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The audiovisual scientific documentary as a dissemination strategy for the FCI geosciences project at the University of Guayaquil

El Documental Científico Audiovisual como Estrategia de Divulgación del Proyecto FCI de Geociencias en la Universidad de Guayaquil

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Abstract

Science communication faces the persistent challenge of translating research findings for non-specialized audiences, particularly in university settings where academic production rarely reaches beyond peer circles. This study examines the audiovisual documentary as a strategy for disseminating the results of a research project funded by the Competitive Research Fund (FCI) of the University of Guayaquil on rock and mineral sampling in geological formations of

Resumen

La divulgación científica enfrenta el reto persistente de trasladar hallazgos de investigación a públicos no especializados, especialmente en contextos universitarios donde la producción académica rara vez trasciende el ámbito de los pares académicos. Esta investigación analiza el formato de documental audiovisual como estrategia para divulgar los resultados del proyecto de investigación financiado por el Fondo Competitivo de Investigación (FCI) de

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continental Ecuador. Using a mixed-methods approach with a descriptive-exploratory scope and a non-experimental cross-sectional design, a structured questionnaire was administered to 114 students from the Advertising and Marketing and Geological Engineering programs, complemented on an exploratory basis by consultation with two faculty members and a semi-structured interview with the institution's research director. Results show that 86% of students were unaware of their university's FCI projects, while 76% expressed a preference for audiovisual documentaries over other science communication formats. Qualitative findings confirm the absence of institutional precedent for scientific documentary production and the need to involve both faculty and students in this process. The study concludes that the audiovisual documentary is a relevant format for narrowing the identified dissemination.

Keywords: science communication; audiovisual documentary; FCI projects; public communication of science; University of Guayaquil.

la Universidad de Guayaquil sobre muestreo de rocas y minerales en formaciones geológicas del Ecuador continental. Con un enfoque mixto de alcance descriptivo-exploratorio y diseño transversal no experimental, se aplicó un cuestionario estructurado a 114 estudiantes de las carreras de Publicidad y Mercadotecnia e Ingeniería Geológica, complementado de forma exploratoria con la consulta a dos docentes y una entrevista semiestructurada al director de investigación de la institución. Los resultados muestran que casi 9 de cada 10 estudiantes desconocía los proyectos FCI de su universidad, mientras que la mayoria expresó preferencia por el documental audiovisual frente a otros formatos de divulgación científica. Los hallazgos cualitativos confirman la ausencia de antecedentes institucionales de producción documental científica y la necesidad de articular a docentes y estudiantes en dicho proceso. Se concluye que el documental audiovisual constituye un formato pertinente para reducir la brecha de divulgación identificada.

Palabras clave: divulgación científica; documental audiovisual; proyectos FCI; comunicación pública de la ciencia; Universidad de Guayaquil.

Introduction

The social value of science does not end with its production; rather, it is complemented by its dissemination. In societies saturated with visual stimuli, there is an increasingly urgent need to translate scientific knowledge into formats that are understandable, accessible, and engaging for non-specialist audiences. However, science continues to be disseminated primarily among academic peers—through articles, specialized journals, and technical publications validated by indexing systems—which limits its social reach (Universidad de Guayaquil, 2025).

In the Ecuadorian context, the dissemination of academic and scientific content remains heavily reliant on conventional channels such as conferences, print publications, and specialized journals, even as higher education institutions have adopted digital media; this reliance limits the reach of scientific output compared to the potential offered by audiovisual and transmedia formats (Sarmiento Contreras & Zamora Arízaga, 2025). Through its Competitive Research Fund (FCI), the Universidad de Guayaquil promotes research projects conducted by faculty and advanced-level students, aiming to advance knowledge and generate social impact from within the university setting (Universidad de Guayaquil, 2025). Yet, despite the quality and relevance of this research, the findings rarely extend beyond the academic sphere.

One such project involves the sampling of rocks and minerals from geological formations in mainland Ecuador; it was developed under the University of Guayaquil's FCI (Institutional Research Fund) program, with the participation of students and faculty from the Faculties of Natural Sciences, Mathematical Sciences, and Social Communication Sciences. This project serves as the case study for the present research, as it represents a concrete, verifiable example of institutional scientific output whose dissemination to the university community has not yet been explored. Based on this case, the research aims to answer the following question: Is the audiovisual documentary a valid format for translating the findings of the University of Guayaquil's geosciences FCI project into language accessible to the university community?

From a communication perspective, the documentary constitutes a form of audiovisual representation that combines aesthetic enjoyment with the transmission of knowledge, offering a view of reality without sacrificing formal beauty (Vallejo, 2018). In this vein, audiovisual content—and the documentary in particular—acts as a bridge between science and society, enabling the transformation of complex concepts into clear, visually engaging language (Ceballos Blandón, 2019; Muñoz Gallego & Jiménez de las Heras, 2021). Recent evidence reinforces this view: message coherence, content relevance, and the integration of audiovisual elements are significant predictors of a more positive perception of science communication among university students (Izquierdo-Valladares et al., 2026), while transmedia and immersive narratives expand science's potential to connect with non-specialist audiences (Buhigas & Gifreu-Castells, 2023).

Based on this framework, the premise is established that the production of scientific-

audiovisual documentaries facilitates the dissemination of the University of Guayaquil's geosciences FCI project among the student body and faculty of the Faculties of Social Communication and Natural Sciences. The general objective of the research is to analyze the perceptions and attitudes of students and faculty from these faculties regarding the audiovisual documentary as a dissemination strategy for the project. Specifically, the study seeks to: (a) assess students' level of knowledge and interest regarding the university's FCI projects; (b) identify their preferences regarding formats and platforms for consuming scientific audiovisual content; and (c) explore the perceptions of faculty and researchers regarding the potential of the documentary as a tool for scientific dissemination.

Theoretical framework

The scientific documentary is distinguished from other documentary genres by its explicitly educational purpose: translating the specialized language of science into a narrative understandable to general audiences, without oversimplifying or distorting the content (Muñoz Gallego & Jiménez de las Heras, 2021). Its effectiveness depends largely on the audiovisual language employed (camera shots, pacing, narrative structure) and the ability to craft a story that maintains viewer interest beyond mere technical data (Vallejo, 2018). From a television-oriented perspective, León (2010) argues that the scientific dissemination documentary achieves communicative effectiveness through specific narrative, dramatic, and rhetorical mechanisms, enabling it to convey specialized content to mass audiences without compromising the rigor of the concepts presented.

It is also useful to distinguish between scientific popularization, public communication of science, and the social appropriation of knowledge—concepts often used interchangeably but which signify distinct processes: while popularization seeks to make content accessible to broad audiences, social appropriation entails the knowledge being incorporated, reinterpreted, and utilized by the receiving community (Gaviria-Velásquez, 2021). In the Ecuadorian context, this latter notion has been increasingly incorporated into public science and technology policies, although its institutional implementation across universities remains uneven (Lozano, Mendoza-Toraya, Rocha, & Welter, 2016). This work operates at the level of popularization, understood as a necessary precursor to the eventual social appropriation of the FCI project under study.

Additionally, the discussion regarding transmedia storytelling applied to scientific communication must be considered. Transmedia storytelling integrates multiple platforms and formats to expand reach and audience engagement, overcoming the limitations of conventional academic dissemination channels (Sarmiento Contreras & Zamora Arízaga, 2025). In the specific realm of scientific popularization, interactive and immersive narrative strategies enable non-specialist audiences to connect with research content in a more participatory manner (Buhigas &

Gifreu-Castells, 2023). These contributions update and complement the classic documentary approach underpinning the present study.

An additional component of this updated landscape is the shift of science communication toward digital platforms. Recent studies on science communication via YouTube by Latin American universities and museums (including cases from Ecuador) show that institutional channels tend to achieve lower reach and engagement levels than those of independent communicators, partly due to the institutions' own structural, organizational, and budgetary limitations (Ojeda-Serna & García-Ruiz, 2022). Similarly, a review of audiovisual communication strategies employed by scientific institutions identifies video duration, linguistic variety, and communication style as factors that directly influence reach (Testón Martínez & Alberich Pascual, 2023). These findings are relevant for interpreting the platform preferences reported by the surveyed students later on.

Methodology

The study employs a mixed-methods approach—predominantly quantitative with a complementary qualitative component—and has a descriptive-exploratory scope within a non-experimental, cross-sectional design. This scope is justified because, as the literature review confirmed, scientific documentation output in the Ecuadorian context is a scarcely explored field; this precludes the formulation of causal hypotheses and directs the study toward describing perceptions and dispositions (Hernández Sampieri, Fernández Collado, & Baptista Lucio, 2014).

Population and sample

The study population consisted of 224 individuals affiliated with the faculties of Social Communication (Advertising and Marketing program) and Natural Sciences (Geological Engineering program) at the University of Guayaquil, as detailed in Table 1.

Table 1. Distribution of the studied polulation

Group	N
Advertising and Marketing Students (5th, 6th and 7th semesters)	105
Geological Engineering Students	115
Advertising and Marketing Faculty Member	1
Geological Engineering Faculty Member	1
Expert Researchers from the FCI project FCI	2
Total	224

Source: Secretariat of the University of Guayaquil (2017).

The sample size was calculated using the finite population formula, with a confidence level equivalent to Z = 1.88, probabilities of p = q = 0.50, and a margin of error of e = 6%, yielding a calculated size of n = 142. The survey was administered to 114 students (50.9% of the total population and 80.3% of the calculated sample); this figure is reported as a methodological limitation in the corresponding section. Consultations with faculty members (n = 2) and an interview with the

research director (n = 1) were conducted based on convenience, given their direct involvement with the geosciences FCI project; these are expressly identified as an exploratory, non-representative qualitative component, with no claim to statistical generalizability.

Instruments and techniques

Three complementary techniques were employed. First, a literature review covering documentary production, audiovisual language, and science communication, which provided the foundation for the problem statement and categories of analysis (Gómez Luna, Fernández Navas, Aponte Mayor, & Betancourt Buitrago, 2014; Guevara Albán, Verdesoto Argüello, & Castro Molina, 2020). Second, a structured seven-item questionnaire—combining five-point Likert scales and dichotomous questions—was administered to students to measure their knowledge, interest, and format preferences regarding audiovisual science communication. Third, a semi-structured interview was conducted with the institution's research director; the interview guide addressed the institutional status of science communication and the viability of the documentary as a tool (Díaz Bravo, Torruco García, Martínez Hernández, & Varela Ruiz, 2013).

Analysis and triangulation approach

Given that the study relies solely on the aggregated percentages per question reported in the original source—rather than a database of individual responses—it was not possible to construct contingency tables linking variables at the respondent level; doing so without microdata would have required assuming relationships between responses that are unsupported by the data (an ecological fallacy). Instead, two triangulation strategies compatible with the available information were adopted: (a) descriptive triangulation among conceptually related items, comparing aggregated results from related questions to identify patterns, gradients, or contradictions in the response structure; and (b) classic methodological triangulation, contrasting the quantitative survey findings with qualitative information from the professors consultation and the interview with the research director. Both strategies are applied in the Results and Discussion sections and are explicitly identified as second-level analyses of already aggregated data, rather than as statistical tests of association.

Results

Presented below are the results of the survey administered to students (n = 114), organized by item, followed by a synthesis of the professors consultation and the interview with the research director.

Table 2. Interest in documentaries about scientific topics

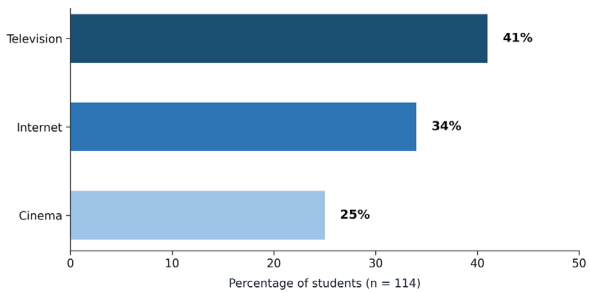
Answer	n	%
Strongly agree	56	49%
Agree	29	25%
Neutral	16	14%
Disagree	8	7%
Strongly disagree	5	4%
Total	114	100%

Table 3. Preferred audiovisual format for watching documentaries

Soporte	n	%
Television	47	41%
Internet	39	34%
Cinema	28	25%
Total	114	100%

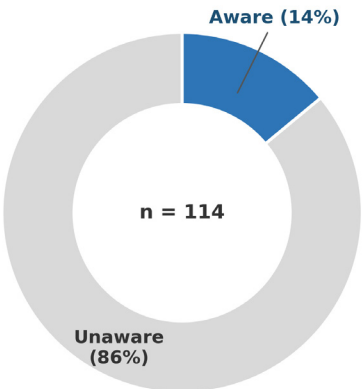
74% of students agreed or strongly agreed that documentaries on scientific topics are interesting, compared to 11% who expressed disagreement. This result suggests an underlying favorable predisposition toward the documentary format as a vehicle for scientific content, regardless of prior knowledge regarding specific institutional projects.

Figure 1. Preferred audiovisual format for watching documentaries



Television was identified as the preferred medium (41%), followed by the internet (34%) and cinema (25%). This result must be interpreted in light of when the data was collected (2017)—prior to the consolidation of streaming platform consumption in Ecuador; a current replication of the study would likely yield a different distribution, with digital platforms playing a more significant role, and this finding is therefore treated with caution in the discussion.

Figure 2. Awareness of University of Guayaquil FCI projects



The study's most striking finding is that 86% of the surveyed students were unaware of the FCI projects being carried out at their own university. This gap highlights an inadequate institutional dissemination strategy and serves as the primary empirical argument for exploring alternative formats for scientific communication.

90% of students consider communicating the university's scientific projects important for the country's economic development, indicating that

the lack of awareness reported in Table 4 stems not from a general lack of interest, but from an absence of effective dissemination channels.

Table 4. Perceptions regarding the importance of communicating scientific projects for the country's economic development

Answer	n	%
Yes	103	90%
No	11	10%
Total	114	100%

62% of students agreed or strongly agreed with receiving the FCI results via audiovisual media, compared to 21% who disagreed. The percentage of neutral responses (17%) is consistent with the low level of prior awareness regarding these projects reported in Table 4.

Table 5. Willingness to learn about FCI results in audiovisual format

Answer	n	%
Strongly agree	41	36%
Agree	30	26%
Neutral	19	17%
Disagree	15	13%
Strongly disagree	9	8%
Total	114	100%

Table 6. Agreement with audiovisual dissemination of the geosciences project (rock and mineral sampling)

Answer	n	%
Strongly agree	28	25%
Agree	36	32%
Neutral	11	10%
Disagree	23	20%
Strongly disagree	16	14%
Total	114	100%

Regarding the specific FCI project that gave rise to this study, 57% of the students agreed or strongly agreed with its dissemination in an audiovisual format. The 34% who disagreed or strongly disagreed represents a notably higher figure than in previous questions, suggesting that general interest in the documentary format (Table 2) does not automatically translate to a specific, lesser-known project; this finding is revisited in the discussion.

76% of the students expressed a willingness to participate in multidisciplinary projects aimed at producing a scientific documentary, representing a favorable foundation for implementing co-production strategies between the Faculties of Social Communication and Natural Sciences.

Triangulated analysis of the results

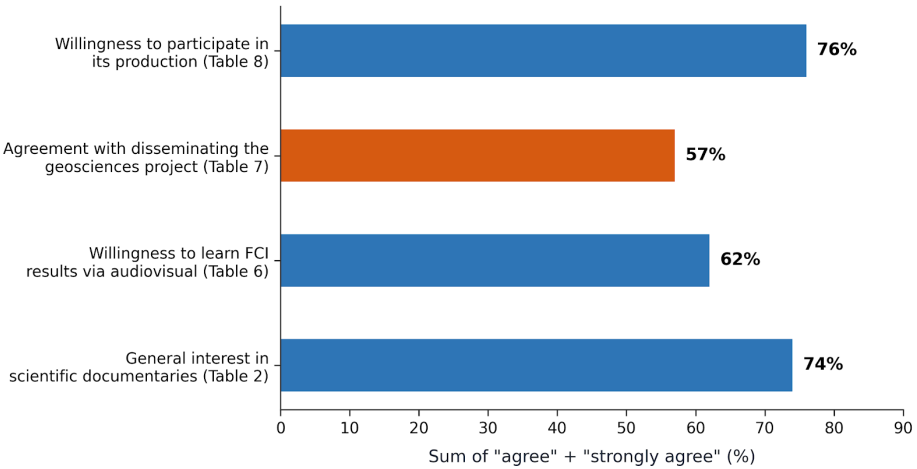
In order to enrich the interpretation of the data beyond a question-by-question report, a descriptive triangulation of conceptually related items was conducted (see the Methodology

section). Figure 3 compares the four survey items measuring interest in or willingness to engage with the scientific documentary, ordered by content: general interest (Table 2), willingness to learn about the specific FCI results (Table 5), agreement with disseminating the specific geosciences project (Table 6), and willingness to participate in its production (Table 7).

Table 7. Willingness to participate in multidisciplinary projects for the production of a scientific documentary

Answer	n	%
Strongly agree	**53**	**46%**
Agree	**34**	**30%**
Neutral	**12**	**11%**
Disagree	**9**	**8%**
Strongly disagree	**6**	**5%**
Total	114	100%

Figure 3. Comparative gradient of interest and willingness regarding the scientific documentary

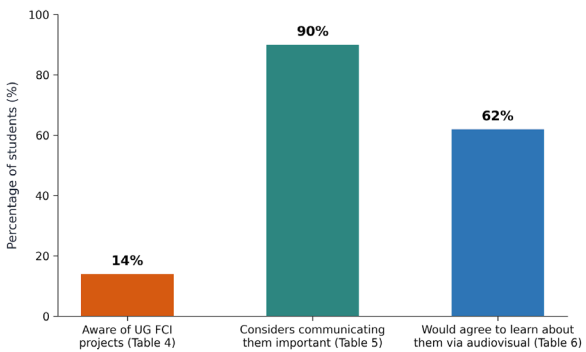


The comparison reveals a non-linear pattern that is not as clearly visible in a question-by-question analysis: general interest in the scientific documentary genre (74%) and willingness to participate in its production (76%) represent the highest figures, whereas specific agreement with disseminating the particular geosciences project (57%) is notably the lowest of the four. This suggests that student willingness does not decline uniformly as the subject of dissemination becomes more concrete; instead, it follows a "valley" pattern: enthusiasm for the format and

for participating in its creation remains high even when stated interest in a specific, lesser-known project drops. In practical terms, this supports the idea that the challenge lies not in motivating student participation—which is already high—but in crafting a specific message about the geosciences project that is as appealing as the format used to convey it.

A second comparison (Figure 4) contrasts three items that, when viewed together, reveal a gap between knowledge, attitude, and willingness to receive information: 14% prior knowledge of the FCI projects (Table 4), 90% who consider it important to communicate them (Table 5), and 62% who would agree to learn about them through audiovisual media (Table 6).

Figura 4. Gap between knowledge, perceived importance and willingness to share information



This figure demonstrates that low initial awareness does not reflect a lack of interest, but rather a disconnect between the students' positive assessment of institutional research and the actual channels through which information about it reaches them. The drop from the 90% who value the importance of communicating FCI projects to the 62% willing to learn about them specifically via audiovisual means—even though both figures represent a majority—further indicates that the audiovisual format, while highly regarded, is not automatically perceived as the channel that would bridge this gap for all students; an additional one-fifth of the group is lost between the general appreciation of the project's importance and a concrete willingness to engage with this specific format.

Faculty consultation and interview with the research director

An exploratory consultation with faculty members associated with the geosciences FCI project revealed a consensus on several points: both were in favor of disseminating FCI projects to the student and scientific communities; they considered the audiovisual documentary an appropriate format for this purpose; they expressed interest in using audiovisual tools in the classroom; and they indicated a willingness to participate in multidisciplinary documentary production projects. One faculty member noted having never previously used methods to foster communication skills regarding research dissemination among students, and both remained neutral on whether university researchers should possess basic knowledge of audiovisual production. Given the small sample size (n = 2), these results are presented as an initial qualitative approximation rather than as representative evidence of the institution's entire faculty.

The interview with the Director of Research at the University of Guayaquil complements this picture. The interviewee noted that, in recent years, the institution has prioritized research areas with significant social and economic impact, with the explicit aim of ensuring that the resulting knowledge is not confined to a small academic circle but is instead disseminated to the general public. However, he acknowledged that the university has no prior experience in producing scientific documentaries and that current outreach efforts are primarily channeled through conferences and digital publications. In concluding the interview, he highlighted the need to align student interests with faculty work so that research projects can achieve sustainable dissemination over time.

Discussion

The results reveal an institutional paradox: there is a significant lack of awareness regarding FCI projects (86%), yet a majority perceive these projects as relevant to the country's development (90%). This combination is not uncommon in studies on the public communication of science and supports the argument that the issue lies not in public interest, but in the absence of adequate dissemination channels (Sarmiento Contreras & Zamora Arízaga, 2025); these authors document a persistent reliance on conventional channels within Ecuadorian universities, to the detriment of broader-reaching audiovisual and transmedia strategies.

The stated preference for audiovisual documentaries (74% general interest; Table 2) aligns with the theoretical premise that this format translates complex concepts into visually accessible language without sacrificing rigor (Ceballos Blandón, 2019; Muñoz Gallego & Jiménez de las Heras, 2021). However, the finding in Table 7—where support for disseminating the geosciences project specifically drops from 74% to 57%—suggests that a general interest in the documentary format does not, in itself, guarantee interest in a specific, previously unfamiliar scientific topic. This is consistent with recent evidence showing that the perception of science communication is linked more to the coherence and relevance of the specific message being conveyed than to the audiovisual format in the abstract (Izquierdo-Valladares et al., 2026); in other words, the appeal of the documentary as a genre does not obviate the need to craft a specific, relevant, and well-told narrative for each research project.

The interview with the research director provides an institutional perspective that triangulates with the quantitative data: the university's lack of a track record in scientific documentary production stems not from a lack of interest within the community—confirmed by the high willingness to participate in multidisciplinary projects (76%; Table 8)—but rather from the absence of a coordinated strategy involving researchers, faculty, and students. This finding aligns with the approach of transmedia and immersive narratives applied to science, which specifically highlights the need for multi-platform and multidisciplinary integration to achieve a sustained impact in science communication (Buhigas & Gifreu-Castells, 2023).

The data regarding medium preferences (Table

3)—with television as the leading choice—must be viewed within its temporal context: the data were collected in 2017, prior to the consolidation of audiovisual consumption via streaming platforms in Ecuador. It is reasonable to expect that a current replication of this item would yield a different distribution, with a greater emphasis on digital platforms and social media as distribution channels for scientific documentaries, as suggested by more recent studies on university-based transmedia storytelling (Sarmiento Contreras & Zamora Arízaga, 2025).

However, this shift toward the digital realm should not be interpreted as an automatic solution. Evidence regarding scientific outreach on YouTube by Latin American universities and museums indicates that institutional channels tend to achieve less reach and engagement than independent communicators, largely due to structural and organizational limitations inherent to the institutions themselves (Ojeda-Serna & García-Ruiz, 2022). For a potential documentary about the geosciences FCI project to achieve real impact beyond the university's institutional channel, its distribution strategy should consider factors such as duration, narrative style, and format variety—identified as key determinants of reach in institutional audiovisual outreach (Testón Martínez & Alberich Pascual, 2023)—rather than simply transferring content from television to a digital platform without adapting the language used.

Conclusions

The research reveals a significant gap between the scientific output of the University of Guayaquil's geosciences FCI project and its effective dissemination to the university community: 86% of students were unaware of the projects' existence, even though 90% consider such communication important for the country's development. The audiovisual documentary is perceived as a suitable format to address this gap, supported by general interest in the scientific documentary genre (74%) and a high level of student willingness to participate in its production (76%).

However, the study also shows that this general interest does not automatically translate into support for a specific, lesser-known project; this suggests that a documentary's effectiveness in dissemination depends as much on the format as on crafting a concrete, coherent, and well-narrated message about each research initiative. The institutional interview confirms the lack of prior scientific documentary production at the university and highlights collaboration among researchers, faculty, and students as a necessary condition for its sustainable implementation. Taken together, these findings support the value of exploring audiovisual documentaries—and, more broadly, transmedia and digital narrative strategies—as a way to strengthen the link between university research and society. This serves as a step toward the social appropriation of knowledge generated by the geosciences FCI project, understood not merely as access to information but as its effective integration by the university community (Gaviria-Velásquez, 2021).

It is recommended that future research replicate this study using an updated sample, an instrument validated through expert judgment, and explicitly reported reliability coefficients, in

accordance with recent methodological standards such as those outlined by Izquierdo-Valladares et al. (2026). Furthermore, it is suggested that qualitative inquiries be expanded to include a representative number of faculty researchers from various schools and that a cross-variable analysis among participating academic programs be incorporated. Finally, given that the platform preference data (Table 3) reflects a context prior to the consolidation of streaming in Ecuador, it is recommended to update this component and integrate a transmedia storytelling approach into the design of future documentary pieces derived from FCI projects (Sarmiento Contreras & Zamora Arízaga, 2025; Buhigas & Gifreu-Castells, 2023).

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