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*Scientific articles*

## **Proyectos Creativos: Interdisciplinariedad y convergencia entre las Ciencias Sociales, Ciencias Exactas, el Arte y la Cultura**

***Creative Projects: Interdisciplinarity and Convergence between Social Sciences, Exact Sciences, Art, and Culture***

***Projetos Criativos: Interdisciplinaridade e convergência entre Ciências Sociais, Ciências Exatas, Arte e Cultura***

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### **Resumen**

En la Universidad Autónoma de Querétaro (UAQ), los proyectos creativos interdisciplinarios han impulsado el desarrollo de metodologías educativas innovadoras. Esto ha allanado el camino para un aprendizaje activo, crítico y creativo, lo que mejora la formación académica. Sin embargo, aún quedan algunos obstáculos para los interlocutores de la facultad que trabajan a través de disciplinas y, por lo tanto, se recomienda reforzar las estrategias institucionales para el trabajo colaborativo.

Esta investigación aplicada, exploratoria y descriptiva se centró, en gran medida, en el análisis del compromiso de la comunidad universitaria con las convocatorias relevantes de 2024. En este contexto, se realizaron encuestas a 70 estudiantes, 25 profesores y 15 artistas, y se llevaron a cabo 10 entrevistas con empleadores de los sectores público y privado. Esta investigación se propuso de la siguiente manera: identificar qué proyectos están registrados; determinar el grado de relación interdisciplinaria en el desarrollo del marco; identificar los enfoques para promover la transversalidad de los proyectos creativos.

Los hallazgos muestran un mayor compromiso estudiantil con las ciencias sociales y las humanidades, pero las facultades se orientan hacia las ciencias exactas. Según nuestros datos



hasta octubre de 2023, el apoyo financiero motiva a los estudiantes, pero la facultad se involucra en la investigación aplicada. La colaboración interdisciplinaria, por lo tanto, ha demostrado tener un mayor impacto social y mejorar la calidad de la educación, lo que subraya la necesidad de establecer criterios claros en las convocatorias para la integración de diversas disciplinas. Finalmente, se sugiere sistematizar experiencias exitosas para mejorar la enseñanza y el aprendizaje en la comunidad y cultivar generaciones críticas e innovadoras.

**Palabras clave:** proyectos interdisciplinarios, trabajo colaborativo, creatividad, educación superior.

### **Abstract**

At the Autonomous University of Querétaro (UAQ), interdisciplinary creative projects have driven the development of innovative educational methodologies. This has paved the way for active, critical, and creative learning, enhancing academic training. However, some barriers persist among faculty members working across different disciplines; therefore, it is recommended to strengthen institutional strategies for collaborative work.

This applied, exploratory, and descriptive study focused on analyzing the commitment of the university community to relevant UAQ calls for proposals in 2024. In this context, surveys were conducted with 70 students, 25 professors, and 15 artists, along with 10 interviews with employers from public and private sectors. The study aimed to: identify registered projects; determine the degree of interdisciplinary collaboration in project development; and identify approaches to promote the integration of projects across different knowledge areas.

Findings indicate higher student engagement in social sciences and humanities, whereas faculties tend to lean toward exact sciences. According to data up to October 2023, financial support motivates students, while faculties primarily engage in applied research. Interdisciplinary collaboration has thus demonstrated a greater social impact and improved educational quality, highlighting the need to establish clear criteria in calls for proposals to integrate diverse disciplines. Finally, systematizing successful experiences is suggested to improve teaching and learning within the community and to foster critical and innovative generations.

**Keywords:** interdisciplinary projects, collaborative work, creativity, higher education

## Resumo

Na Universidade Autônoma de Querétaro (UAQ), projetos criativos interdisciplinares têm impulsionado o desenvolvimento de metodologias educacionais inovadoras. Isso abriu caminho para uma aprendizagem ativa, crítica e criativa, aprimorando, assim, a formação acadêmica. No entanto, alguns obstáculos persistem para docentes que atuam em diferentes disciplinas e, portanto, recomenda-se o fortalecimento de estratégias institucionais para o trabalho colaborativo.

Esta pesquisa aplicada, exploratória e descritiva concentrou-se principalmente na análise do engajamento da comunidade universitária com as chamadas de propostas relevantes de 2024. Nesse contexto, foram realizados questionários com 70 estudantes, 25 professores e 15 artistas, além de 10 entrevistas com empregadores dos setores público e privado. A pesquisa teve como objetivos: identificar quais projetos estão registrados; determinar o grau de interdisciplinaridade no desenvolvimento do arcabouço curricular; e identificar abordagens para promover a transversalidade dos projetos criativos. Os resultados demonstram maior engajamento dos estudantes com as ciências sociais e humanas, mas as faculdades tendem a privilegiar as ciências exatas. De acordo com nossos dados até outubro de 2023, o auxílio financeiro motiva os estudantes, mas o corpo docente está mais envolvido em pesquisa aplicada. A colaboração interdisciplinar demonstrou, portanto, ter um impacto social maior e melhorar a qualidade do ensino, ressaltando a necessidade de estabelecer critérios claros em editais de projetos para integrar diversas disciplinas. Por fim, sugere-se que as experiências bem-sucedidas sejam sistematizadas para aprimorar o ensino e a aprendizagem na comunidade e cultivar gerações críticas e inovadoras.

**Palavras-chave:** projetos interdisciplinares, trabalho colaborativo, criatividade, ensino superior.

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## Introduction

Interdisciplinarity should be discussed from the outset when proposing projects, especially where art and the exact sciences fully coexist, as it will offer a way to address some difficult problems. Collaboration among members of different academic units is necessary to meet these challenges. The benefits of interdisciplinary work can be demonstrated, and programs that foster collaboration across disciplines can be designed.

The interest in these approaches is evident, leading to the development of academic programs that inspire students to respond to societal challenges in innovative ways, such as climate change, sustainability, and public health. This process emphasizes the need for collaborative thinking, linking fields considered disparate (e.g., social sciences, sciences, art, and culture). But this momentum of projects that tackle difficult problems through interdisciplinary discussion and conversation needs to be strengthened, enhancing the potential for individuals to change the social world with creative and high-impact ideas.

Through this approach, interdisciplinary projects have proven to be innovative in educational practice and have fostered the convergence of different skills and methods among the participating disciplines at the Autonomous University of Querétaro (UAQ). These projects promote active learning in which students develop critical, investigative, and creative skills while working on solutions to social, environmental, economic, academic, and cultural problems.

It establishes the working environment in which research is conducted for the academic units of the UAQ, facilitates the integration of projects in social sciences, exact sciences, art, and culture, and fosters participation in institutional events that promote interdisciplinary collaboration. Although new spaces have been created to facilitate university students presenting and funding their projects, obstacles still exist that hinder their development. Therefore, improving projects, strengthening collaborative networks between disciplines, and sharing ideas among them are fundamental to maximizing the impact of the proposals.

When different disciplines are integrated, active learning is facilitated, in which students are no longer passive recipients of information but active agents in their educational experience. This allows them to incorporate their knowledge into new proposals, connect with other members of the university community, and establish connections that strengthen their analytical, critical, and research skills. This raises the following question: What are the

challenges, benefits, and strategies for facilitating collaboration among members of the UAQ community in the design of projects that incorporate different disciplines?

This work was applied in nature; a mixed-methods and exploratory-descriptive approach allowed for the analysis of interdisciplinary dynamics expressed in collaborative projects. Given the study's focus on the perceptions of the participants, it is humanistic in character. Fieldwork was conducted at the Autonomous University of Querétaro. Surveys were administered to 70 students from various disciplines, 25 academic collaborators on interdisciplinary projects, and 15 artists and creatives who have collaborated or are currently collaborating on project initiatives. In addition, 10 semi-structured interviews were conducted with employers at the institution, from both the public and private sectors.

The research was carried out in three stages: the first consisted of conducting a census of participation in the UAQ's internal calls for proposals. This involved gathering information on the degree of involvement of student and faculty communities in the various calls for proposals.

The creativity of interdisciplinary projects is facilitated through the collaboration of students, teachers, artists, and social organizations in collaborative work processes, which promotes innovation.

It was concluded that collaborative work on interdisciplinary projects establishes participation in the calls for proposals.

As such, students can expect to remain engaged with the calls for proposals through creative team projects to develop creative thinking skills.

### **Identifying projects as a critical phase in the innovation of ideas**

Pérez (2022) explains that a project is a tool that enables the achievement of desirable objectives, guiding and paving the way for their development. The formulation of social projects arises from the desire to transform the reality in which we live.

Méndez (2020) argues that a project should be made up of several objectives that allow the fulfillment of the institutional axes, which, in turn, must be transversal with the values and purposes; this should contemplate the contribution of diverse fields of knowledge to achieve collaborative products in which different elements converge and are integrated, such as human, technological and material resources.

When a new student joins the University, they generally arrive with ideas and dreams they want to develop throughout their professional studies; some will take the opportunity to

participate in collaborative and interdisciplinary projects, such as those promoted by UAQ. We can mention the following:

- 1) Rector's Special Projects Fund ( **FOPER**).
- 2) Fund for the Strengthening of Research, Linkage and Extension ( **FONFIVE** ) .
- 3) Entrepreneurial Movement ( **DETONA FEST**).

These three funds FOPER, FONFIVE and DETONA FEST (FFDF) support entrepreneurship and, together, research, and have served as a springboard for students and academics who wish to position their innovative ideas through creative projects.

These calls for proposals have fostered interaction between different areas of knowledge, as participants have the opportunity to collaborate with colleagues from various disciplines, as well as with entrepreneurs from the public and private sectors of the state of Querétaro.

Involvement in these funds allows for the evaluation of the viability, relevance and, if applicable, the profitability of each and every participating project.

The identification of the project is based on the explanation of the main aspects of the problem or need, and on the proposal of possible alternative solutions or how an opportunity can be taken advantage of.

The problem is generally related to the opportunity to take advantage of a favorable situation, or the need to address a shortage of goods and services, or the inadequate or poor-quality supply of these goods, or the need to guarantee supply over a prolonged period. Therefore, the solution consists of discovering alternatives to capitalize on these opportunities, studying ways to increase production, improving the quality of goods and services already produced, or replacing infrastructure that has reached the end of its useful life. (Miranda, 2005, p. 7)

The guidelines for each of the aforementioned funds are presented in the following table, which summarizes and specifies: who publishes, the objectives, the categories in which one can participate, the requirements, and the benefits or economic incentives obtained if one is awarded funding. (**Table 1**)

It's worth noting that an analysis of these funds reveals they all share a single purpose: to promote entrepreneurship at UAQ. While FONFIVE does mention interdisciplinarity among its objectives, there's a need to further promote interdisciplinary projects in these types of calls for proposals.

**Table 1**

Support funds for creative projects at the Autonomous University of Querétaro (UAQ)

Call for applications	Who publishes it?	Goals	Categories	Requirements	Benefits
<b>FOPER</b>	Rector's Office of the UAQ	To support initiatives of our students and contribute to their training through the development of projects in different areas of knowledge.	Any	Students of High School, Higher Technical University, Associate Professional, Bachelor's and Postgraduate programs. Have a valid registration at the beginning and during the development of the project at the campuses of the High School and the Faculties on the different campuses of the UAQ. Fill out the corresponding form considering each and every one of the points indicated in the Operating Rules. They will be able to count on collaboration, internal or external to the UAQ, associated with the project that contributes to its development.	The support amount will be up to \$60,000.00 (applicable in the 2025 call for proposals) for each approved proposal. (number indefinite since It all depends on the budget that the university administration allocates to said fund)

				<p>If you are awarded FOPER funding, you must submit an interim report and a final report justifying each and every expense incurred, as well as the progress of the project.</p>	
<b>FONFIVE</b>	<p>Rector's Office, Secretariat of University Extension and Culture, Secretariat of Innovation, Research and Postgraduate Studies</p>	<p>To contribute to scientific, social and humanistic development.</p>	<p>To contribute to the scientific, social, humanistic, and technological development of the country and the state in all areas of knowledge. This includes fostering multi-, inter-, and transdisciplinary work, reducing gaps between university campuses, training young researchers, and contributing to the development and strengthening of the lines of knowledge generation and application within the educational programs, academic bodies, and collegiate groups of our university .</p>	<p>Project proposals must be submitted through an online system The project proposal must cover each and every one of the items requested in the current call for proposals. You can only participate as the responsible party in one proposal within the same call for proposals. The project manager is required to submit a partial and a final report on the dates stipulated in the call for proposals.</p>	<p>Maximum support limit for the individual modality \$120,000.00 and \$250,000.00 for the group modality. Provided that there is budget availability. The financial breakdown must specify the amount allocated for student scholarships at different educational levels: High school \$1,300.00 monthly Bachelor's and Associate's degrees \$1,500.00 monthly Specialty \$2,000.00</p>

					<p>Master's Degree \$4,000.00</p> <p>Doctorate \$6,000.00</p>
<p><b>DETONA FEST</b></p>	<p>Secretariat of Innovation, Research and Postgraduate Studies</p>	<p>To promote an entrepreneurial culture in the different areas of university development, with the aim of expanding their creative skills, through viable and feasible projects, with innovations that impact the different sectors of society, with the goal of strengthening the sustainable development of the region, through:</p> <p>-To create a space for feedback and strengthening of entrepreneurial projects that respond to strategic sectors of the national economy . participants' projects with guidance from teachers and specialists</p> <p>- Advise and build relationships with entrepreneurs, helping them solidify their</p>	<p><b>Traditional Entrepreneurship:</b> Products or services with commercial activity by entrepreneurial individuals who enter society independently (sales or distribution)</p> <p><b>Social Entrepreneurship:</b> Products or services that have as their end the improvement of the social fabric through non-profit associations, artistic companies, collectives, cultural groups, cultural managers, art patrons, etc., having as a fundamental pillar the development of societies, which with human development activities intend to have an impact on marginalized, vulnerable groups or the community in general.</p> <p><b>Technology-based entrepreneurship:</b></p>	<p>-Be over 18 years old</p> <p>-To live in the State of Querétaro</p> <p>-Be willing to take your idea to market and commit to working with any organization necessary for the development of the product or service.</p> <p>-Have an entrepreneurial team made up of a minimum of 2 people and a maximum of 5.</p> <p>Fill out and sign a letter of commitment for each member</p>	<p>The prizes for this year (2025) are as follows:</p> <p>First place: Seed capital of \$30,000.00</p> <p>Second place: Seed capital of \$20,000.00 and</p> <p>Third place: Seed capital of \$10,000.00</p> <p><b>Seed capital refers to the initial investment amount to support the start of the project .</b></p>

		business ideas to start a company -To connect students with the problems of their environment -To form collaborative links between students, small and medium-sized enterprises and specialized advisors	This refers to the creation and development of companies or projects whose main foundation is the application of technology to solve problems, improve processes, or meet needs in different areas of society.		
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Source: own elaboration based on the calls for proposals from 2024-2025.

### **Creativity as a catalyst for promoting interdisciplinary projects**

Goldberg (2019), in his book "Creativity," states that novelty and creativity are intimately intertwined because both are essential for human evolution. He also argues that creativity is a valuable attribute of the human mind due to its unique nature, which is responsible for generating something new, allowing us to explore the unexplored and formulate new proposals.

It is important to emphasize that the text also mentions the need for a broad integration of students' knowledge within education; it considers this a crucial guiding principle in the current educational system. This consolidates a comprehensive model that encompasses didactic, psychosocial, and pedagogical environments, enhancing analytical, critical, and abstract thinking skills, which in turn fosters problem-solving abilities.

A creative individual is someone who regularly solves problems or invents products in a given field and whose work is considered innovative and acceptable by recognized members of that field. Based on this definition, I have studied six men and one woman who, at the beginning of this century, were instrumental in shaping the modern consciousness of the West. Each of them (Sigmund Freud, Albert Einstein, Igor Stravinsky, Pablo Picasso, T.S. Eliot, Martha Graham, and Mahatma Gandhi) exemplifies one of the seven intelligences. (Gardner, 2001, p. 9)

Guilera (2020) asserts that creativity is a complex and multidimensional process that cannot be attributed to a single type of thought or ability; moreover, it integrates various human capacities, such as perception, cognition, and sensitivity, to generate meaningful

proposals. According to Zambrano Yalama (2019a), creativity is an essential competency in university education and has been promoted by international organizations, such as the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Cárdenas (2019) points out that in the last decade educational institutions have incorporated into their teaching strategies the promotion of creativity through assessable projects that contribute to the training of students at all educational levels.

One of the most important qualities to consider when working on creative thinking is the ability to elaborate, which consists of enriching and proposing new ideas or adding new elements that generate a transformation of what already exists. (Zambrano Yalama, 2019)

Every human being possesses capacities and skills that can be enhanced upon entering a profession. Gardner (2001), in his book *Frames of Mind*, emphasizes the diversity of thinking styles and types. According to the classification he refers to, he argues that every human being has the capacity to develop different intelligences:

- A) Linguistic intelligence
- B) Musical
- C) Logical-mathematical
- D) Kinesthetic-corporal
- E) Space
- F) Intrapersonal
- G) Interpersonal,
- H) Naturalist

The most recent:

- I) Moral intelligence, which refers to the discernment that some people may have about good and evil in human coexistence and
- J) Existential intelligence: refers to the essence of the human being.

This means that, evidently, not all human beings develop all the intelligences that Gardner describes, because educational systems classify learning and teaching strategies into exact sciences and social sciences or humanities.

“Creativity is an essential element not only of spiritual life, but also of the material and economic life of societies and individuals” (UNESCO, 2021, para. 1) .

## **Interdisciplinarity and collaborative work in universities**

Interdisciplinarity involves the connection and collaboration between diverse sciences, professions, and specialties with the purpose of achieving unity in knowledge and curricula. Its integration allows for a more effective approach to the complex problems of society. (Uribe, 2013, p. 71)

Llorente-Echeverría et al. (2022) state that higher education and society are eager to implement actions that significantly impact a particular sector; therefore, they suggest promoting new educational methodologies that motivate and encourage student communities to carry out interdisciplinary projects that thrive outside the institution and address real problems in any area of knowledge.

“Interdisciplinarity is presented as a new perspective on knowledge” (Olivares et al. 2023, p. 112). In the field of design, this means being able to collaborate with related areas such as:

1. Architecture
2. Interior design
3. Graphic design
4. Industrial design
5. Hypermedia design and communication

This collaboration allows for the harmonization of diverse aspects and knowledge to address an institutional, business, or social problem that involves more than one area and that allows for the realization of a creative idea, derived from something tangible, that opens up the critical and analytical thinking of the students.

Collaborative learning offers several significant advantages for both students and the educational process as a whole. Through coordinated actions, students must analyze information, evaluate arguments, and make informed decisions.

Teamwork and collaboration foster effective communication, conflict resolution, negotiation, and cooperation skills. "Through this, students become active participants in their own learning process, promoting active learning, which also fosters critical thinking and problem-solving" (Olivares et al. 2023, p. 112).

López et al. (2021) interpret it as a socio-formative approach, which consists of promoting inclusion, turning it into a model that promotes the integral development of the student to guide him in the analysis and resolution of problems.

## Convergence and interdisciplinarity in science, art, and culture

In relation to two or more parts of the same body of knowledge, the affinity between areas of knowledge defines two or more lines or paths that converge at a common endpoint (RAE, 2024). This idea goes beyond geometry and transcends mathematics, science, technology, communication, and other disciplines, in which there has been a convergence around a common objective.

Rodríguez Acevedo (1998) argues that problem-solving is how wisdom is constructed. Scientific and technological knowledge, which is based on and represents how the environment can be understood and changed, originates in theoretical and practical knowledge of the environment and provides models for responses from this perspective.

Collaboration can bring together diverse ideas and programs to benefit specific sectors of society, as well as public or private organizations and higher education institutions. This convergence allows for the generation or recreation of new proposals, and students from various fields can join together, drawing insights from each perspective.

To imagine and build a school of thought, then, is to flee from regulation and decree. It is an avenue for thought, visualization, analysis, and interpretation of reality within new paradigms, challenging conventions, stepping outside the norm, trying new things, and ultimately generating unexpected results (Pérez Díaz, 2017, p. 29).

"Part of the sense of cooperation arises among people who work to counteract a harsh reality that many professionals face today and who have believed in teamwork as a way to address work contingencies" (Pérez and Hernández, 2019, p. 375).

In academia, many universities encourage students to develop their projects through social, institutional, or organizational entrepreneurship initiatives. According to Sáenz and López (2015), individuals involved in social entrepreneurship projects are adept at identifying needs, anticipating problems, and seizing opportunities to address them, provided they have creative and innovative projects.

Hernández Arteaga et al. (2018) point out that higher education has fostered creative projects to integrate research, delivery, and education. These projects have created interdisciplinary learning communities at the university level; they have developed, as they did, collaborative societies in which the potential arises to carry out interdisciplinary projects, share ideas and experiences, and promote social and institutional transformation, among other activities.

As soon as the concepts of project, creativity, innovation, interdisciplinarity, and convergence are defined, the points of convergence between the social sciences, the exact sciences, art, and culture can be identified. Society is a field of study that encompasses human beings and their world. These are processes that shape collective life. These sciences look beyond social structures; they consider human relationships and the complexities of human behavior, according to Plaza (2014).

In this sense, the theory of multiple intelligences is a strange case: it has been adopted before its use, in the rarest way among academic practices (Macías, 2002, p. 31).

Exact sciences, on the other hand, are the language of mathematics and technical principles, which are applied to the former in areas such as engineering, physics, chemistry and mathematics, and whose objective is not focused on scientific progress but on innovative science and technology (Lei 2008; Purnell 2013).

Basulto-González (2021) argues that the science curriculum should develop skills to navigate a technology-dependent world, move beyond encyclopedic knowledge, and engage with other disciplines. University student groups also bring together diverse profiles with similarities and differences in interests and skills, depending on the students' chosen career paths, allowing engagement and collaboration to take root and joint projects to develop. In the case of engineering, the curriculum should promote logical-mathematical thinking skills.

“An electronic engineering course is not the same as a mathematics course oriented towards management in terms of its teaching structure” (Sierra-Polanco, 2019, p. 53). Interdisciplinary, Integrative, and Interactive Projects (IIPs) allow students to examine the historical causes of problems, recognize their roles in society, and understand current challenges.

Capote León (2016) insists that engineering is increasingly close to solving practical problems; therefore, it requires an interdisciplinary, holistic, empirical, social and humanistic education.

Culture, in all human activities, exists as art and in collective endeavors. Its constant evolution allows for the generation of creative concepts that address current problems. The key to progress is people's commitment to designing sustainable policies and actions. It is the responsibility of professionals and the generations currently being educated in classrooms to identify workplace and community challenges.

Solid cultural projects with long-term impact generate a great diversity of goods, services and products, offering cultural goods subject to the laws of supply and demand of

the economy, which means that they contribute to the growth and development of the country, boosting employment and the economy while benefiting society (Pantoja, 2023, p. 62).

The return on social, economic, educational, and individual investment is generated through the dissemination of creative ideas in various sectors. There are still many cultural products: simple things, technology, and objects designed to improve the quality of life. Both the construction of a master builder and the skyscraper of an architect are examples of human intelligence (Macías, 2002, p. 34).

Art, conceived as human creative production, allows the expression of ideas across diverse fields (Taranilla de la Vega, 2019). In recent years, there has been an expansion of this research in the arts, moving away from a focus on traditional art histories to the point of incorporating perspectives from the social sciences that address processes affecting what is seen and done at a social level.

As Serón (2019) points out, the aesthetic and visual value of applying the Science, Technology and Society (STS) framework is significant because the approach promotes motivation, critical discourse and interdisciplinary analysis of the technoscientific phenomenon.

As mentioned earlier, many universities are currently incorporating the implementation of interdisciplinary creative projects into their educational programs.

The Autonomous University of Querétaro (UAQ) is working to require all academic units to integrate project management into their educational plans and, as part of a teaching strategy, each of these units holds its own entrepreneurship fairs, allowing students to present a prototype of their projects.

## Methodology

This research was applied in nature and employed a mixed-methods approach with an exploratory-descriptive scope. Given the need to understand the participants' perceptions of the work, this approach was adopted, considering that the study analyzes interdisciplinary patterns of participation in institutional calls for proposals.

Qualitative and quantitative methods were combined using structured surveys and semi-structured interviews to gather information about participants' experiences in interdisciplinary projects.

The sampling was intentional and non-probabilistic, with the objective of selecting participants with direct experience in creative and interdisciplinary projects developed at the Autonomous University of Querétaro.

The inclusion criteria were: having actively participated in at least one interdisciplinary project in the last 2 years, belonging to the institution, and being available to answer the survey or interview. Participants without experience in interdisciplinary projects or with less than one month's presence were excluded, as well as those who did not agree to participate in the study.

The sample consisted of 70 students from different faculties and disciplines, 25 professors with experience in interdisciplinary projects at the university, and 15 artists and creatives involved in university initiatives. In addition, 10 semi-structured interviews were conducted with employers from the public and private sectors affiliated with the UAQ, selected for their direct involvement in interdisciplinary projects and their knowledge of the impact of these projects in the workplace.

Data collection was designed in three phases. Initially, the projects registered in the 2024 institutional calls for proposals were analyzed, examining their scope and level of involvement.

The second phase consisted of analyzing the forms of disciplinary integration present in these projects, considering criteria such as collaboration between areas, the nature of the activities, and the degree of methodological convergence.

Finally, a stage was developed to propose strategies to improve interdisciplinary collaboration, based on the data collected and the areas of opportunity identified.

For the analysis of quantitative data, descriptive statistics were applied to identify patterns in intervention and project design. Qualitative data were coded thematically to identify relevant trends, perceptions, and experiences that would allow for an understanding of the interdisciplinary phenomenon.

The combination of both approaches provides a broad and multidimensional view of interdisciplinary collaboration at UAQ today.

## Results

The results of this research highlight the structural challenges facing the Autonomous University of Querétaro in its consolidation process. This indicates a marked interest in creative and collaborative projects and greater student engagement, which is significant in

other fields. However, this trend has not been distributed equitably among the academic units, which aligns with the findings of Llorente-Echeverría et al. (2022).

There is room to strengthen institutional strategies that foster interdisciplinarity. Furthermore, the results demonstrate that students and academics, as well as artists and employers, interact so extensively that they produce educational and professional benefits, and this is where critical, creative, and problem-solving skills come into play. This aligns with the argument made by Olivares et al. (2023), who assert that collaborative learning also promotes informed decision-making and innovative solutions. However, obstacles remain in communication between faculties, the absence of institutional norms, and the continuity of projects after the conclusion of calls for proposals.

This positive view of creativity as a key element of interdisciplinary projects is also relevant. Participants realize that integrating knowledge from the social sciences, exact sciences, art, and culture expands the possibilities for innovation and strengthens the social relevance of the proposals. In this sense, consistent with Goldberg (2019) and Zambrano Yalama (2019), creativity is a multidimensional process that can be strengthened by combining diverse cognitive and expressive abilities.

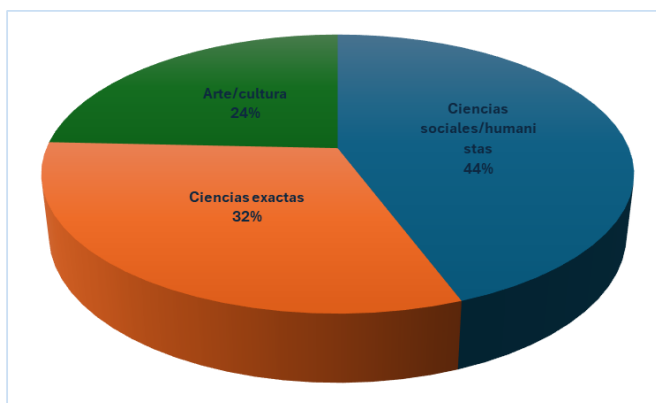
Finally, interviews with representatives from the public and private sectors indicate interest in working with the university, but clearer methods for communication, monitoring, and project evaluation are needed. This aligns with the point emphasized by Hernández Arteaga et al. (2018): organizational structures that promote continuity and impact in initiatives are crucial for consolidating interdisciplinary learning communities. Overall, these results reaffirm that UAQ has substantial potential to strengthen an interdisciplinary culture, but it is necessary to refine the organization's approach to articulation, expand collaborative spaces, and ensure the continuity of projects beyond annual calls for proposals.

Based on the data obtained from the surveys applied to 70 students and 25 professors involved in the projects registered in the three calls and benefited from the FFDF, the contribution of the areas of knowledge of the UAQ was identified.

As can be seen in **Figure 1**, the community of students in social sciences and humanities programs has a greater presence in the UAQ calls for applications, with 44%; the exact sciences are in second place, with 32%; while the arts and culture area represents 24%.

**Figure 1**

Areas of student participation in the FFDF calls of the UAQ

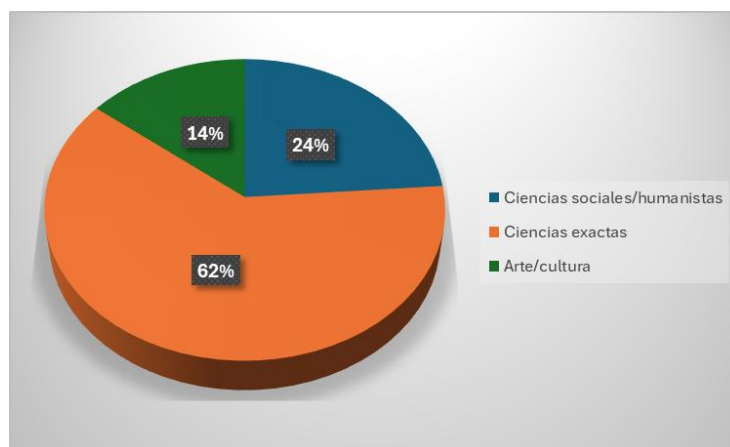


Source: own elaboration, based on the survey (2024).

Regarding the involvement of teachers, more than half of the respondents are within the area of exact sciences (62%); secondly, social sciences and humanities; and lastly, the area of arts and culture.

**Figure 2**

Areas of participation of the teaching staff in the FFDF calls of the UAQ



Source: own elaboration, based on the survey (2024).

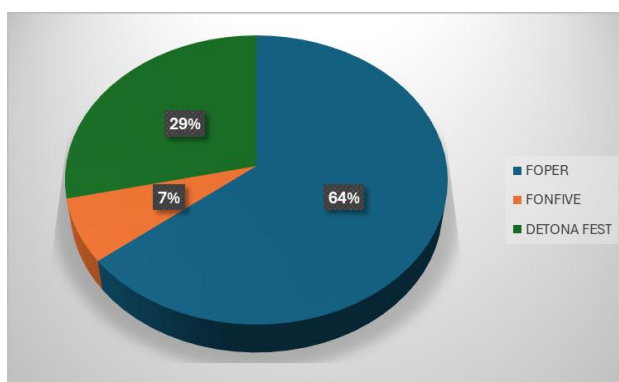
A comparative analysis reveals clear differences in the disciplinary distribution between the student body and the faculty. Based on the data shown in **Figure 1**, 44% of students come from social sciences and humanities, 32% from exact sciences, and 24% from arts and culture. Conversely, faculty participation follows the opposite pattern: over 62% of

respondents are from the field of exact sciences, followed by social sciences and humanities, and then arts and culture, as shown in **Figure 2**. This distinction in the disciplinary composition of students and faculty points to an interesting phenomenon for the study of interdisciplinary work, in which the predominance of student populations from the social sciences and humanities coexists with pedagogical leadership centered on the exact sciences.

Based on feedback from the university community, it is essential to consider their suggestions and incorporate new methodologies into all innovation projects across the various degree programs offered by UAQ. Figure 3 shows the level of participation in the different calls for proposals. Students participated most in FOPER and DETONA FEST, with 64% and 29% participation, respectively.

**Figure 3**

Degree of student participation in the FFDF calls of the UAQ

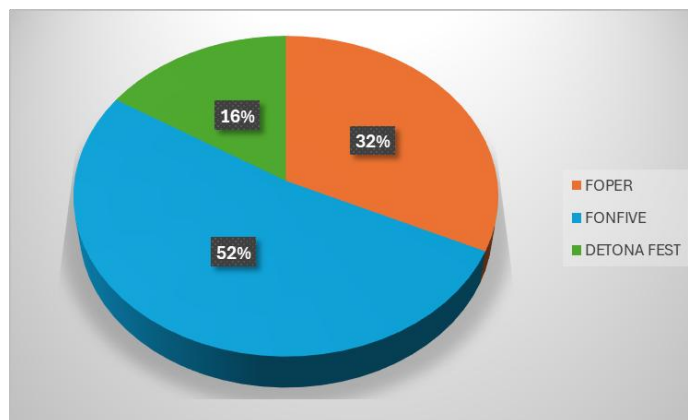


Source: own elaboration, based on the survey (2024).

The teaching staff participating in FONFIVE reaches 52%; which represents more than half of the collaboration.

**Figure 4**

Degree of participation of the teaching staff in the FFDF calls of the UAQ



Source: own elaboration, based on the survey (2024).

Based on a comparative interpretation of the participants' responses, it can be said that the FOPER call for proposals is primarily geared toward the student community; the survey results, therefore, reflect a high percentage of student participation. Similarly, the FONFIVE call for proposals focuses mainly on faculty, allowing for the collaboration of students who do not necessarily need to have a scholarship, as well as the inclusion of other academics as collaborators.

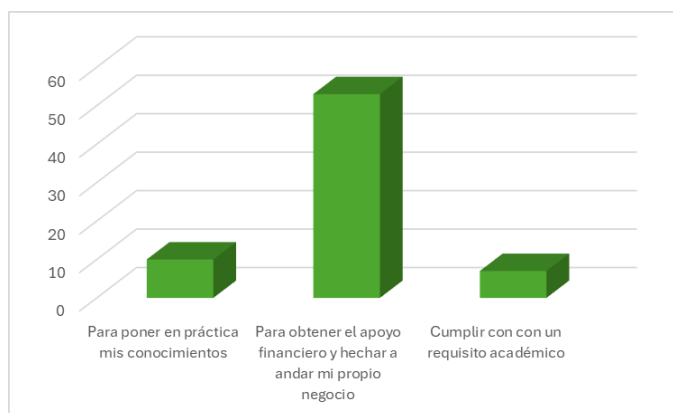
Eighty percent of students report participating in the call for proposals to obtain financial support and launch their own project, 13% to put their knowledge into practice, and 7% to fulfill the requirements of one or more subjects. **(Figure 5)**

Some of the respondents state that many students report investing a considerable proportion of their resources in the purchase of materials required by their chosen profession; therefore, when they are assigned a project, they consider obtaining the financial resources to cover the project's material costs, but they also justify the travel expenses required if they are working as a team.

Regarding the professors' perspective, they say they would like university students to be motivated to participate in order to acquire more knowledge about developing projects in their area of study, but they understand that some are motivated by the financial resources they will receive.

**Figure 5**

Aspects that motivate UAQ students to participate in its calls for proposals

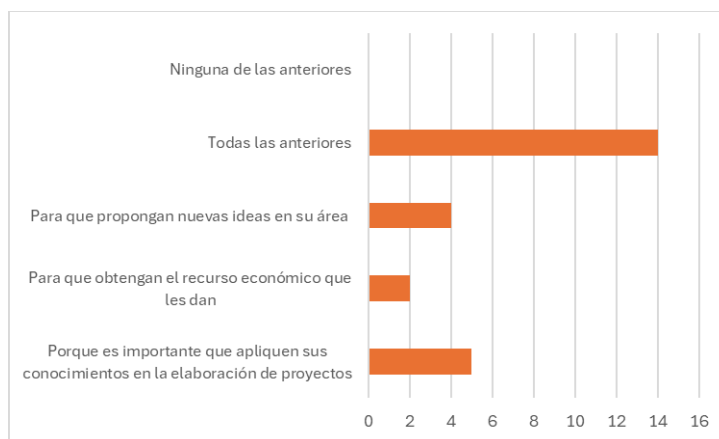


Source: own elaboration, based on the survey (2024).

More than 50% of the advising teachers believe that the motivation should be to gain more knowledge in their area, in addition to the financial fund they are given, because it is important that they apply their knowledge and skills in the formulation of innovative projects.

**Figure 6**

Aspects that should motivate UAQ students to participate in its calls for proposals, according to the faculty



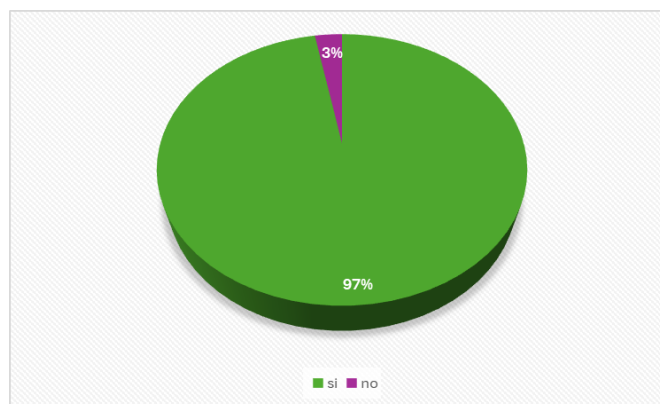
Source: own elaboration, based on the survey (2024).

While 97% of students report that the guidelines for the calls for proposals are being followed, faculty members do not feel that everyone is clear on them. These differences may be attributed to the roles, responsibilities, and expectations of each group within the interdisciplinary projects.

For students, the guidelines may seem accessible because they cover basic operational requirements—registration, project format, dates, report submission—that reflect their level of experience and the formative nature of calls such as FOPER.

**Figure 7**

Clear guidelines in the FFDF call for applications, according to the students' perception



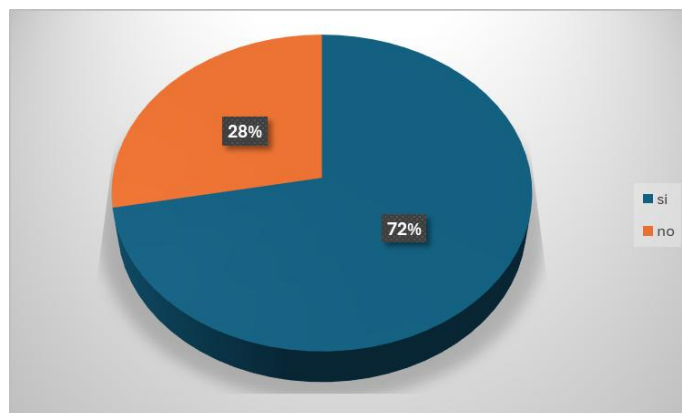
Source: own elaboration, based on the survey (2024).

Faculty members believe they face greater methodological and administrative demands, especially in a grant program like FONFIVE, which requires affiliation with research lines, a solid academic justification, technical reports, and consistency with academic bodies. This, by its very nature, generates a more critical perception of the transparency of the regulations. Administrative issues also present unique challenges for each group.

Students are provided with sufficient institutional support to meet the requirements, but faculty are forced to assume full responsibility for project management, budgeting, and reporting, which overburdens them and leaves them with the impression that the guidelines are ambiguous or insufficient. Overall, we found that the clarity with which the guidelines are interpreted is determined not only by the specific document in question, but also by the role and type of call for proposals each stakeholder is involved in, the responsibility they assume for compliance, and the type of communication they receive.

**Figure 8**

Clear guidelines in the FFDF call for applications, according to the perception of the teaching staff



Source: own elaboration, based on the survey (2024).

An exploration of perceptions regarding the clarity of instructions in institutional calls for proposals reveals a clear contrast between students and faculty. While 97 percent of students say the guidelines are well-written and readily available, faculty do not share this view. The reason for this disparity lies in the different tasks and roles assigned to the two groups in interdisciplinary projects.

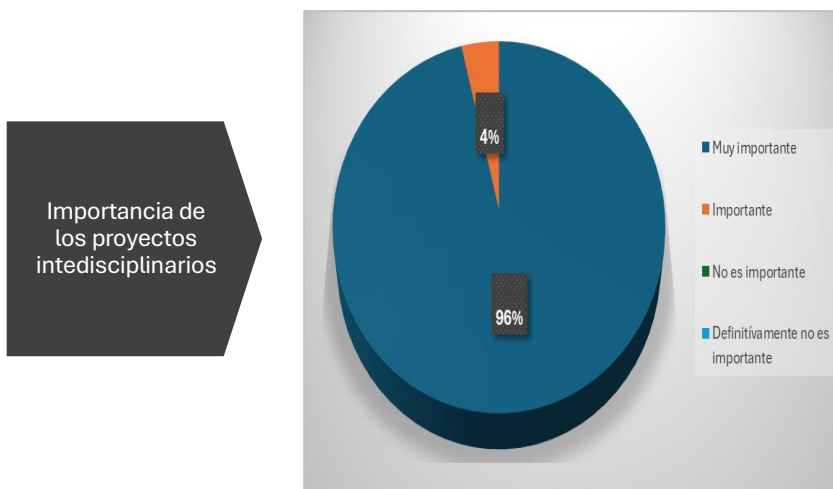
The regulations for students focus on basic operational aspects, such as registration, project format, dates and report submission, elements in accordance with their level of experience and the formative nature of some calls, such as FOPER.

Meanwhile, for faculty, these must be more sophisticated methodological and administrative requirements, especially in calls for proposals like FONFIVE, which demand commitment to research lines, solid academic justifications, the preparation of technical reports, and consistency with academic structures, giving the impression that the regulations are highly secretive. Furthermore, the complete management of the project, the budget, and accountability falls largely on the faculty, thus intensifying the administrative effort and further fueling the perception that the guidelines are unclear or inadequate.

Furthermore, how important do students consider interdisciplinary projects? 96% of students consider working on collaborative, interdisciplinary projects extremely important.

**Figure 9**

*The importance of implementing interdisciplinary projects at UAQ*

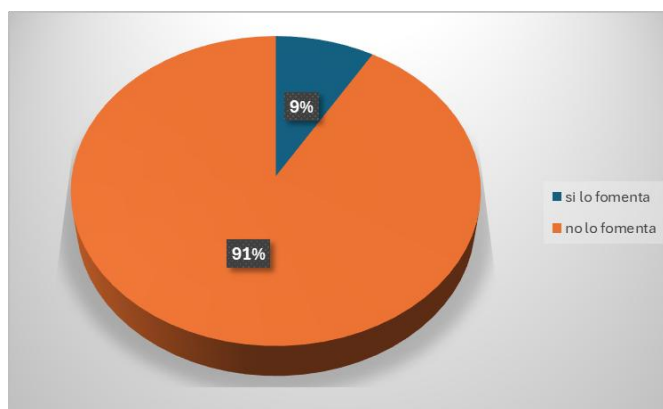


Source: own elaboration, based on the survey (2024).

Some of the participants in the three calls indicate that they agree that interdisciplinary collaborative work is encouraged in terms of classroom classes, although its implementation varies among teachers, some more than others (**Figures 10 and 11**), but in the calls especially of FOPER it is emphasized that they invite other university students to participate with them in the project, although a quarter of the participating teachers consider that it is not encouraged.

**Figure 10**

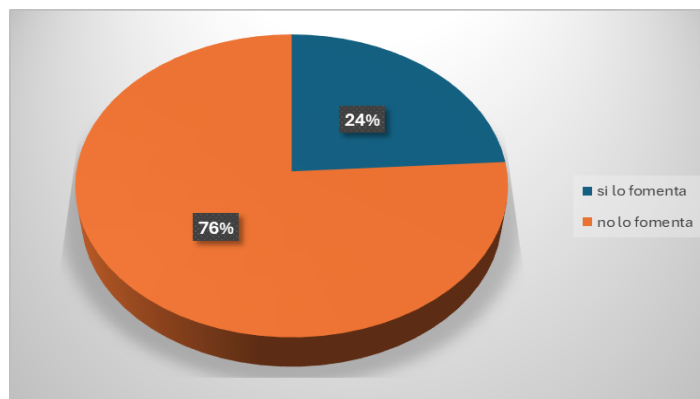
Promoting interdisciplinary collaborative work according to student opinion



Source: own elaboration, based on the survey (2024).

**Figure 11**

Promoting interdisciplinary collaborative work according to the opinion of the teaching staff



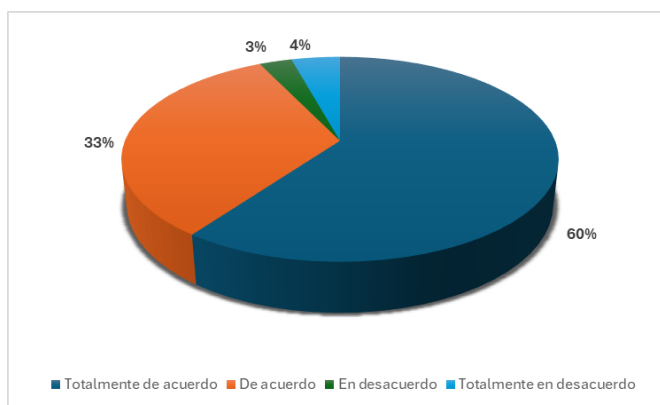
Source: own elaboration, based on the survey (2024).

When the FOPER student community and faculty were asked if they agreed with implementing interdisciplinary collaborative work between the exact sciences, social sciences, art, and culture in the calls for proposals, 87% strongly agreed, stating that it would be a way to foster coexistence and exchange of ideas and disciplinary perspectives. (**Figure 12**)

Regarding this point, several participants mentioned that it is sometimes difficult to coordinate with colleagues from other academic units, which contributes to differences in disciplinary profiles and communication styles. They (administration students) stated that it has been very easy for them to work with the artists from the Faculty of Arts, Engineering, and Psychology, but those with whom they have had the most communication problems are those from Political Science, and the historians and philosophers from the Faculty of Philosophy. For this reason, they agree that these inter-faculty collaborative projects should be encouraged.

**Figure 12**

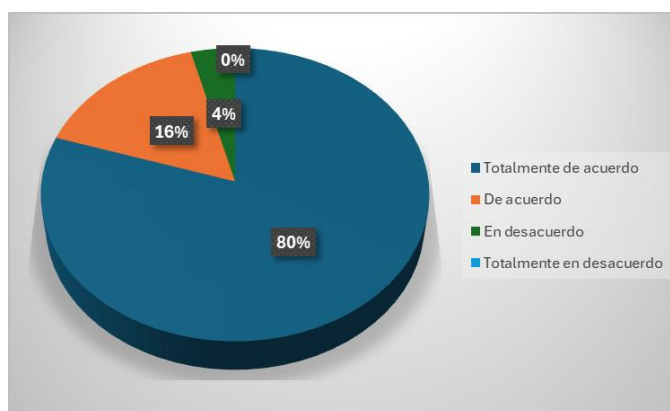
Level of interest of the teaching staff in the implementation of collaborative and interdisciplinary projects at UAQ



Source: own elaboration, based on the survey (2024).

**Figure 13**

Level of interest of the teaching staff in the implementation of collaborative and interdisciplinary projects at UAQ



Source: own elaboration, based on the survey (2024).

Comparative evaluation reveals that professors have a higher perceived satisfaction with the achievement of the graduation profile, while students perceive considerable success, albeit with a sense of conservatism. This discrepancy is typical in curriculum evaluation, where professors tend to consider the relevance and coherence of the educational framework, while students evaluate from a basic level, both in the classroom and in practice.

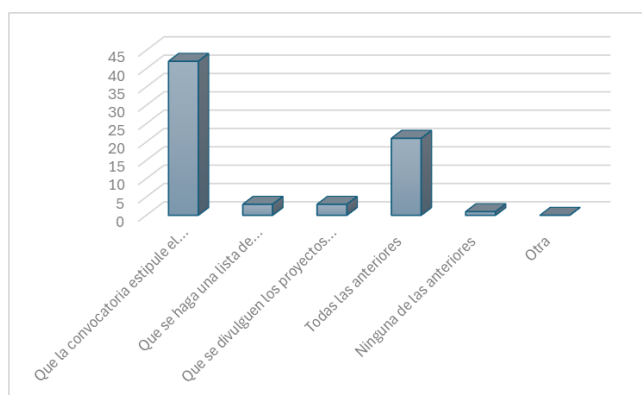
Both students and faculty believe that the graduation profile is being achieved satisfactorily, but that it is not as strongly accepted by students as it is by faculty. This contrast

offers significant learning opportunities for the continuous improvement of the program, particularly in pedagogical and curricular enhancements.

Regarding fostering interdisciplinary collaboration, one of the key questions for this research work was to establish strategies to promote interdisciplinary collaboration groups in the design of their own ideas, where there is a point of affinity and creativity among UAQ students.

**Figure 14**

Student proposals to promote interdisciplinary collaborative work at UAQ



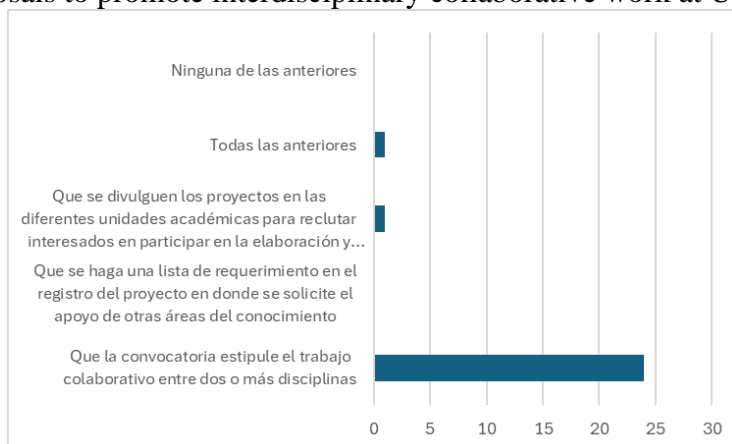
Source: own elaboration, based on the survey (2024).

For the faculty advisors from the various disciplines, a large proportion of professors and students consider the FOPER calls for proposals, which have the highest participation rates among university members, to be the most attractive, given that the administrative requirements are accessible and all educational levels at the UAQ are considered. In contrast, FONFIVE is more geared towards research professors with student collaboration and offers higher funding amounts. **(Figure 15)**

They also commented that, despite not being within the guidelines of the calls for proposals, this clause of interdisciplinary work in collaboration with other areas of knowledge—which is never lacking in the events of their faculties—is the artistic-cultural intervention, which the fellow artists of the Faculty of Arts are always willing to support with their talent in the different events that take place at the UAQ.

**Figure 15**

Professors' proposals to promote interdisciplinary collaborative work at UAQ



Source: own elaboration (2024).

Based on the comments of university students, it is relevant to consider the implementation of new methodologies in all innovation projects of any of the careers offered by UAQ.

### Discussion

The complexity of interdisciplinary projects participating in the FFDF calls for proposals at the Autonomous University of Querétaro (UAQ) lies in the fact that, in general, they have been geared toward fostering entrepreneurship and research. However, this emphasis has led to the underestimation of creative interdisciplinary projects that bring together diverse perspectives and innovative or regenerative ideas about what already exists. According to Suárez et al. (2018, p. XX), "interdisciplinarity remains a challenge, and trying to incorporate the entire range of theoretical discussion on the subject into a specific action proposal is an unrealistic goal."

Examined within the context of the asymmetry in participation between interfaculty collaborations and academic internships, there appears to be evidence of the need to adapt or establish guidelines that promote more equitable and effective compliance. In fact, although the FONFIVE call for proposals establishes multidisciplinary, interdisciplinary, and transdisciplinary work as its foundation, it is precisely this call, with the least student involvement, that stifles the development of sustainable synergies among the stakeholders.

More than 90% of participants recognized the role of collaboration in these calls and 87% supported its application in academic units, although the absence of meaningful interaction between faculties hinders the growth of future innovative projects.

From a teaching perspective, rather than a student one, it is noted that the calls for proposals do not adequately reflect inclusion and collaborative work. Data shows that most proposals originate from the social sciences, with arts and culture spaces being very limited and barely integrated into these initiatives. Although participation in the humanities, arts, and culture is low, studies have shown that participants' motivation is primarily financial.

There is potential for improvement, which will also strengthen the academic aspect and, furthermore, increase the quality and diversity of participation in the calls for proposals. The findings reveal that, through successful integration of the exact sciences, social sciences, arts, and culture, new knowledge can be obtained that exerts a strong influence in the social, educational, cultural, and environmental spheres.

The results of these findings suggest proposing an innovative methodology based on research and creation, along with the integration of collaborative and interdisciplinary work into the guidelines. This methodology will allow for a participatory learning process, which aligns with the institution's needs. It is also recommended that the call for proposals guidelines be reformulated to encourage two or more disciplines to make their own contributions, through advising and mentoring approaches that support the learning process from the outset.

Finally, the dissemination of successful results based on models to replicate these interdisciplinary actions should encourage others to expand the replication and expansion of this practice.

## Conclusions

This research identified the interdisciplinary projects registered in the various calls for proposals of the FFDF at the Autonomous University of Querétaro (UAQ) and categorized how they are integrated across different fields. Based on this data, a strategy was developed to promote collaboration among various academic disciplines. This involves proposing to the organizing committees of each call for proposals a provision in their regulations stipulating that projects must be interdisciplinary and involve at least two disciplines from different areas of knowledge.

A pilot program at the Faculty of Arts, in which students from various artistic disciplines were invited to design and implement a collaborative project, demonstrated that collaboration truly enriches the teaching and learning process and makes the results relevant beyond the classroom. Therefore, it is recommended that interaction among the faculties of the UAQ be improved so that students can participate in opportunities that foster cooperation and creative endeavors.

It is suggested to systematize experiences that have proven to be successful, which will be important for a more critical and ethical development generation, while becoming more capable of solving the problems it faces, as determined by the data collected in this study.

As a result, recommendations are provided to the institution regarding the explicit inclusion of interdisciplinary collaborative work in its call for proposals guidelines and the application of research- and creation-based methodologies. Advice and support can bolster these ideas in the initial project stages to ensure they facilitate learning and development. Similarly, greater dissemination of successful outcomes is emphasized as a basis for replicable models that sustainably enhance the culture of interdisciplinary collaboration at UAQ.

These changes improve the quality of projects, but also instill in the institutional culture a valuable sense of interdisciplinarity that fosters academic development and innovation.

### **Future lines of research**

1. Analysis of the key factors that influence the success of creative and interdisciplinary projects at the Autonomous University of Querétaro.
2. Identifying the existing link between the UAQ and the private sector in Querétaro based on successful projects developed at the institution.
3. Longitudinal study of the professional experiences of the beneficiaries of the FFDF-UAQ during the period 2024-2026.
4. Evaluation of the use of Participatory Action Research (PAR) in creative projects funded by the FFDF-UAQ.



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