzed. The figures appearing in all groups include metaphor, metonymy, personification and rhetorical questions. Metaphors are the most prevalent in all university speeches, 90% of High school students' speeches and 80% of Secondary education speeches. Personification appears in 50% of university students' speeches and 30% of High school and Secondary students' speeches, respectively. Rhetorical questions are used by 50% of university and High school students and only 10% of Secondary

Table 3. Percentage of rhetorical figures.

Rhetorical figure	Univ	Hs	Sec	Total
Comparison	20.00%	20.00%	0%	13.30%
Quotation-authority	30.00%	10.00%	0%	13.30%
Proverb	0%	10.00%	10.00%	6.70%
Hyperbole	0%	0%	10.00%	3.30%
Personification	50.00%	30.00%	30.00%	36.70%
Metonymy	50.00%	10.00%	20.00%	26.70%
Rhetorical question	50.00%	50.00%	10.00%	36.70%
Metaphor	100.00%	90.00%	80.00%	90.00%
N = participants	100.00	100.00	100.00	100.00

The % of the use of each rhetorical figure used by each group of students is shown. The data was provided by the qualitative analysis program used in the research.

education students. Metonymy is present in 50% of university students' speeches, 20% of Secondary education students and 100% of High school students. The results highlight the predominance of metaphors in all students' discourses.

Considering the use of rhetorical figures across different educational levels:

The university group is the most prolific and stands out for the abundant use of metaphors (70 out of the 95 found). Below are examples of the figures employed by the participants who used these rhetorical resources most. *Univ.* (3).

Metaphors: 'I wanted to explore a crucial chapter of history with you. The roar of war echoed in our hearts, the silent heartbeat of the rear guard; it is a beacon that illuminates our path today'. Comparisons: 'Women emerged as pillars of resilience' and 'malleable like clay.' Personification: 'rigidity is not our ally'. Metonymy: 'humanity faced unimaginable challenges'.

The High school group also used highly creative figures. Examples include Metaphors: 'forge our own garden of possibilities'. *Hs.* (3), 'Most people get stuck at the bottom of the box'. *Hs.* (4), 'moving forward guided by freedom'. *Hs.* (5). Comparison: '(They) Inspired us to be malleable like clay'. *Hs.* (10). Personification: 'Surely this image sounds familiar'. *Hs.* (5).

Examples of the use of these rhetorical devices in the Secondary education group include:

Metaphors: 'In darkness, there is a window through which to escape, to find the way forward' *Sec* (1), 'Wall of silence'. *Sec.* (2). '... a city in the distance, where we are born, and the sea on the horizon represents death to me'. *Sec.* (3) '... without getting blood on your hands' *Sec.* (7). Personification: 'The time you have allowed your idea to grow, to surpass itself, as hard you have worked for it'. *Sec.* (5). Hyperboles: 'infinite possibilities'. *Sec.* (10).

Regarding the form of the speech, only five out of the total examined exhibited an approach that could be classified as original compared to the rest, which has followed a conventional or academic structure (introduction, skill and artwork presentation, explanation and conclusion). These five more creative speeches share the characteristic of beginning with either a quotation from an authority or a rhetorical question to capture the listeners' attention. Three were from the university group, one from the High school group, and one from the Secondary education group.

3.2. Quantitative analysis

The data collected from the Likert scale encompassed self-assessments by students from various educational levels regarding their acquisition of five skills through art: critical thinking, learning strategies, problem-solving, resilience, stress tolerance and flexibility, and innovation, creativity and initiative. The average in each column represents the central value of the data, indicating values tend to cluster around these numbers. Conversely, the standard deviation is used to measure dispersion to determine how much individual values deviate from the mean in each column.

3.2.1. Secondary school students

Below are the results obtained from the application of the experiment to Secondary education students (Figure 3).

Based on the results obtained from the administered instrument and presented in the above figure, which refer to the self-assessment of learning by Secondary education students, the following trends are observed:

Analytical thinking (Average: 4.3; Standard Deviation \approx 0.57): The standard deviation shows moderate dispersion around the average, suggesting students developed a varied connection between the artwork and analytical thinking, demonstrating diverse levels in this skill.

Learning Strategies (Average: 4.3; Standard Deviation \approx 0.49): A moderate dispersion around the average indicates a solid but variable assimilation of leadership training by the students.

Problem Solving (Average: 4.2; Standard Deviation \approx 1): The high standard deviation and significant dispersion around the average suggest substantial variability in the application of problem-solving skills.

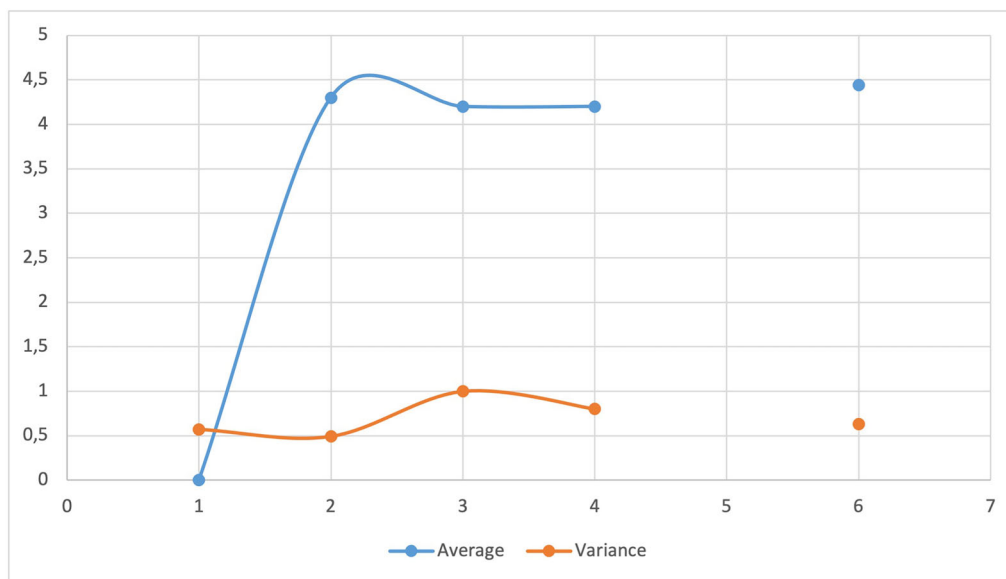


Figure 3. Self-assessment of learning of various skills acquired by Secondary education students through the Skills & Art activity.

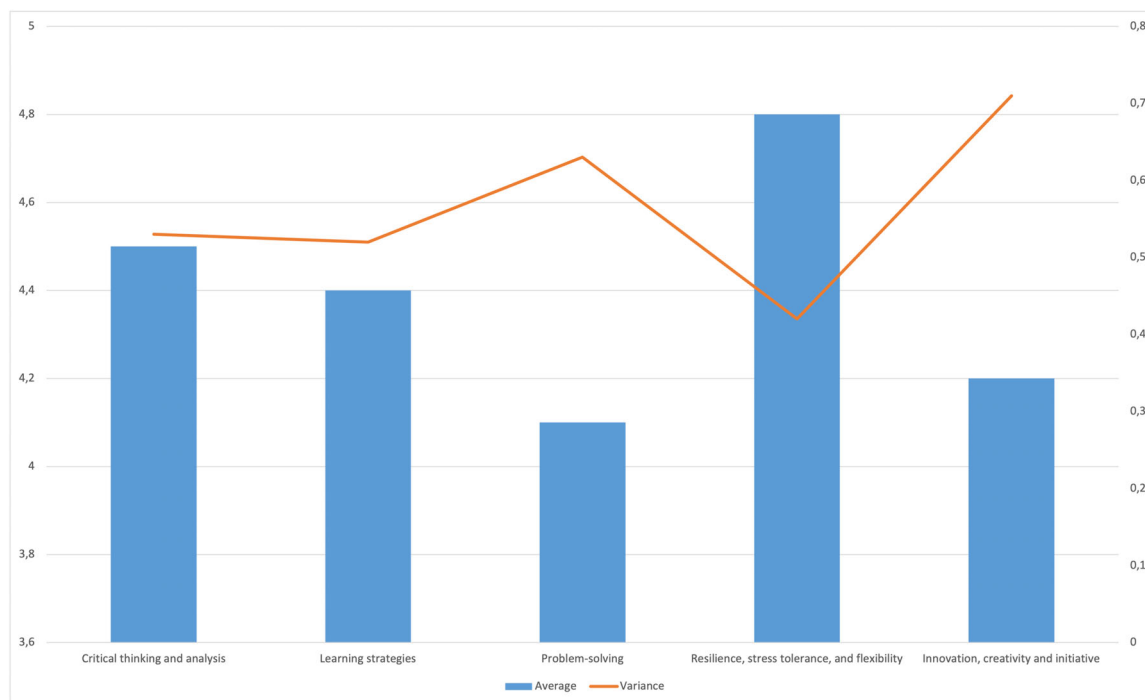


Figure 4. Self-assessment of learning of various skills acquired by High School students through the Skills & Art activity.

Resilience, Stress Tolerance and Flexibility (Average 4.2; Standard Deviation ≈ 0.83): There is a significant dispersion around the average, indicating variability in resilience, stress tolerance and flexibility in different situations, with some students showing higher stress tolerance than others.

Innovation, Creativity and Initiative (Average: 4.4; Standard Deviation ≈ 0.63): The standard deviation shows moderate dispersion, indicating variety in the acquisition of this skill. This suggests that students exhibit different levels of creativity, innovation and initiative in their development.

3.2.2. High school students

In the analysis conducted with High school students, according to the data from the administered instrument, the following trends were observed for each assessed indicator (Figure 4).

Analytical thinking (Average 4.5; Standard Deviation ≈ 0.53): Moderate dispersion around the average was evident, indicating a solid and consistent connection between the artwork in terms of analytical thinking among students.

Learning Strategies (Average: 4.4; Standard Deviation ≈ 0.52). The standard deviation suggests moderate dispersion around the average, indicating a solid but variable assimilation of new information about leadership skills, with some cases showing more outstanding performance than others.

Problem-solving (Average: 4.1; Standard Deviation ≈ 0.63): A moderate dispersion around the average is observed, which indicates that a variable application of information to solve problems by High school students is observed, with some cases showing more outstanding performance than others.

Resilience, Stress Tolerance, and Flexibility (Average: 4.8; Standard Deviation ≈ 0.42): The low standard deviation and the data's proximity to the average indicate that the tool used consistently developed these skills in different situations.

Innovation, Creativity and Initiative (Average: 4.2; Standard Deviation ≈ 0.71): A high standard deviation and a significant dispersion around the average is observed, indicating a variety of opinions regarding the acquisition of these skills within the content.

3.2.3. University students

The results obtained from the university students, as depicted in Figure 5, reveal significant findings regarding various cognitive and emotional skills.

Regarding Analytical Thinking, with an average of 4.8 and a Standard Deviation close to 0.4, there is evidently a low dispersion, suggesting that the data is very close to average- This trend indicates a strong connection between the artwork and leadership skill, particularly regarding analytical thinking.

On the other hand, regarding Learning Strategies, with an average of 4.9 and an approximate Standard Deviation of 0.3, a low dispersion is observed again. This highlights an excellent assimilation of the strategy of learning new information about leadership skills, with consistent contributions to learning. Regarding Problem Solving with an average of 4.7 and a Standard Deviation around 0.48, there is moderate dispersion around the average. This suggests a solid application of information to solve problems, enabling students to show consistent skills in this area. However, significant dispersion around the average is observed when analyzing Resilience, Stress Tolerance and Flexibility, with an average of 3.6 and a Standard Deviation of around 0.65. This suggests variability in the development of these skills in different situations. Regarding Innovation, Creativity and Initiative, with an average of 4.8 and a Standard Deviation around 0.4, again, a low dispersion is evidenced- This indicates that according to university students' perceptions, the tool fosters consistent levels of creativity, innovation and initiative in the content. To sum up, the results suggest a strong connection and consistency between the artwork and leadership skills, especially in terms of analytical thinking, learning strategies and problem-solving-

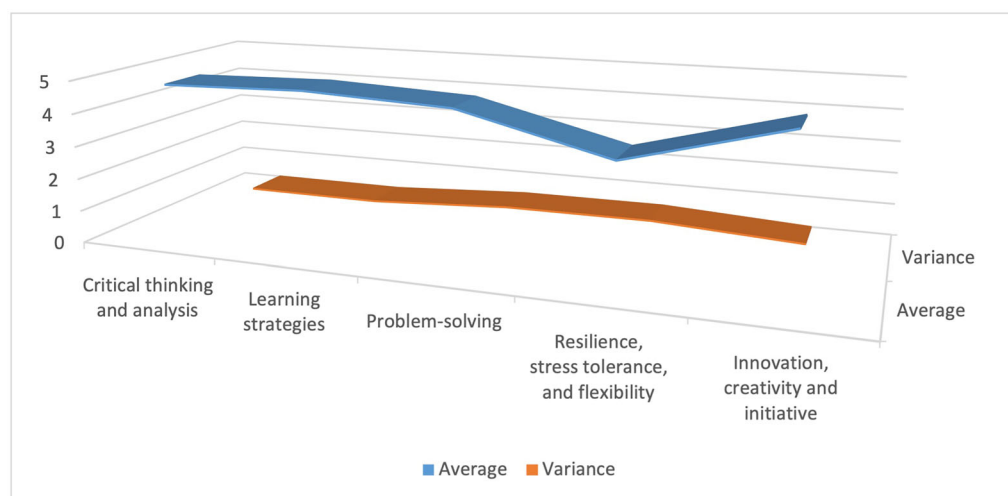


Figure 5. Self-assessment of learning of various skills acquired by university students through the Skills & Art activity.

Table 4. Evaluation by Secondary education teachers.

Dimension	Average	Variance
Analytical thinking	4.6	0.49
Learning strategies	4.3	0.49
Problem-solving	4.6	0.63
Resilience, stress tolerance and flexibility	4.3	0.79
Innovation, creativity and initiative	4.7	0.47

Table 5. Evaluation by High school teachers.

Dimension	Average	Variance
Analytical thinking	4.1	0.51
Learning Strategies	4.3	0.45
Problem-Solving	4.1	0.45
Resilience, stress tolerance and flexibility	3.7	0.73
Innovation, creativity and initiative	3.6	0.63

However, there is variability in resilience, stress tolerance and flexibility as well as innovation, creativity and initiative.

3.2.4. Teachers' evaluation of students

Secondary education teachers evaluated students' learning, as shown in Table 4.

Regarding Analytical thinking, Secondary education teachers reported an average of 4.6 and a Standard Deviation of 0.49. This moderate dispersion around the average suggests a solid and consistent connection between the artwork, leadership skills, and the consistent development of analytical thinking.

A similar trend to analytical thinking is observed in Learning Strategies, with an average of 4.3 and a Standard Deviation of approximately 0.49. The moderate dispersion around the average indicates a solid assimilation of new information about leadership skills, with contributions consistent with the learning strategy.

For Problem-Solving, with an average of 4.6 and a Standard Deviation close to 0.63, moderate dispersion around the average is evident. This suggests a solid application of information to solve problems at different stages of the process, demonstrating consistent skills in this area.

Regarding Resilience, Stress Tolerance and Flexibility, with an average of 4.3 and a Standard Deviation of approximately 0.79, significant dispersion around the average is observed. This indicates variable resilience and flexibility in different situations, with some cases showing higher stress tolerance than others.

Finally, the Innovation, Creativity and Initiative indicator reflects an average of 4.7 with a Standard Deviation of around 0.47. The moderate dispersion around the average suggests the development of creative and innovative elaboration of content, with initiatives consistent with expressing original ideas.

High school teachers evaluated students' learning as shown in Table 5.

Analytical Thinking (4.1 ± 0.51): The moderate dispersion around the mean indicates a strong and consistent connection between the data and leadership skills, developing solid and consistent analytical thinking. Learning Strategies (4.3 ± 0.45): Moderate dispersion around the mean suggests a solid assimilation of new information on the leadership skill, with consistent contributions to learning strategies. Problem-Solving (4.1 ± 0.45): The standard deviation shows moderate dispersion around the mean, indicating a solid application of information to solve problems, demonstrating consistent problem-solving skills.

Resilience, Stress Tolerance and Flexibility (3.7 ± 0.73): Significant dispersion around the mean suggests variability in resilience, stress tolerance and flexibility in different situations, possibly showing greater stress tolerance.

Table 6. Evaluation by university lecturers of various skills acquired by university students in the Skills & Art activity.

Dimension	Average	Variance
Analytical thinking	4.9	0.3
Learning strategies	4.9	0.3
Problem-solving	4.8	0.36
Resilience, stress tolerance and flexibility	4.2	0.57
Innovation, creativity and initiative	4.1	0.74

Innovation, Creativity, and Initiative (3.6 ± 0.63): The standard deviation shows moderate dispersion close to the average, which suggests variable development of creativity and innovation in the content but a consistent expression of original ideas.

Finally, the evaluation by university lecturers is shown in Table 6.

Analytical Thinking (4.9 ± 0.3): The low standard deviation indicates that the data is very close to the average, which suggests a strong connection between the artwork and leadership skills, with solid and consistent analytical thinking.

Learning Strategies (4.9 ± 0.3): The low standard deviation shows that the data are very close to the average. This indicates that university teachers highly value assimilating new information-generating leadership skills with consistent contributions to learning strategies.

Problem Solving (4.8 ± 0.36): The low standard deviation demonstrates that the data is very close to the average, indicating a solid application of information to solve problems and the effective development of this skill.

Resilience, Stress Tolerance and Flexibility (4.2 ± 0.57): The standard deviation suggests moderate dispersion around the average, indicating variable resilience and flexibility in development and probably with some cases showing higher stress tolerance than others.

Innovation, Creativity and Initiative (4.1 ± 0.74): The standard deviation suggests significant dispersion around the average, indicating various levels of creativity and innovation and some initiative.

An ANOVA analysis² was carried out to determine whether there were statistically significant differences in the self-assessment of skills between the educational levels: secondary school, high school and university.

Means were taken: 4.3 (High School), 4.4 (High School), 4.8 (University) and standard deviations: 0.57, 0.52, 0.40. Where, the F: value represents the ratio between the variance between groups and the variance within groups. If FFF is greater, it indicates that the differences between group means are greater compared to the within-group variance, which could be statistically significant. *p*-value: The probability of observing an equal or more extreme FFF value if the null hypothesis is true. If $p < 0.05$, $p < 0.05$, $p < 0.05$, we would reject the null hypothesis.

In this matter, the ANOVA results indicated that F: 0.887, *p*-value: 0.437, and since the *p*-value is greater than 0.05, we cannot reject the null hypothesis ($H_0H_0H_0$): 'The means of all groups are equal and if we reject the alternative hypothesis ($H_aH_aH_a$):' At least one mean is different'. Because these values indicate that there are no statistically significant differences between the educational groups, since the *p*-value is greater than the conventional significance level ($\alpha = 0.05$).

It shows that perceptions of skill development are consistent across educational levels. However, it is important to consider that the lack of statistical significance does not necessarily imply that there are no real differences, but rather that these differences might not be large enough.

Figure 6 below shows the results from ANOVA.

4. Discussion

The results of this research show us that students who have performed the activity Skills & Art perceive it positively as a skills booster. All students, from Secondary Education, High School and University, have

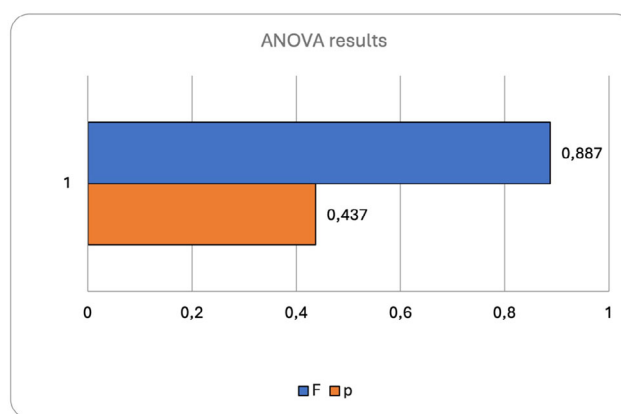


Figure 6. Results of ANOVA.

The obtained F-value of 0.887 and p-value of 0.437, is higher than the commonly used significance level ($\alpha = 0.05$). This means that there is insufficient evidence to reject the null hypothesis and that no statistically significant differences were found between the means of the educational groups.

successfully implemented leadership skills, critical thinking, learning, creativity, resilience and problem solving. Therefore, this study specifies the recommendations to create experiential or experiential programs that integrate social, cognitive and emotional skills at all educational levels, and foster the development of critical thinking, inquiry, effective communication, open-mindedness and intercultural awareness (Dickson et al., 2018; Özkeskin, 2024). Furthermore, the research reinforces the Framework for Culture and Arts Education document recently presented by UNESCO (2024), which recognizes culture and the arts as a fundamental part of holistic and inclusive development, resilience, and the overall well-being of individuals and societies.

On the other hand, qualitative discourse analysis allowed us to delve into students' perceptions and experiences regarding the impact of the application of educational innovation associated with art and the development of specific leadership skills. It was found that students demonstrated a connection between art and the improvement of analytical thinking, learning strategies and creativity. The latter skill was shown to a lesser degree and with significant differences between secondary school, high school and university students. As for the form of the discourse, the majority followed a conventional structure and only 16% presented in an original or disruptive way.

The findings of this study have important implications for both educational practice and theory. The use of art-based tools can transform traditional teaching approaches by integrating creative elements that foster not only the acquisition of specific skills, such as critical thinking and creativity, but also the active participation of students in their learning.

Although the ANOVA revealed no significant differences between the educational groups, this does not invalidate the positive impact of the art-based activities, as reflected in the qualitative analysis. The qualitative results show that the rhetorical figures used by students reflect a remarkable development of leadership and analytical thinking skills, which demonstrates the effectiveness of the art-based methodologies.

Finally, while the differences were not statistically significant according to ANOVA analysis, it is possible that these artistic methodologies impact in subtle, qualitative ways that are not easily captured in quantitative analyses. This finding highlights the importance of integrating mixed approaches in future research that can explore both measurable differences and qualitative nuances of creative learning.

These findings support experiential and constructivist learning theories, which argue that students learn best when they actively engage in activities that integrate their personal and emotional context (Kolb, 2014). Furthermore, the results suggest that the use of creative tools can help bridge the gap between theoretical skills and their practical application, a challenge recognized in the educational literature (Zhukova, 2022; Wang & Chia, 2020).

On the other hand, one of the limitations is the small sample size, which affects the generalizability of the results. Due to the nature of the activity, we were only able to experiment with one educational institution per educational level, and the sample was evaluated in general without gender differences.

Future research should consider a larger and more diverse sample to validate findings. This may have affected the ability of statistical analysis to detect significant differences between educational groups. In future studies, it is recommended to work with larger samples that include a wider variety of participants to obtain more representative results.

These limitations imply that the current findings must be interpreted and applied primarily to the context in which the study was conducted. Nevertheless, they offer a valuable starting point for exploring the impact of art-based tools in education, which should be validated through further research with greater representativeness. Also, for future studies, one can expand the sample size and recruit participants from diverse educational and cultural contexts; or conduct longitudinal studies to assess the long-term impact of creative tools on the development of specific skills.

Certain groups may have shown differences in skills such as creativity or resilience due to contextual factors, such as differences in access to educational resources or prior experiences with arts activities. For example, students at higher educational levels may have had more opportunities to develop creative skills through interdisciplinary projects, which would explain higher performance in these areas.

5. Conclusions

Based on the data obtained from quantitative and qualitative analysis, we can conclude that the proposed research objectives have been achieved: the didactic innovation has had a positive impact on the development of specific skills among students at different educational levels. The study allowed for the exploration of students' perceptions, measurement of skill implementation, and comparison across levels.

Firstly, it was observed that most participants demonstrated development in analytical thinking, particularly their ability to establish connections between artworks and specific skills like leadership. Secondly, the activity also strengthened learning strategies, although differences in how students from different academic levels approached this skill were observed. While university students focused more on sharing personal experiences, Secondary and High school students showed a greater inclination toward acquiring new information about the artwork, indicating an adaptation of the approach relative to the educational level. Thirdly, the activity fostered creativity across all the student groups, with rhetorical figures, especially metaphors, being a commonly used resource by participants. This underscores art's efficacy as a tool for stimulating creative expression and critical thinking irrespective of educational level. Regarding resilience and problem-solving, participation in art-based activities can strengthen these skills by encouraging exploration, experimentation and the ability to overcome creative challenges.

Regarding the self-assessment of learning acquired through the applied innovation, different perspectives were observed among Secondary education, High school and university students as well as among teachers at each educational level. For Secondary education students, the disruptive tool not only connects them with the artwork but also helps them develop leadership skills, such as analytical thinking, problem-solving, resilience, stress tolerance and flexibility, all with notable levels of creativity, innovation and initiative. In the case of High school students, their self-assessment focuses on a high average in the development of analytical skills. However, there is greater dispersion and a lower average regarding innovation, creativity and initiative. On the other hand, university students positively rate the tool as a learning strategy, highlighting a high average and low dispersion, especially in the development of analytical thinking, problem-solving, innovation, creativity and initiative. However, resilience, stress tolerance and flexibility show a moderate average.

Regarding teachers' evaluations, there is a similar trend in their perception of Skills&Art's effectiveness in developing leadership skills among their students. However, teachers' assessment of innovation at each educational level shows variations in the skills they consider are most strengthened by the tool, which suggests the importance of adapting the tool's application according to each student group's specific needs and characteristics.

In summary, the evaluation findings indicate that the Skills&Art tool has had a positive impact and has proven effective in promoting the development of leadership skills among Secondary education, High school and university students. Nevertheless, variations in perceptions and assessments of its efficacy may arise depending on the student's educational level and specific needs.

It should be noted that the quantitative data do not contradict the qualitative observations, but rather underline a consistent application of the educational model in question, highlighting its potential to be widely implemented without risks of inequality of impact between educational levels. This result reinforces the hypothesis that artistic tools can promote transversal skills in a diverse educational framework.

The findings of this study have significant scope and practical implications that benefit diverse educational stakeholders. As such, they provide teachers with a practical framework for integrating arts tools into the classroom. Art-based activities can foster key skills such as critical thinking, creativity and leadership, regardless of educational level. This demonstrates that these methodologies not only improve student engagement, but also contribute to deeper and more meaningful learning. Educators can adapt these activities to promote problem solving and individual expression, enhancing the educational experience.

With regards to students, artistic tools provide them with an environment that fosters self-reflection, self-expression and collaboration. This is especially relevant in a world of work that is increasingly focused on soft skills. The observed uniformity in the impact of arts activities across educational levels suggests that all students, regardless of their background, can benefit from these strategies.

Furthermore, the quantitative and qualitative findings support the need for innovative pedagogical frameworks that address not only knowledge acquisition, but also the student's holistic development. These results generate new lines of research to explore how artistic tools can address individual differences in skills such as creativity and resilience. Furthermore, this study suggests that integrating quantitative and qualitative methods allows for a more holistic analysis of educational effects. In summary, artistic tools not only positively impact education, but also have the potential to transform current pedagogical approaches, providing a basis for improving both teaching and learning.

Notes

1. Link to Skills@Art app: <https://skills-d6509.web.app/>.
2. ANOVA or Analysis of Variance is a statistical technique used to compare the means of three or more groups to determine if there are significant differences between them.

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About the authors



Inmaculada Berlanga-Fernández (corresponding author) is a PhD in Philology and PhD in Social Science. She is Professor of Communication at the International University of La Rioja. She has 3 sexennials of research. Her main research interests are audiovisual rhetoric, edumunication and digital semiotics. Currently, she is the Director of the research group *Prospectivas en Comunicación Multimedia (PROCOMM)*, Main Researcher of several projects, among them Development of leadership skills based on experiential art communication, *Unir Skills&Art*, to which this research is linked. She is also the promoter and coordinator of the Ibero-American Network on Prospects in Multimedia Communication and Humanism; as well as researcher of the Euro-American Inter-University Network of research on media competences for citizenship, *Alfamed*.

M^a Helena Vales-Villamarín is a PhD in History. Associate Professor at the International University of La Rioja. Member of the Pedagogical Department of Attendis and Coordinator of Educational Projects for Primary, Secondary and High school. She is a Member of the Research Group *Crisol Malaguide* at the University of Málaga. She carried out a research stay at UNAM (México) and at the Institute of Historical Studies of the Ibero-American Graduate

University Association (2014). She was awarded the Ernestina de Champourcin Award for Women's Studies (University of Navarra) in 2015.

Beatriz Mocchi is a Philosophy graduate, holds a Master in Cultural Management by the UIC and is currently developing her PhD in Communications at the University of Málaga. She has carried out a research stay at NOVA Lisbon and is currently part of the Andalusian Institute of Communication and Culture. Her research lies at the intersection of digital storytelling, artistic and cultural expression, and social media, exploring how these elements shape the experiences, identities, and communicative practices of new generations.

Santa Palella-Stracuzzi is a PhD in Social Communication and Expert in human resources management, leadership, internal and external communication. She holds an official master's in educational sciences and is a Specialist in Educational Planning and Evaluation. Currently, she is the Vice-Dean of Academic Organization, at EAE Madrid. Author of the book 'Methodology of Quantitative Research' with 4 editions and 2 reprints. The book received the 'Biennial Award for Best Textbook', Universidad Simón Bolívar 2004. She is part of a research group and competitive projects. Her lines of research are in the field of leadership, Educational Management, Communication, Human Resources, Educational Innovation, new technologies, Artificial Intelligence.

ORCID

Inmaculada Berlanga-Fernández  <http://orcid.org/0000-0002-0135-624X>

M^a Helena Vales-Villamarín  <http://orcid.org/0000-0002-8687-9399>

Beatriz Mocchi  <http://orcid.org/0000-0002-1201-9193>

Santa Palella-Stracuzzi  <http://orcid.org/0000-0001-6610-7079>

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