

Bizkaia Tech

Future's engine | Issue 13



CONTENTS

BizkaiaTech Magazine Future's engine | Talent
Issue 13 - Summer 25

Magazine

When we have answers we must change the questions. Only like this can we innovate disruptively. Change schemes, paradigms and ways of thinking.

BizkaiaTech Magazine is the go-to magazine (filled with art) for inquisitive minds, full of good ideas, great projects and good vibes.

Born to share learning, with a disseminating spirit and the soul of an artist.

With each change of season (winter, spring, summer and autumn) we get inspired, take a deep breath and capture it by launching a new issue.

We want to be the space where anyone, wherever they come from, can find the latest news in technology, great stories, projects that we are doing, projects that are to come and how to get the best out of our land, which belongs to everyone.

And all this, **collaborating with local artists.**

Editor Lantik S.A. (Sabino Arana Etorbidea, 44, 48012 Bilbao, Bizkaia) | **D.L.** LG BI 1460-2023 | **ISSN** 3020-7371

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04 Ordinary talents, extraordinary talents

08 Talent and open, free recognition

12 Brains here, brains there

16 The pedagogy of thinking:
The pending subject of the education system

20 The tower of talent, BAT

22 How is looking for a restaurant similar to looking
for an employee?

26 To Formula 1 and beyond

30 Talent as a driver of Biscay's future

34 AI, a tool. Creation, a human act

38 Talent has no age

42 Eusko Label Olimpiads



ORDINARY TALENTS



EXTRAORDINARY TALENTS

BY BIZKAIATECH EDITORIAL TEAM / ILLUSTRATION MABEL ESTEBAN

When we think of the word talent, our minds are flooded with images of people like Usain Bolt, Aretha Franklin, Albert Einstein, Leo Messi, Simone Biles, or Marie Curie. People who, in their respective fields, have achieved things that “ordinary mortals” would never even imagine reaching.

When we think of the word talent, however, we rarely think of those who stay up late at night studying to pass a civil service exam, or those who wake up at 4 a.m. to bake bread, those who open a small business, or those who fill their homes and their friends’ homes with colorful paintings and portraits. One of the definitions of talent is “an intelligent person or one fit for a specific occupation.” And here’s the thing: it can be any person, and of course, any occupation.

“EVERYBODY HAS TALENT, IT’S JUST A MATTER OF MOVING AROUND UNTIL YOU’VE DISCOVERED WHAT IT IS”

But do we all have talent? The short answer is yes; you just need to look inward. George Lucas, one of the most acclaimed film directors in the world, put it clearly: “Everybody has talent, it’s just a matter of moving around until you’ve

discovered what it is.” Sometimes you don’t even need to move, and that’s because sometimes, talent is innate: you’re born with it and it develops over time, showing up in a natural way. Still, there’s no sure way to know if you have innate talent, because most of the time, talent comes from applied work: what we call acquired talent. Trying this, trying that, figuring out what we like and what we don’t, helps us see not only what we’re capable of doing well but also what we truly enjoy.

Why is it important to emphasize this? Because “ordinary mortals” also have a lot of talent. And for a territory like Biscay (and any other, for that matter), creating, developing, attracting, and retaining talent, even if it’s “small” or for a “small” task, is essential for all the people living here to have the chance at an even better life. And as always, BizkaiaTech Magazine is here to inspire, showcase, and share options so that you too can be part of this network of ordinary talents that, in reality, are extraordinary. Want to know what we’ve got in store for you this time?

IN THE FOLLOWING PAGES

In this edition of BizkaiaTech Magazine, we’ll talk about talent in many of its forms. We’ll discuss retaining young talent that is leaving, but we’ll not only focus on young people; we’ll also talk about adults or seniors who, to benefit their health (or satisfy their curiosity), decide to take up or begin learning something new at a later stage in life.

We’ll of course talk about several programs in Biscay to show that our territory is certainly not lacking in talent: we’ll highlight BAT Tower, a space where all STEAM skills come together to shine with ideas, projects, and plenty of collaboration; we’ll talk about Formula Student Bizkaia, a project by the Bilbao School of Engineering that helps young people pursue their passion for motorsport; we’ll talk about Bizkaia Talent, a program that aims to attract, connect, and retain qualified individuals in the processes of knowledge and innovation; and last but

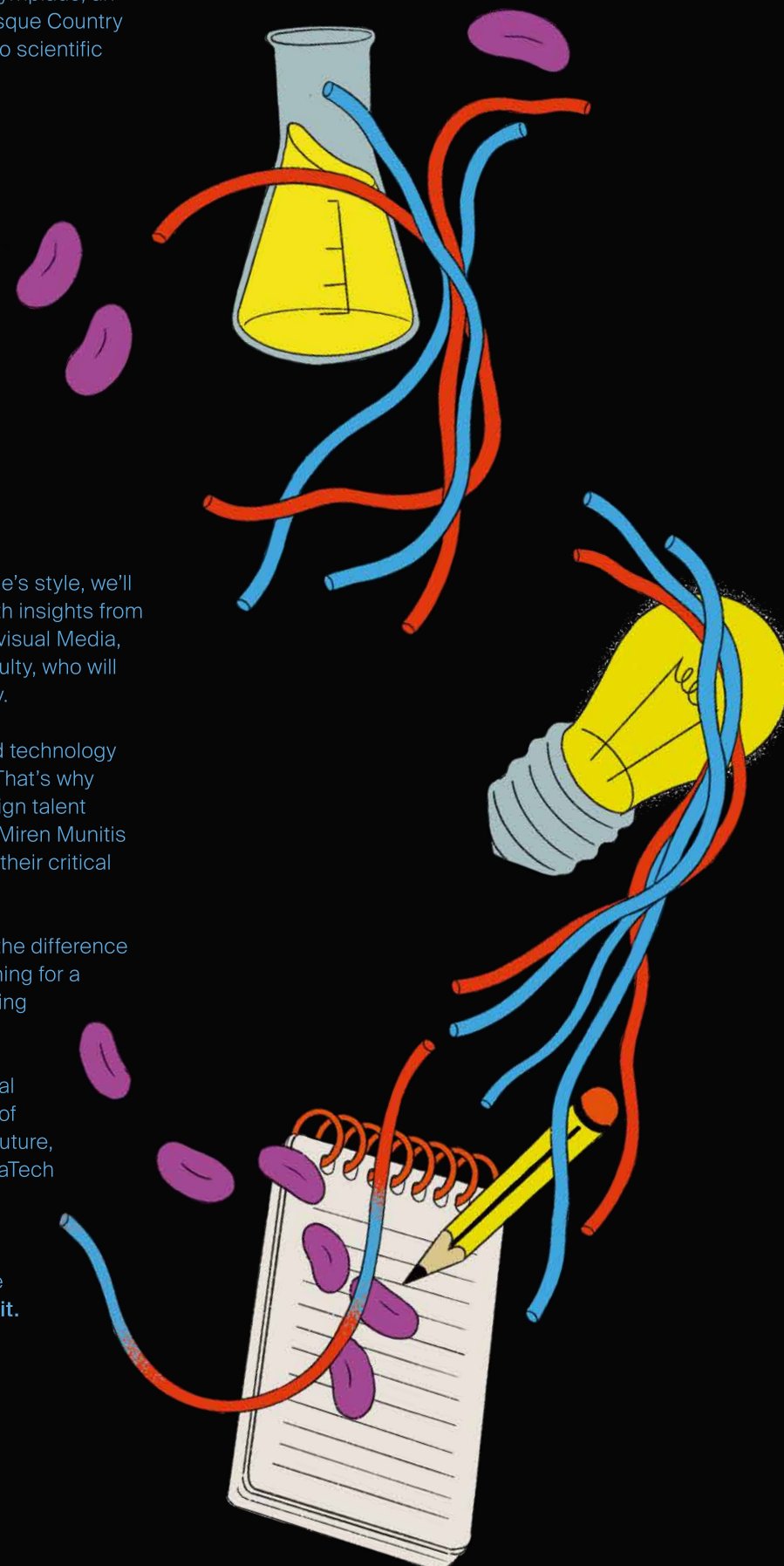
“ORDINARY MORTALS” ALSO HAVE A LOT OF TALENT

In addition, true to BizkaiaTech Magazine’s style, we’ll take a closer look at the A in STEAM with insights from Arantza Lauzirika, PhD in Art and Audiovisual Media, and Professor at the EHU Fine Arts Faculty, who will explain the role of AI in human creativity.

The human perspective on science and technology is also one of our strongest hallmarks. That’s why Mentxu Ramilo will talk to us about foreign talent and several initiatives to boost it, while Miren Munitis will focus on children and how to foster their critical thinking through an educational lens.

Finally, would you know how to answer the difference between searching for a job and searching for a restaurant on the Internet? In the following pages, you’ll find out.

So, maybe you don’t have an exceptional talent that would land you on the cover of *Time* magazine. But if you’d like, in the future, you could have a small feature in BizkaiaTech Magazine. Because showcasing local talent... well, you could say that’s our thing. And if you don’t believe us, discover it firsthand by diving into these pages... Fair warning: **you won’t regret it.**



TALENT AND OPEN, FREE RECOGNITION

BY MENTXU RAMILO ARAUJO / ILLUSTRATION IONE LARRAGO

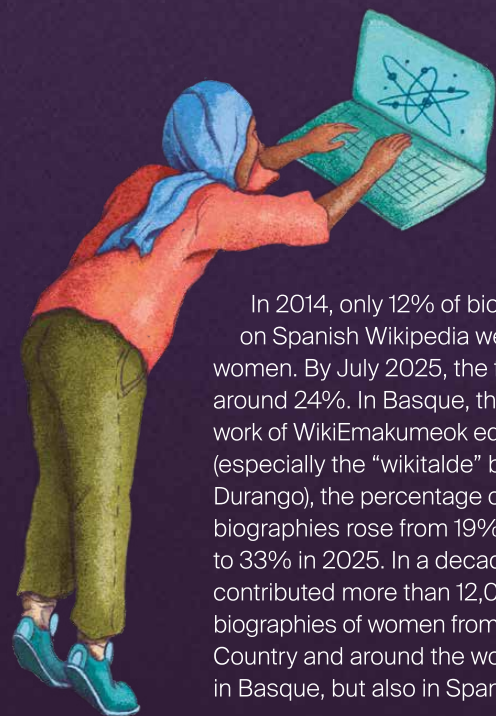
Wikimedia projects have biases because, on the one hand, those who have the resources to participate in them pay little attention to the contributions of marginalized sectors. And, on the other hand, because marginalized populations lack the necessary conditions to contribute their knowledge.



WIKIEMAKUMEOK: MAKING WOMEN'S CONTRIBUTIONS VISIBLE

In January 2015 I created my first article on Wikipedia, and it was deleted. After my initial anger, I had two options: either give up or learn. I chose to learn, and with the support of Wikimedia Spain we organized, in Vitoria-Gasteiz (November 2015), the first of many Wikimedia gatherings held over these ten years to contribute to Wikimedia projects. That was the seed of the activist project WikiEmakumeok, which now includes several groups of women editors in various Basque towns, focused on achieving a balanced presence of women and men in Wikipedia.

We still face mental barriers and physical ones



In 2014, only 12% of biographies on Spanish Wikipedia were about women. By July 2025, the figure is around 24%. In Basque, thanks to the work of WikiEmakumeok editing groups (especially the "wikitalde" based in Durango), the percentage of women's biographies rose from 19% in 2020 to 33% in 2025. In a decade, we have contributed more than 12,000 biographies of women from the Basque Country and around the world, mainly in Basque, but also in Spanish.

In 2023, thanks to Josi Sierra, we recorded a documentary narrating the genealogy of WikiEmakumeok in the Basque Country. Some staff from Zehar-Errefuxiatuekin watched the film and showed interest in the challenge posed by Marta Calvo: how could we involve racialized people and those from diverse backgrounds in editing groups?

WEAVING MUTUAL SUPPORT AND FREE KNOWLEDGE

Within the framework of the project Entretejidas/Sareginak - WikiEmakumeok, we have carried out several workshops and weekend immersions that, for me, have been transformative. In addition to creating, improving, and translating articles about women and communities on Wikipedia, we built a space of mutual support. Recognizing the life stories of women as social and cultural leaders, land defenders, artists, migrant/refugee activists, and others is also a form of symbolic reparation and resistance.

The Immigration Law affects all aspects of daily life and also the possibilities of generating free knowledge. How can you edit Wikipedia if your legal status prevents you from opening a bank account, accessing a computer, or having the time and space to learn? How can you document the history of your hometown and your role models if your very existence is considered "irregular"?

This legal and social barrier produces a representational void: what is not named or documented doesn't or doesn't seem to exist. And those who lack the time, capacity, or agency to name and document do not exist either. This limits the generation of knowledge and the visibility of contributions from populations without full citizenship rights (especially migrants/refugees who care for our children and elderly, or who work in hospitality, construction, or agriculture).

It is essential to promote redistributive policies that guarantee dignified lives for all; activate anti-rumor strategies to dismantle racist and classist stereotypes; fund digital literacy programs with an intersectional perspective for migrants, refugees, and racialized people; and support memory and documentation projects that foster self-representation of diverse communities.

We believe that mixed spaces like the labs promoted by Zehar-Errefuxiatuekin, are fundamental for meeting, listening, learning together, building

collectively, and making visible projects led by women. They are also key for accompanying each other in creating new personal and collective projects. Because talent is infinite, and knowledge grows the more it is shared.



DEMOCRATIZING THE ACCESS AND USE OF TECHNOLOGY

In the age of AI and quantum technology, as in previous technological waves, a recurring unresolved issue is the democratization of access, creation, and use of technologies to unlock other talents. We live in times of concentrated power, where technologies with incredible potential are used for surveillance and control. Will these technologies reinforce stereotypes? How can we avoid new gaps in access and use?

Committing to open, free, and distributed technologies broadens the spectrum of voices and talents to address increasingly complex problems and needs. In an eco-dependent and interdependent world, where information and knowledge flows know no borders, we still face mental barriers (beliefs and stereotypes) and physical ones (restrictions on movement).

Classism and aporophobia are barriers that limit people's potential. It is in our hands to become aware of our privileges and biases, to listen and pay attention, without paternalism, to what other human beings, like you and me, also need to build meaningful lives of their own.

Acknowledgments

To Laura Fiorucci for her virtual support over the past decade. To all the wikilaris who have accompanied me through these years, practicing #VeníVidiWiki. To Marisa Barrena and the Durango wikitalde for their great Wikimedia work. To Marta Calvo Larralde for broadening my perspective. To Wikitoki for giving me the chance to get to know the San Francisco neighborhood. To Arturo Izarzelaia and Xabier Aretxaga for their remarkable work in documenting and spreading knowledge about Bilbao's Upper Districts. To the Zehar-Errefuxiatuekin team for weaving us together. To Dora González, for being the best ambassador of the Entretejidas-WikiEmakumeok project. To Fátima Tórrez González, for helping many women regain their dignity. To Irati-Nahele Barreña and Ana González, for their contributions in improving this text. To Salima Ahmiduch El Haddouti and Umetha Chouwey Mohamed, for putting their talents at the service of others. To Jaio de la Puerta for so much shared talent.



The participation of migrant/refugee and racialized women in Wikimedia projects requires processes of support and dynamics that overcome ableism, eurocentrism, and white validation of knowledge. We are learning a lot from this process, which is a collective commitment, so that many more diverse people can contribute to generating and sharing (orally, in writing, analogically, or digitally) the sum of all human knowledge.

RECOGNIZING LOCAL AND GLOBAL TALENTS

In 2024, thanks to the Wiki Takes San Francisco project, I was able to talk with people living in this high district of Bilbao and learn part of its history, now documented on Wikipedia with over a hundred new articles in Spanish and Basque. I saw how people from other Bilbao neighborhoods were reluctant to approach the San Francisco neighborhood library to participate in our Wikimedia activities. The constructed narrative of insecurity has prevented many from discovering the richness, diversity, and talent in the neighborhood. And what we do not recognize, we can hardly value.

In the streets of San Francisco there is much wasted talent (brain waste). To sustain productive lives in the neoliberal system, in any other global north city, there are many women working 24/7 as caregivers. They are professionals with undeployed talents, carrying out essential social care functions, in exchange for a minimal salary. What if we recognized care work with dignified wages? What if, in addition, we valued these caregivers' experiences as journalists, lawyers, activists, engineers, artists, and more?

**BRAINS
HERE,
BRAINS
THERE**

BY BIZKAIATECH EDITORIAL TEAM / ILLUSTRATION PAULA GUERRERO

It doesn't matter when you turn on the TV: for years now, the news has been talking about the brain drain (sometimes referred to as "talent drain" or "human capital flight"). But what does that even mean? Brain drain is the emigration of professionals and scientists with a university education in their home country to other nations. Young people who, upon finishing university, head abroad in search of new experiences; experienced workers who move to chase more promising economic opportunities; or simply people who want a new life somewhere their work and effort are valued. Cases of all kinds. And even if it doesn't seem like it, each and every one of them is concerning.

WHY SHOULD I CARE?

You might think it's not that big a deal that everyone has the right to look for a new life. And that's true, no one's denying it. But there's a reason why the news makes such a fuss about this: because it's harmful, not just for us but for any region. While there are different types of human capital flight (for example, organizational, when a worker changes from one company to another; or industrial, when they change not just companies but industries as well), here we'll focus on geographic brain drain: the kind that happens when skilled workers leave their country or region of residence to seek better job opportunities elsewhere.

Let's first look at some of the causes behind this type of emigration:

- **The conditions offered by companies:** If workers aren't happy with the conditions offered at home, they're more likely to look abroad. Let's break it down: when it comes to wages, Spain ranks 15th among the 29 countries analyzed, with an average of €18.2 per hour (Bankinter, 2024). The top spots are taken by Luxembourg, Denmark, Norway, and Finland, with hourly wages between €39–47. If we compare the Basque Country with the rest of Spain, however, we find an average of €33,504/year, making it the best-paid autonomous community in the country (20 Minutos, 2025). Remote work is another factor people value more since COVID-19. Eurostat notes that nationally, only 7.1% of workers in Spain work from home, compared with 21.7% in Finland, 21.4% in Ireland, and 14.3% in Belgium and Switzerland. Surprising, right?

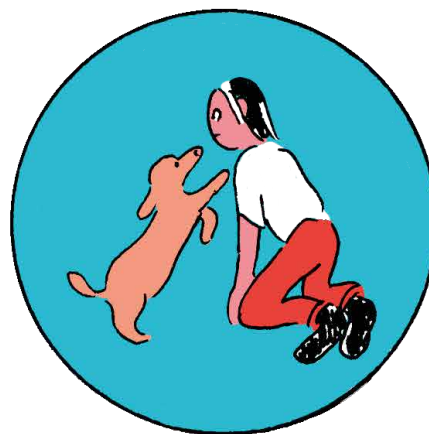
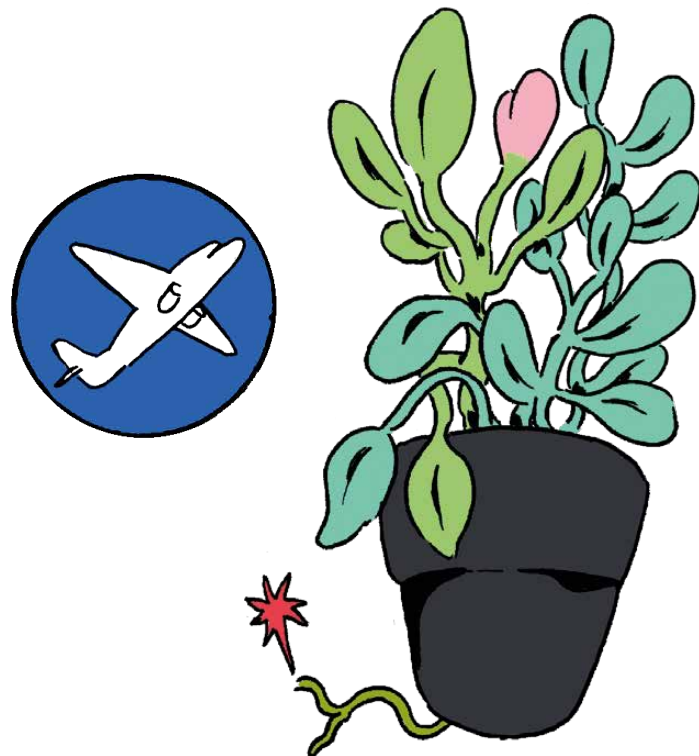
- **The economic and social situation where people live:** Housing prices, financial aid, the welfare state, unemployment or underemployment rates, and taxes are all factors people weigh when deciding where to live and work. Another key factor is investment in R&D. If researchers and scientists find better opportunities and resources abroad, allowing them to advance their careers and contribute more to their fields, they often head that way.

- **Ambition and work climate:** The drive to grow professionally, not just through promotions but through recognition and learning, is another common hurdle for talented people. Combine that with the work environment at their jobs, and the decision to move abroad can become inevitable. In fact, according to Business Insider (2024), "Spain is one of the European countries with the worst results in employee engagement, job satisfaction, and levels of anger, stress, and sadness at work."

THE MISSION TO ATTRACT, RETAIN, AND CONNECT TALENT NEVER STOPS

And as we know, every cause comes with its consequences. Here are a few that brain drain can bring:

- **Economic and social impact:** The lack of qualified talent can make companies less competitive, especially in scientific, technological, and engineering fields, which affects the local economy. What's more, when companies can't find the right profiles, they often shuffle their staff around, creating uncertainty for workers and lowering productivity. Taken together, this can worsen services in both public and private sectors, reducing quality of life.



- **Loss of investment in education:** When countries (or regions) invest in education but graduates leave afterward, that investment doesn't translate into economic growth. This can eventually push public and private institutions to cut back on education spending.

BISCAY, THE PLACE TO BE



But it's not all doom and gloom.

We live in Biscay, think about it! According to the FADSP (Federation of Associations for the Defense of Public Healthcare, 2024), the public health system (in the autonomous community) is among the best in the country. Investment in R&D is on the rise, at 2.16% of Euskadi's GDP and closing in on the EU-27

average of 2.27% in 2022 (Basque Government, 2025). Economically, Biscay has surpassed pre-COVID performance levels: "SMEs in Biscay have advanced in innovation. The business fabric is well-positioned in innovative activities, particularly product innovation. There's also strong entrepreneurship, especially innovative entrepreneurship" (Government of Biscay, 2024). The same report highlights improved



A PERIODIC SOCIOLOGICAL STUDY SHOWS THAT CITIZENS RATE QUALITY OF LIFE IN THE REGION VERY HIGHLY: 7.7 OUT OF 10

qualification and employment rates compared to 2019, as well as the increasing education levels of young people entering the workforce. On top of that, thanks to the tireless efforts of Bizkaia Talent (you'll get to know more about their work in the following pages), the mission to attract, retain, and connect talent never stops.

Overall, a periodic sociological study by the Government of Biscay (2024) shows that citizens rate quality of life in the region very highly: 7.7 out of 10. And 64% of respondents say they are very optimistic about Biscay's future.

And even though we've already given plenty of reasons to stay here, we might have forgotten the most important one: in Madrid, you'll pay €5 for a *pintxo de tortilla*, and in Norway, you won't even be able to get your hands on one. So yeah, think about it...

So, if we want the news to stop repeating itself and actually bring us something new, maybe we all need to do our part, not just skilled workers, but companies and industries too. Because we all know our region is full of people with good heads on their shoulders. And don't forget about the *pintxos*... they are quite important as well.





More than 12 years ago, I began exploring thinking, prompted by some questions that kept resonating in my head: What is thinking? How can the capacity to think be broken down? What skills or abilities should we develop to think effectively? What are the consequences of not developing thinking skills? (mental rigidity, impulsive thinking, conformism and intellectual dependence, superficiality, egocentrism, cognitive distortions and biases, or superstitious thinking, among many others). What limiting and/or empowering factors exist in the thinking process? How can we teach thinking?

In my early years as a teacher, I focused my inquiry on the very definition of thinking and the identification of different types of thinking. There are several theories and authors who study this, long lists, differing definitions and classifications. Thanks to this passionate (and endless) exploration, I discovered wonderful programs and educational resources committed to and focused on teaching how to think, such as *Philosophy for Children*, *Project Zero* (Harvard), *TBL* (Thinking Based Learning), *Visible Thinking...* And authors like Robert J. Swartz, Arthur L. Costa, David Perkins, Rebecca Reagan, Robert H. Ennis, Matthew Lipman, Ann Sharp, Bena Kallick, and Paul Ritchard, among others, became constant references and sources of inspiration in my daily practice.

I trained to become a TBL teacher and coach and also took several courses on Philosophy for children. Although these trainings were highly satisfying and interesting, I still needed a more complete, specific, and precise pedagogical program to teach my students how to think and to provide them with what education should truly offer: a deep, well-structured plan to develop, explicitly and systematically, productive and reflective thinking from an early age.



THE TEACHER AS A MIRROR

As teachers, we ask and demand students to think far more often than we actually teach them to. Every classroom activity requires thinking, but who takes responsibility for teaching them how to think effectively? For teaching them which thinking skill or ability to use in each context? Of course, to avoid teacher hypocrisy, it would be dishonest to teach thinking if we ourselves, as educators, are not fully committed to training and improving our own thinking capacity. We must embody virtues related to thinking dispositions, strategies, and skills. We must explicitly share our thinking processes with students (the strengths and the weaknesses) with the closeness, transparency, and honesty they deserve. We must reflect on our own learning and thinking processes alongside them, becoming a mirror in which they can see themselves reflected. From there, through self-assessment and constant metacognitive reflection (on the effectiveness of our mental processes), we can model and guide our students toward deeper and more effective thinking processes.

We must reflect on our own learning and thinking processes alongside them, becoming a mirror in which they can see themselves reflected

To raise awareness among those interested in this field and to share resources and personalized training, my colleague Viridiana Barbán (one of the key references in Thinking-Based Learning, TBL) and I founded OneTwoThink and the framework of the Pedagogy of Thinking. This project was born about six years ago, with the goal of asserting the importance and necessity of teaching and learning to think, to ensure that future generations are not only capable of understanding and consuming knowledge, but above all, of constructing it. And furthermore, that they do so in a committed, collaborative, and responsible way, contributing to the improvement of both the world around them and their own.



THE METHOD

The pedagogy of thinking is grounded in developing thinking dispositions and skills through their direct teaching and their integration into the official curriculum via meaningful and efficient methodological and didactic strategies. By thinking dispositions and skills we mean such abilities as analysis, questioning and critical thinking, creativity, philosophical-scientific inquiry, entrepreneurial thinking, ethics, collaboration, effective communication, and above all, metacognitive reflection. The foundation of pedagogy of thinking is built on three essential pillars: BEING, KNOWING, and KNOWING HOW TO DO.

Over these years, we have trained more than 600 teachers from different countries and created a complete program with specific teaching materials, such as the student book *The Adventure of Learning to Think* (*La aventura de aprender a pensar*), the teacher book *The Challenge of Teaching to Think* (*El reto de enseñar a pensar*), and a set of card decks designed to train each thinking skill.

We are enormously proud to see how more and more schools are embracing the pedagogy of thinking and implementing the full program in their classrooms, thanks to the teaching resources and training we provide.

GAMIFICATION FOR LEARNING

Students learn to think thanks to eight characters we have designed. In the book, each represents an intellectual disposition and is intended to model and guide awareness and the development of certain tendencies toward effective, reflective, and conscious thinking. Each character is assigned a particular approach, disposition, and defining traits: What represents and stimulates them? What do students connect with? What capacities do they develop?

For example, one of the characters, Sophis, represents philosophical thinking and curiosity. They respond with wonder and interest to the world around us, formulate relevant, creative, and transformative philosophical and scientific questions; they investigate and inquire into different subjects and disciplines, showing openness to new knowledge and lifelong learning.



Another example is Logos, who represents the virtue of logical thinking and has a strong capacity for analysis. They show ambition and precision in seeking information and organizing it in a logical and reasoned way. They pursue deep, conceptual understanding of facts and ideas; and to do so, they identify components, similarities and differences, causes, consequences, patterns, relationships, and implications. They explore multiple perspectives.

Teaching experience over the years shows us how students develop their problem-solving abilities, creativity and divergent thinking, commitment to inquiry and lifelong learning, decision-making, and the depth with which they approach any topic, whether daily or disciplinary. And all of this through collaboration, reflection, and ethical commitment, recognizing that effective thinking must be used to improve the world.

Teaching how to think is not an add-on; it is the very heart of learning. It is not optional; it is a duty. The pedagogy of thinking not only helps develop cognitive skills, but also cultivates curious, ethical, and autonomous minds capable of facing the complexity of the world with judgment, creativity, and responsibility. To commit to it is to commit to a transformative and deeply human education.

All of this through collaboration, reflection, and ethical commitment, recognizing that effective thinking must be used to improve the world

This is our way of contributing to the education sector and to the community at large. Who's in?



THE TOWER OF TALENT, BAT

BY BIZKAIATECH EDITORIAL TEAM
/ ILLUSTRATION DAVID CORDEIRO

BAT is the center of entrepreneurship in Biscay, the place where the territory's **tech startups** come together. It is also a faithful representation of **STEAM** talent and a perfect example that **transformative projects** are fueled by **multidisciplinary teams**. Here's an idea of the **skills** associated with each of these letters.



S - SCIENCE - SCIENTISTS

- **Critical thinking** – incurably curious people who always ask “why?” and seek answers.
- **Observation skills** – they have a clinical eye that misses nothing. They see patterns where others see chaos.
- **Hypothesis formulation** – they have a theory for everything, and they test them!
- **Experimental design** – they build experiments like others build *LEGO* sets.
- **Data analysis** – their daily life is full of charts, tables, and formulas.

T - TECHNOLOGY - TECHNOLOGISTS

- **Technological adaptability** – natives of the brand new, they adopt every trending technology.
- **Systems integration** – connectors of worlds, almost like magic.
- **Systems thinking** – their mind runs in system mode; if they build it, everything fits and works.
- **Practical problem-solving** – they're so handy with everything digital related.
- **Maintenance and optimization** – everyday hackers who solve problems with ingenuity and speed.

E - ENGINEERING - ENGINEERS

- **Complex problem-solving thanks to their mechanical brain** – the solution is already thought out before the problem arises.

- **Logical and structured thinking** – their way of thinking comes with a built-in blueprint.
- **Applied technical knowledge** – their ideas take shape. Literally!
- **Project management and master planners** – (almost) nothing escapes their scheme or timeline.
- **Knowledge of safety and regulations** – without rules, there are no safe results.

A - ARTS - CREATIVES

- **Divergent thinking** – true idea factories, they can't stop imagining new things!
- **Visual and verbal communication skills** – polyglots of a chameleon-like language.
- **Aesthetic sensitivity** – they capture what inspires, transforms, and moves.
- **Improvisation skills** – where you freeze, they flow.
- **Narrative development and ideation** – they always have a story to tell.

M - MATHS - MATHEMATICIANS

- **Abstraction** – 100% mental. They play with abstract ideas like they're *Tetris* pieces.
- **Precision and rigor** – every number in its place, every step measured, please.
- **Mathematical modeling** – they make the chaotic world make sense with formulas and equations.
- **Analytical thinking** – able to break down complexity effortlessly.
- **Proof and demonstration skills** – their favorite tagline is “therefore...”.



How is looking for a restaurant similar to looking for an employee?

BY BIZKAIA TECH EDITORIAL TEAM / ILLUSTRATION ÁLVARO BUENDÍA

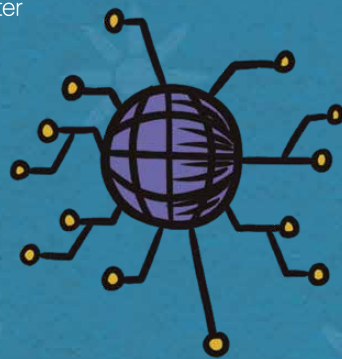




Did you know that many of the technological solutions developed by humans are direct inspirations from the nature around us? One example (perhaps not so well known) is the signaling logic shared by living cells and the Internet. Just as cells don't act randomly but respond to specific signals, Internet search engines emulate that behavior to return only relevant results. In both systems, biological and digital, the effectiveness of communication is the result of coherence, precision, and the art of being found. In this analogy, Search Engine Optimization (SEO) is presented as a kind of applied nature: it's not about raising your voice, but about speaking the right language, with the right tone and at the right moment, to trigger the optimal response.

WHAT'S SEO?

Search Engine Optimization, better known as SEO, is a strategy to improve the ranking of a website within a search engine, such as Google, Bing, Yahoo!, etc. Under this strategy, the structure and metadata (such as content type descriptions) of a website are optimized, as well as the content and keywords, so that users can find the most relevant sites.



ANALOGY: SEO – CELL RECEPTORS IN THE HUMAN BODY

At first glance, it seems logical and simple to tag our content to make it easier for users to find. This idea of tagging is also present in biological processes, for example, in the receptors that our body's cells use. These receptors can be found on the surface of a cell (or even inside it) and are activated when a specific molecule (called a "ligand") binds to them.

Let's imagine that each cell in our body is something like a house. On its doors (the surface of the cell membrane) it has locks to block or allow entry: these locks are the cell receptors. They are designed to be activated by certain "keys", those keys being the ligands mentioned before. These ligands may be substances from the environment, such as neurotransmitters, hormones, or even fragments of viruses.

Each lock or cell receptor will only be activated by a key or ligand that fits perfectly. When that happens, the lock turns, activating and triggering the process associated with that receptor.

Therefore, an analogy can be made between these locks and the keywords (and other parameters) optimized in SEO strategies.

In the case of search engines, the website would be a cell, and the ligand would be the search query from the user. To understand how this works in everyday searches, let's think of looking for an Italian restaurant for dinner. Our ligand might be something like "cheap Italian restaurant in Bilbao". In that case, the search engine will try to show the most relevant results, and one of the most important criteria to decide whether a result is relevant will be whether the restaurant's website includes keywords people actually search for, such as "homemade pizza," "cheap Italian food," "gluten-free," or "near the subway," among many others.

As we've seen, it's vital for a business to prepare good "ligands" so that search engines consider them relevant. At first, this may seem useful only for business owners, but... couldn't this be interesting for everyone? When looking for a job, for example, this can become very relevant.

A CV must be clean, concise, professionally designed, and well organized to make it easy to analyze and read, both by humans and by software



ANALOGY: BUSINESS SEO – CV SEO

In both cases, the ultimate goal is to stand out from the competition: to capture the attention of readers, whether human or automated, by appearing in the top results, whether on Google or in an employee search. For SEO, say for a restaurant, we would use keywords such as "cheap Italian restaurant in Bilbao" so the business appears at the top when someone searches for that. Descriptions, titles, menus, map location, and presence on relevant platforms will all be optimized to gain relevance.

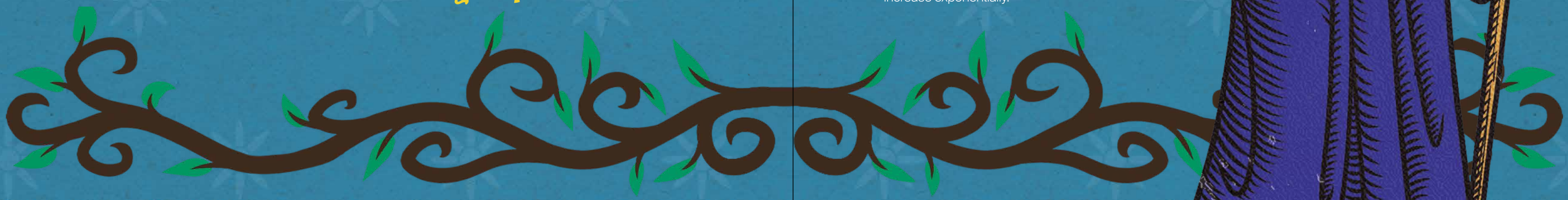
Similarly, when writing a résumé, it's crucial to use the keywords that the employer will be searching for, such as "project management," "CAD design," "customer service," etc., depending on the job we're applying for. This is even more important for automated systems or ATS (Applicant Tracking Systems), which are increasingly used by companies. These automated systems filter received résumés based on keywords (among other factors).

The effectiveness of communication is the result of coherence, precision, and the art of being found

Likewise, just as a website must be well-structured, fast, and clear for a search engine to rank it highly, a CV must be clean, concise, professionally designed, and well organized to make it easy to analyze and read, both by humans and by software.

As an illustrative example, if a job post requires experience in digital marketing, CRM, and social media, a résumé that only says "responsible for online communication" might go unnoticed, even if the applicant meets all the requirements. On the other hand, by making a minimal adjustment to match the requirements and writing something like "digital marketing specialist with experience in CRM and managing social media campaigns on Instagram and TikTok", the chances of being noticed and valued increase exponentially.

In short: following the signaling philosophy of living cells, it's important to understand what and how employers are searching. By making a few specific adjustments tailored to the vacancy we're applying for, we make sure our CV content is relevant, clear, and easy to find. In that sense, writing a well-targeted résumé is like doing SEO for companies. That's why, by using the right language and aligning your strengths and experience with what companies are seeking, your chances of success will increase significantly... you'll see.





TO FORMULA 1 AND BEYOND

BY BIZKAIATECH EDITORIAL TEAM / ILLUSTRATION AINGERU HERRERA

The queen category of motorsport, the elite of technology and data, the life of luxury and glamour, that magical place that fuses strategy and speed: this is Formula 1. Every race weekend, millions of people gather around their televisions to watch 20 single-seaters, each with its respective driver and colorful livery, lap at more than 210 km/h on spectacular circuits around the world. But F1 doesn't stop there, it goes much further.

Behind the spotlight shining on the gleaming cars are all those people who help build them, refine them, think up strategies, manage data... in other words, those who run the whole show. Quite the dream, right? But how does someone get to that position? What do you have to study to end up working in the top category of all motorsports?

INTRODUCING: FORMULA STUDENT BIZKAIA

Fortunately, in Biscay we have a spectacular option to get closer to this adrenaline-filled world: a teaching project, nonprofit, from the EHU called Formula Student Bizkaia (hereafter, FSB). It is a project open to all students at the School of Engineering of Bilbao, and it is completely voluntary both for the students and the faculty.

Using the Project Based Learning (PBL) methodology, the goal of those who accept this challenge is to create from scratch a competitive single-seater to compete against other international Formula Student programs. With over 10 years of work, the program has trained more than 400 people and guided them toward fulfilling their dream of working in the world of motorsport. For our part, we had the pleasure of speaking with two of these four hundred people to tell us a bit about how this process was. We present to you Gorka Martín and Nerea Marrodán, two talents who, after their time at FSB (and a lot of effort and sweat), got to experience firsthand what it's like to work in a Formula 1 team. Would you like to meet them?

FROM A DREAM TO REALITY, AND FROM REALITY TO A DREAM

It was childhood dreams that drove Gorka to participate in FSB: "Since I was little, I've felt a great passion for cars and the world of motorsport. I always dreamed of becoming one of those engineers I saw on television, working behind the scenes in Formula 1 teams. FSB represented the opportunity to take my first steps on that path, a real project where I could test myself and find out if I truly had what it takes to dedicate myself to it."

In Nerea's case, however (and interestingly), it was quite the opposite, as she tells us that the program caught her attention during one of the open days at the School of Engineering of Bilbao: "There were many students from different years participating, each wearing their red polo shirt and eager to tell what they devoted their time to after class. Their enthusiasm caught my attention right away, and I realized that it was the perfect opportunity to work in a team, create my own designs and get to know the world beyond university." After that, she was part of the team for three years, making "designing and building a race car with your own ideas and hands" a dream come true.

They both agree that their time in FSB was an incredibly positive and enriching experience. Nerea highlights the importance of applying everything studied theoretically in class, since that was the part that helped her find her true vocation. As she explains: "I was able to discover the areas I like to work in and those I don't, the way I like to work and the way I don't, and how to make projects succeed while enjoying the journey. Even though this is ultimately a changing process throughout our entire professional life, I see year after year that people who have participated in the team (or in similar projects) have a different perspective and a special way of facing real-world problems. And above all, a lot of passion for what they do." For his part, Gorka highlights three aspects of his experience: technical learning, collaboration between departments, and learning how to work under pressure and strict deadlines, which, as he points out, are quite common in the motorsport world. In short, he notes that the program is "a unique experience to grow both technically and personally."

IS THERE LIFE AFTER FSB?

As you might have guessed from the spoiler we gave you earlier, Gorka and Nerea had the chance to work firsthand in the top category, specifically (and respectively) at Red Bull Racing and Mercedes AMG High Performance Powertrains. Gorka was part of the team's aerodynamics department, while Nerea worked in the product engineering department. But what does this mean exactly?

The program has trained **more than 400 people** and guided them toward fulfilling their **dream of working in the world of motorsport**

Gorka worked as an aerodynamic analyst, and his job "focused on correlating the data obtained on track, CFD simulations (computational fluid dynamics), and wind tunnel tests. The goal was to ensure that each new aerodynamic design implemented on the car worked as expected in real conditions. This involved analyzing large volumes of data, validating predictive models, and working closely with designers to optimize the car's performance. It was a very technical role, but also strategic, since any improvement could translate into key tenths of a second during the race."

Nerea's job went in a similar direction: "My work, and that of my colleagues, was to analyze and fix possible mechanical failures of the F1 engines during the season, which had occurred in testing or during the Grand Prix. And if everything went well, to design and improve different parts or assemblies of the powertrain for the next season. In short, my role consisted of analyzing data and knowing how to use it to improve designs, finding the limit of sufficient durability with the least possible loss of milliseconds on track."

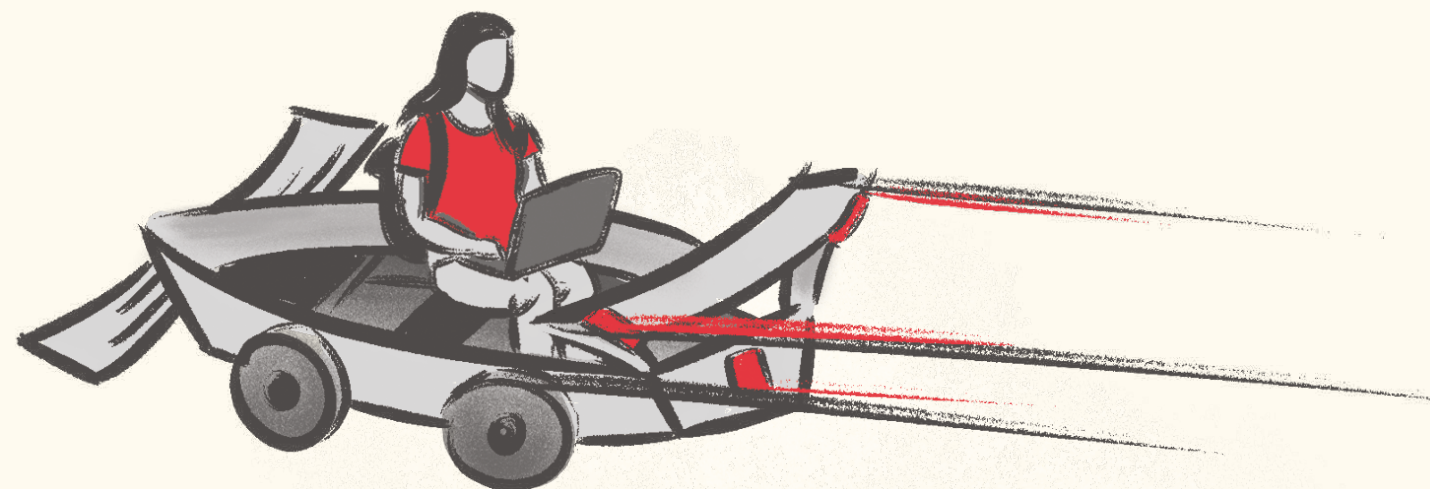
LET'S NOT WASTE TALENT

Do you know what the best part of this is? That if you've dreamed all your life of working in F1 (or if you've gotten curious reading this), you could be the next one wearing that famous red polo shirt. As Nerea and Gorka point out, if you have discipline, handle stress well, adapt easily, and know how to work as part of a team, you'll surely find your place in this exciting world. And once you become part of the FSB family, it's for life. As Gorka says: "To this day we keep in touch, and every time we meet we remember with admiration that stage that marked us so much. We always used to say: Once a Formula member, always a Formula member."

Did you know? – Formula 1 edition



Nerea tells you: Did you know that the factories develop and deliver a product, and then it's the team itself that travels from circuit to circuit to compete and give their best on track? It's amazing how much monitoring is done from home base, all the people who, without leaving the factory, adapt every week to different time zones (Miami, Japan, Australia...) to keep track of each phase of preparation and the race, and to stay in contact with the team to communicate every detail or start investigations if any setback arises. There are even test engines specifically dedicated to replicating track situations!



Once a Formula member, always a Formula member

Gorka tells you: Did you know that Formula 1 teams use real-time simulations to predict the car's behavior lap by lap, constantly updated with data sent directly from the car? We're talking about more than 1,000 telemetry channels transmitting information such as tire temperatures, micro aerodynamic variations, or component degradation.

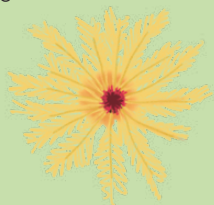
Did you know that every strategic decision (such as when to pit or what adjustments to make) can depend on minimal differences, like one degree in tire temperature or a tenth of a second in performance loss? It's like playing a chess match at 300 km/h, where every move is backed by thousands of data points processed instantly.

TALENT AS A DRIVER OF BISCAY'S FUTURE

BY BIZKAIA TALENT (GOVERNMENT OF BISCAY) / ILLUSTRATION AMALIA JULIETA



Twenty years ago, when talking about talent was not yet a trend, the Government of Biscay, together with several leading organizations, committed to an initiative that placed people at the center of territorial development. This is how Bizkaia Talent was born, a non-profit association that works on talent management from a territorial perspective, with the aim of making Biscay not only an attractive place to live, but also to develop professionally.



What began as a pilot project has become a benchmark in Europe. This long-term vision has proven key to addressing one of the greatest challenges of our time: ensuring that the right talent is in the right place, at the right time.

QUALIFIED TALENT, A STRATEGIC NEED

The challenge of talent is not a matter reserved for HR departments or management teams. It is a reality that directly influences the lives of all of us who live here. When a company cannot find the profiles it needs, it slows down its development, limits its capacity to innovate, or may even consider relocating part of its activity. Conversely, when it does find them, it triggers a virtuous circle: greater competitiveness, more jobs, more investment, more quality of life.

Various international studies have shown that for every highly qualified job, between two and five additional jobs are generated, many of them lower-skilled or in auxiliary sectors. In other words, highly qualified talent multiplies the economic and social impact of employment in our territory.

Biscay, like many advanced European regions, is facing a growing shortage of qualified professionals, especially in STEM areas (Science, Technology, Engineering, Mathematics). This gap is further aggravated by demographic aging and increasing global competition for the same specialized profiles that companies need to project themselves into the future.



A CONNECTED TALENT STRATEGY

At Bizkaia Talent, we address this challenge from a comprehensive perspective, with three main areas of action: developing local talent, attracting global talent, and linking talent to the territory.

Talent development begins by offering real opportunities to young local talent. Our *Talentia* program, active since 2014, is one of the main tools to connect university students with Biscay's business ecosystem. Since its launch, more than 1,700 students have trained in transversal skills and worked on challenges for Biscay-based companies.

This work is fundamental to anchor talent that might otherwise disconnect from the territory due to lack of awareness or weak connection with the market. Helping new generations to visualize a future in Biscay is an investment in competitiveness and social cohesion.

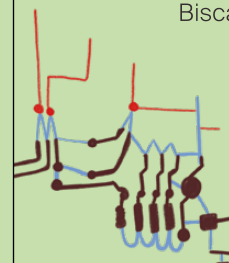
At the same time, we work intensively on attracting qualified talent. Our network of highly qualified professionals includes 24,000 people in more than 110 countries who, regardless of their place of origin, are or want to be connected to what happens here. Through our portal and international networking programs, we help organizations find the profiles they need and connect with professionals interested in settling in Biscay.

However, in the current context, attraction alone is not enough. That is why we provide companies and professionals with our welcome service and programs such as the Spouses Programme (aimed at facilitating the socio-labor integration of international professionals' partners), which in the first half of 2025 has already served 171 professionals and 38 partners associated with 77 companies, supporting not only their arrival, residence permits, and other administrative procedures, but also their sociocultural connection to the environment.

DIVERSITY AND INCLUSION: KEYS TO THE BUSINESS FUTURE

In the context of limited growth of the local working-age population, it will be essential to incorporate international talent across all sectors. This demographic need also represents a strategic opportunity.

Activities such as our international summer welcome event in 2025, with nearly 60 participants from



17 nationalities, reflect the global dimension that our ecosystem is beginning to take. Sociocultural activities to strengthen the human connection of newcomers reinforce the sense of belonging and help build an international community connected to our territory.

Although companies with diverse teams are more innovative and have greater capacity to operate in global markets, managing diversity can be complex. At Bizkaia Talent, we promote a new culture of openness, supporting organizations in adapting their processes and accompanying them along this path.



SHOWING OURSELVES TO THE WORLD

Surprisingly, most young people in the territory are unaware of the opportunities offered by local companies. At the same time, many qualified professionals abroad do not have Biscay on their radar. That is why it is not enough to offer good conditions; they must also be communicated effectively.

At Bizkaia Talent, we promote a dual approach. On the one hand, we support companies in developing their employer brand, helping them to improve the candidate and employee experience, organizational culture, and outreach. On the other hand, we work on positioning the territory, to place Biscay on the international talent map, projecting a coherent, aspirational, and content-rich image.

This alignment is key, since talent is not only looking for jobs. It seeks purpose, well-being, and environments in which to grow. And that is precisely what Biscay can offer if it manages to articulate its proposal as an ecosystem in a joint way.

A TERRITORIAL ALLIANCE

Aware that this challenge goes beyond any single organization, it is worth highlighting that the Government of Biscay has promoted the Biscay with the Talent strategy, an alliance with the active participation of dozens of companies and local stakeholders, in which Bizkaia Talent plays a key role in reducing the STEM gap through real and coordinated commitments to activate, attract, and retain the talent Biscay needs.

Projects such as Talent Strategy, Labo-Talento for SMEs, or the Self-Diagnosis Tool in Talent Management (*Autodiagnóstico en gestión del talento*), led by Bizkaia Talent, are helping to professionalize people management, especially in SMEs, thus consolidating a shared culture around talent as a lever for development.

THE FUTURE IS BUILT TODAY

All in all, the efforts made in recent years have begun to bear fruit. More and more people are choosing Biscay to continue their professional careers, and more organizations are improving their ability to attract key profiles, while increasingly understanding talent as a strategic axis.

Biscay is beginning to consolidate itself as an attractive territory for talent, and this is reflected in the decisions of those who, being able to live and work in many places around the world, choose to do so here.

Biscay is beginning to consolidate itself as an attractive territory for talent, and this is reflected in the decisions of those who, being able to live and work in many places around the world, choose to do so here

The coming years will be decisive. Biscay has a solid foundation: competitive industry, knowledge centers, infrastructure, quality of life... From Bizkaia Talent, we will continue working to ensure that our territory is recognized as an ecosystem where talent finds the ideal conditions to develop its full potential.

Because, in the end, talent is not just a production factor: it is the key to building a more prosperous, innovative, and inclusive society. And it is in our hands to build it together.





AI, A TOOL. CREATION, A HUMAN ACT



BY BIZKAIATECH EDITORIAL TEAM / ILLUSTRATION NEREA BERMEJO

AI has burst into every aspect of our lives like a bull in a china shop. It's very likely that we still don't fully know the true impact it will have; what seems evident is that it is already revolutionizing the way we study, work, consume, and relate to one another.



The omnipresence of artificial intelligence is sparking an interesting debate about purely human capacities and the possibility of technology replacing them. What about creativity? Is it possible for AI to replace talent, understood as a virtue that makes a person stand out in a particular field?

According to a Goldman Sachs study, AI could automate up to 26% of tasks in the arts and design sectors. Along the same lines, a McKinsey report concludes that 30% of working hours could be automated.

If Artemisia Gentileschi or Pablo Picasso had used AI tools to develop their legacy, what would their historical relevance be?

“WORKING WITH A TOOL FROM TECHNICAL KNOWLEDGE IS VERY DIFFERENT FROM DOING SO FROM CREATIVE KNOWLEDGE”

Arantza Lauzirika is an artist, a Doctor in Art and Audiovisual Media, Associate Professor, and researcher in the Art and Technology section at EHU. She is witnessing firsthand the impact this technology is having on artistic production.

She's clear about it.

“Artificial intelligence is just another tool,” she asserts with conviction in a conversation with BizkaiaTech Magazine. “It can be useful and help in creative processes, just as has happened before with other tools that, at the time, were either demonized or overvalued,” she explains. The expert believes that it will go through what she calls

hallucination phases: “that initial moment when everyone wants to use it for everything, as if it were the universal solution. Over time, everything finds its place, and the tool is integrated into the normal workflow.”

What are the specific aspects where AI is proving beneficial in the art sector? “It can streamline mechanical tasks that often, in autonomous and precarious work, fall entirely on the artist,” she explains. For example, in the case of an independent animation production where one single person does absolutely everything, AI could take care of mechanical processes or repetitive tasks. “In the industry, where every person has a defined role, this is less relevant, but in independent production, it can make a huge difference and greatly lighten these processes.”

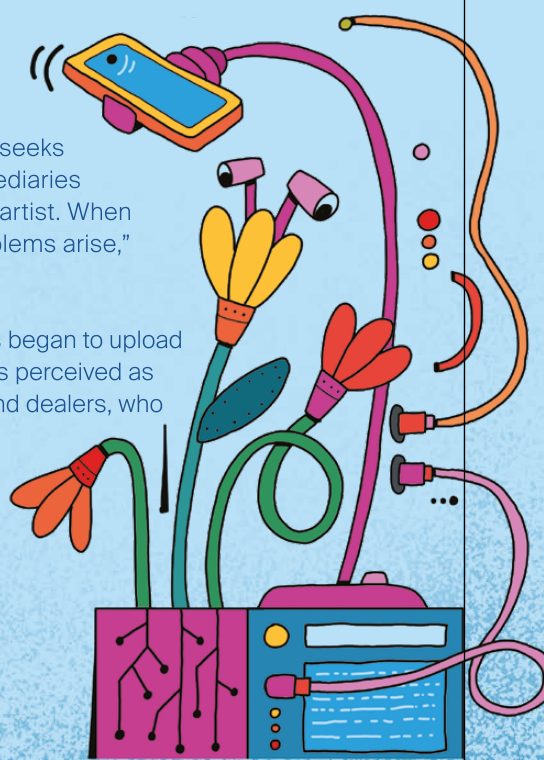
The debate on artificial intelligence in art cannot be separated from the fears it has sparked, and she knows this well. “With photography and with all preceding technologies, something similar happened,” she recalls. In the past, a photographer was both an artist and a technician. With the popularization of the photographic technique, the fear arose that anyone could take away their livelihood.

For Lauzirika, “mastering technique is not the same as creating.” That is, you can take photographs by letting yourself be carried away by what the camera gives you, without control or criteria, and that does not equate to creation. “Working with a tool from technical knowledge is very different from doing so from creative knowledge,” she argues.

THE INFLUENCE OF THE MARKET AND THE COMMODIFICATION OF ART

Her analysis broadens when we address the role of the market. “The market seeks profit, and there are intermediaries who live off the work of the artist. When their profits are at risk, problems arise,” she explains.

This happened when artists began to upload their work to websites: it was perceived as a threat to gallery owners and dealers, who



defended their role as essential. “History repeats itself constantly, although in increasingly shorter cycles.”

Throughout her career, she has always defended open knowledge and free licenses, but with nuances. One must distinguish between open knowledge for individuals and open knowledge for companies to exploit. “A free license, such as Creative Commons, is positive if the author decides that their work can be used with attribution and for non-commercial purposes. But when a social network imposes that everything you upload becomes its property, that's another story.”

She also recalls that since the 1980s, any creation automatically has copyright without the need for registration. In her view, “free licenses help to make use more flexible among individuals, but the problem arises when large platforms or companies use this content for profit without consent.” But this is not new either. “Tools like Photoshop or animation programs already created intermediate steps that the creator did not do manually. The difference now lies in the current scale and in the type of use, often to produce banal or viral content. I suppose that, once the fever of jokes passes, everything will return to its place, as has happened with other fads.”

THE IMPORTANCE OF INVESTING IN EDUCATION IN CULTURE

And what about talent? Is technology influencing the detection of innate talent?

For Lauzirika, talent is also a word that has been distorted and commodified, just like others such as entrepreneurship. “I don't believe in innate talent; it's a matter of education and work.” Many factors play a decisive role, such as cultural and educational context. The OECD (Organisation for Economic Co-operation and Development) recognizes that arts education contributes to the development of essential skills such as critical thinking, problem-solving, and creativity, although it suggests that the magnitude of this impact varies depending on the context and is not always measured in exact figures.

Meanwhile, according to the PISA 2022 report —an international study that measures the performance and skills of 15-year-old students—, 78% of students on average across the OECD reached at least the basic



level of creative thinking, an indicator that, experts agree, reinforces the importance of integrating the arts into education. These experiences not only enrich cultural expression but also strengthen key cognitive skills needed to function in society.

“A society that invests in the education of its young people in art and culture during school years —visiting exhibitions, reading, learning to appreciate, using creative processes as learning methodologies, practicing them, etc.— is generating an audience and a breeding ground where the consumption of culture and appreciation of art in all its forms is naturalized. If this is not encouraged, there is no foundation for anything to emerge.”

And she is not only referring to people dedicated to the art sector. It is something transversal and with enormous transformative power. Being creative is useful not only in art. These skills are useful in any field, not exclusively in the artistic one. So, there is a risk that cannot be ignored. “If the education system eliminates education in these competencies (or worse, replaces them with economics classes), we are forming people who only aspire to fame and money with minimal effort, something that current technology facilitates excessively.”

Her final reflection feels like both a warning and a proposal: artificial intelligence, like any tool, is neither good nor bad in itself. What matters is how, for what purpose, and with what knowledge it is used. “In the end, creation is still a human act. And no machine can replace that. Anyone can generate an image, only the trained and/or educated eye knows how to give it meaning and value.”



TALENT HAS NO AGE

Juanjo doesn't have much to do now that he's retired. He used to be a carpenter. He started working when he was still underage, at 16. Luckily, he liked what he did, and that was the case until the day he retired.

BY BIZKAIATECH EDITORIAL TEAM / ILLUSTRATION RUTH JUAN



BUTTERFLY EFFECT

As Edward N. Lorenz said, if there were two almost identical worlds, but in one of them a butterfly was flapping its wings and in the other it wasn't, this tiny animal could cause a tornado in that reality, while in the other, absolutely nothing would happen. We all know the butterfly effect, right?

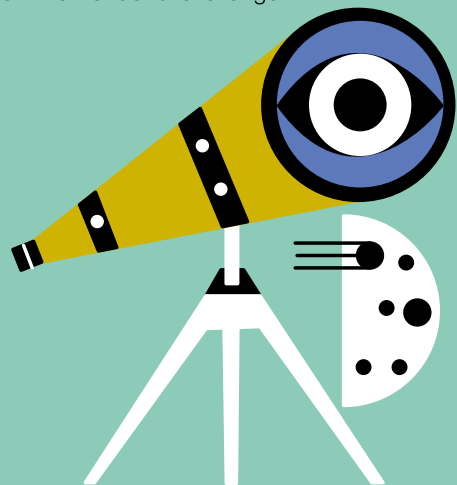
What would have happened if Juanjo had been given the chance to go to university? Or if his father had put him into the family business? Maybe he wouldn't be retired, maybe he wouldn't be happy, maybe he wouldn't have met his wife, and maybe his children wouldn't have been born. But all of this is in the past, right? And everyone knows you can't change the past... But do you know what you can still change? That's right, the future. Instead of thinking about the "what if...", Juanjo could think about the "what will happen if...", because even though he's retired, Juanjo can always discover a new passion, a new way of life, a new source of inspiration.

In our society, you're directed toward your working life while you're still a teenager. Maybe, like Juanjo, you made a choice that made you happy your whole life, but it could also be the opposite. Why should a decision made while hormones are still controlling you mark the rest of your life? The answer is simple: it doesn't have to.

BEYOND JUANJO

Juanjo was just an example (you know, so we're on the same page), but in reality, there are many adults who are getting hooked on learning new things. According to data from the Ministry of Universities (2023), nearly 10,000 people over 60 enrolled in different universities nationwide during the 2021/22 academic year. Lola Alonso is one of those people. After retiring, and as her third degree, she decided to study Modern Languages and their Literatures at the Complutense University of Madrid. She even went on Erasmus!

As for the Basque Country, 138 people over 60 decided to take on this wonderful challenge.



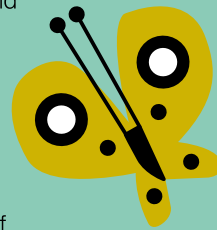
However, it's obvious that enrolling in a university is not the only way to keep learning. Anna Mary Robertson Moses, better known as Grandma Moses (1860–1961), was a clear example of this. She gave up her embroidery work at age 78 due to arthritis and began painting. After a collector discovered her work, Grandma Moses' artistic career took off, becoming part of American popular culture. She was even on the cover of *Time* magazine! When she died at 101, in 1961, Anna Mary Robertson Moses left behind more than 2,000 works as her legacy. She said that, although she started painting just to pass the time, in the end it became a very important part of her life and something that helped her connect with others.

But you don't have to become famous to learn something new: if we hop on a time machine and leave Grandma Moses far behind, we can travel to Biscay, where we find older people participating in the "Digital Kindness" programs of the Government of Biscay, where they learn to use digital tools to apply them in everyday life. And it's worth stressing: there's no such thing as small talent or small learning. Everything counts.

JUST IN CASE YOU'RE CURIOUS

If you're one of those people with curiosity and a spark for continuing to learn anything, keep reading because there are several options for acquiring new knowledge in very different ways and methods.

On the one hand, there's formal education, which means earning a degree at an institution authorized by educational administrations: a university degree or master's, a course, a stage of study, etc. This type of education is characterized by granting an official diploma approved by the relevant authorities, certifying that the graduate has sufficient competencies to move on to the next educational level. The Ministry of Education, Vocational Training and Sports states the following regarding this type of education for adults: "The education system must be flexible enough to allow adult training to be combined with work activity, and it must enable those who left their studies early to resume and complete them. That flexibility implies establishing connections between different types of education, facilitating the transition from one to another, and allowing the configuration of learning paths adapted to personal needs and interests."

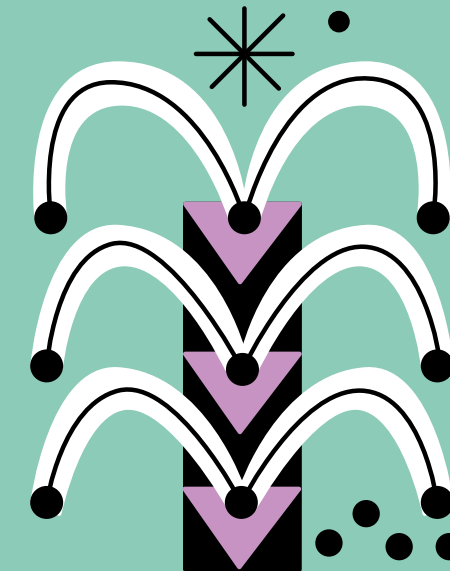


Then there's non-formal education, which generally serves as an alternative or complement to formal education, usually in the form of courses, workshops, or seminars. Since this type of education doesn't provide certificates endorsed by the relevant authorities, it's often pursued to meet personal learning goals, "such as personal development, promotion of community values, socio-cultural engagement, social participation, improvement of living conditions, artistic, technological, recreational or sports learning, among others," as the Ministry itself explains.

Lastly, there's informal education, all the learning that isn't institutionalized, that happens at home, at work, or in the community, among many other contexts. Learning math or programming on YouTube, learning to cook through a relative, or learning physics concepts by listening to a podcast would all be examples of this type of education. Let your creativity run free!

WHY SHOULD A DECISION MADE WHILE HORMONES ARE STILL CONTROLLING YOU MARK THE REST OF YOUR LIFE?

Although informal education is essential for learning from our environment, skills, and demands, here we'll focus on formal and non-formal education to highlight the options an adult or older person has for continuing to study different subjects. Let's start with what universities offer: EHU has a program called "Aulas de la experiencia de Bizkaia" where people without prior academic qualifications or experience, and over 55 years old, can obtain a University Degree in Humanities. For its part, the University of Deusto has been helping people regardless of age for 30 years with the program "DeustoBide – School of Citizenship," which until 2025 aimed to promote social exchanges and encourage critical and participatory citizenship. Starting this year, however, they



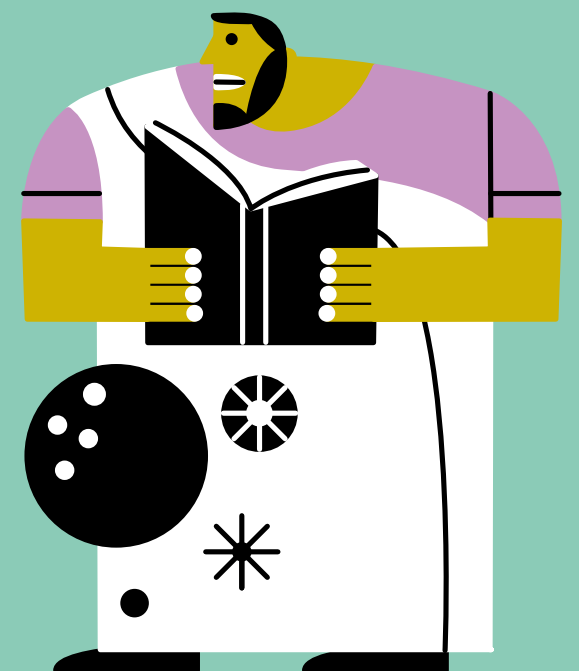
launched the program "Degree in Culture and Society," which offers a University Degree and the chance to relive or experience "the university lifestyle" for the first time. Finally, UNED (in Biscay) also has a senior program aimed at people over 55, whose main goal is to improve their quality of life.

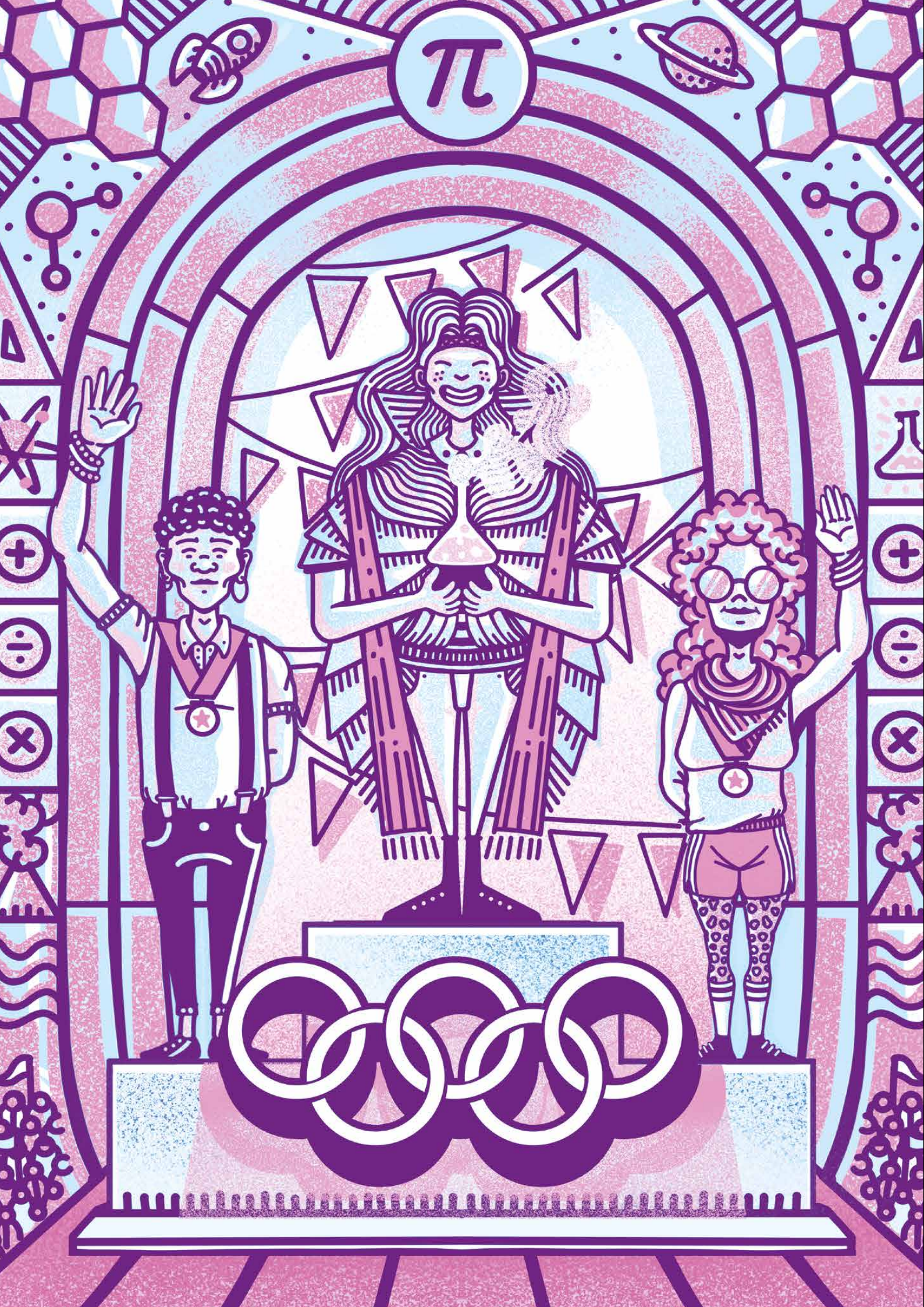
On the other hand, the Basque Government has set up a tool called "Ikasgunea," where anyone who wants to find a public center to keep learning can do so. In these centers, you can usually resume secondary education or follow the non-formal education path, with courses that teach you to speak Spanish or Basque, or courses that teach you to properly handle ICTs, among others.

THERE'S NO SUCH THING AS SMALL TALENT OR SMALL LEARNING

DON'T WAIT FOR THE BUTTERFLY

For all these reasons, it's important to think about what you can do in the present or near future; that way, while the Juanjo of a parallel world lives a life full of peace and, generally, boredom (I mean, what does a 70-year-old do waking up at 6 a.m. on a random Tuesday?), the Juanjo of this world could be discovering something that changes his life. We'll never know if it was because of the flap of a butterfly's wings or because of curiosity and a desire to learn... but let's hope it's the latter.





Eusko Label Olimpiads



BY BIZKAIATECH EDITORIAL TEAM / ILLUSTRATION RODILLO GRÁFICO

What do *Mean Girls* (2004), *High School Musical* (2006), and *Spiderman: Homecoming* (2017) have in common? Yes, yes, that they are all Hollywood box office hits that remain popular over the years, that's clear... But look a little closer... There's an element that repeats itself in all three movies but can easily go unnoticed... Got it? Exactly, in each of them, the protagonists take part in a science Olympiad.



Science Olympiads are national or international competitions dating back to the mid-20th century, where high school students compete to see who takes home the trophy for being the best-prepared student or school. International Olympiads are generally divided into

twelve competitions and categories: mathematics, physics, chemistry, computer science, biology, philosophy, astronomy, astrophysics, geography, linguistics, the junior science Olympiad, and earth sciences.

You might be thinking this is more American than cheeseburgers and the Super Bowl... and while it's true that in the United States this is a very common practice (with more than 6,600 teams and 425 competitions nationwide), you don't have to go far to find some of these competitions.

Yes, yes, right here in Biscay, 4th-year ESO and high school students also have the chance to sign up for a competition in their favorite STEM field. Want to know more?

PETER OR PERU PARKER?

Every year, EHU hosts scientific Olympiads at its facilities where students from the Basque Country can take on this exciting challenge and win fantastic prizes, such as representing the Basque Country in the national science Olympiads. Sounds good, right?

These Olympiads are divided into five categories. The first is the biology Olympiad, where the top three students win a direct pass to the national Olympiads, and if they make it to the podium there, they also qualify for the international Olympiad. In the 2025 edition, the tests organized by the Faculty of Science and Technology at EHU took place at the Leioa Campus (Biscay) and at the Faculty of Chemistry on the San Sebastián Campus (Gipuzkoa), with 50 students from 23 schools participating.

The physics Olympiad is the next competition in which Basque students can qualify, again for nationals and then internationals. However, this Olympiad is organized by the Spanish Royal Society of Physics and is aimed at first- and second-year high school students. The test is divided into

two phases: the theoretical, held simultaneously at the Biscay, Gipuzkoa, and Alava campuses of EHU, and the experimental, where only those with the best theoretical results participate. The latter takes place at the Leioa Campus (Biscay).

The third category is the geology Olympiad, aimed at "stimulating and involving final-year ESO and high school students in the knowledge of this science, while highlighting its importance in today's world, promoting its progress and dissemination." This one also qualifies for nationals and internationals and consists of a 50-question multiple-choice exam and a practical test where students must identify different rocks, minerals, structures, and fossils. Then, the five best participants face off in a public battle royale-style showdown where the last one standing wins. Exciting!

The mathematics Olympiad (Hollywood's all-time favorite) aims to foster mathematical talent among students and select, like the others, their representatives for national and international competitions. The local test consists of (surprise) solving math problems and is held at the Leioa Campus (Biscay).

Finally, there's the chemistry Olympiad, held at the Biscay and Gipuzkoa campuses, which, like the others (altogether now), serves to qualify for further competitions. In a letter addressed to schools, Marian Iriarte, Dean of the Faculty of Chemistry at EHU, encourages students to take part in this activity because, in her words, "participating in the Olympiads offers students a wonderful opportunity to test their knowledge, get a first taste of university life, and meet other students."

Right here in Biscay, 4th-year ESO and high school students also have the chance to sign up for a competition in their favorite STEM field



THE GLAMOUR IS IN THE MIND

Maybe our Olympiads aren't as spectacular as the ones in the movies, maybe you don't get to be part of a team with cool jackets, have a bus wrapped in your school colors, or shoot webs from your wrists, but one thing's certain: in our region, there are plenty of young people with great STEM talent.

So, if you're old enough to participate in one of these Olympiads and they've sparked even a little curiosity in you, don't hesitate to check the universities' websites to see the syllabus and practice exercises you could try out, this might be the start of a wonderful journey. And if you're a teacher and someone immediately comes to mind who would love this, don't hesitate to bring it up with them and also with the school, they'll surely think it's a great idea! And hey, maybe not team jackets, but some team T-shirts... could be an option.

In our region, there are plenty of young people with great STEM talent

START YOUR ENGINES

Do you think you could take part in one of these olympiads? Well, let's see if you can handle this chemistry question... Ready to solve it?

Chemistry – Question: The oxygen molecule is larger than the hydrogen molecule, therefore:

- a)** Under normal conditions, one mole of oxygen occupies a larger volume than one mole of hydrogen.
- b)** The price of one mole of oxygen is higher than that of one mole of hydrogen.
- c)** Under normal conditions, one mole of oxygen and one mole of hydrogen occupy the same volume.
- d)** Water contains two atoms of hydrogen and one of oxygen, so that both elements occupy the same fraction of the molecule's volume.



Solution:

a) False. The volume occupied by gas molecules is negligible compared to the volume of the gas.

b) False. This proposal is absurd, as the price of a substance is not related to its physical and chemical properties.

c) True. According to Avogadro's law (1811), which states: "equal volumes of any gas, measured under identical pressure and temperature conditions, contain the same number of molecules."

$$V = n \frac{RT}{p}$$

If gases are compared under the same p and T, and given that R is a constant, then:

$$V = n k \quad \text{where } k \text{ is the molar volume.}$$

d) False. This proposal also makes no sense.

The correct answer is c.



THERE'S NO ART

ARTISTS OF ILLUSTRATION



Bermi (Nerea Bermejo)

Architectural illustrator and visual artist. Her work bridges the representation of urban and natural spaces with cultural and creative projects.

📷 @missbermi



Aingeru Herrera

Illustrator and graphic designer. Specialized in sports illustration. Co-author of the book "Athleticlandia."

📷 @aingeruh



Ione Larrañaga

Freelance illustrator; her images, rich in detail, convey a sense of lightness and dreaminess.

📷 @ione_larrago



Paula Guerrero

Comic artist; the narration of the stories spills into the illustrations. They draw by hand, combining linework with digital color.

📷 @paula__guerrero



Nuria Hache

Illustrator and graphic designer, focused on education, visual communication, and outreach.

📷 @nuria.hache



Álvaro M. Buendía

Cantabrian illustrator based in Bilbao, passionate about art and medieval history, approached from a contemporary perspective.

📷 @alvarom.buendia



Laura Barquín

She is an illustrator and graphic designer who has worked with different companies and several institutions. She pays close attention to color and the atmosphere of her scenes.

📷 @laurabarquin



Amalia Julieta

Painter and draftsman, great-granddaughter of Basques, granddaughter of Lithuanians, daughter of Argentinians. Above all, she paints women.

📷 @amahelarte



Mabel Esteban

She is an illustrator and graphic designer who has worked with different companies and several institutions. She pays close attention to color and the atmosphere of her scenes.

📷 @mabel.esteban



David Cordeiro

Graphic designer and illustrator. Currently working at Accenture as a designer on the BizkaiaTech Magazine project.

📷 @o.makako



Ruth Juan

Illustrator and founder of the brand Junita Makina, her work focuses on urban, everyday and social issues.

📷 @junitamakina



Rodillo Gráfico

He creates images. Sometimes he draws, sometimes he cuts and pastes, animates, models, screen prints, vectorizes, or paints. Since 2014, he has been running the RODILLO project.

📷 @rodillografico

WITHOUT ARTIST

ARTISTS OF THE WORD



Miren Munitis

Diploma in Early Childhood Education and degree in Psychopedagogy. Teacher, coordinator, trainer, and pedagogical director; TBL coach; designer of educational programs.

📷



Bizkaia Talent

A non-profit initiative with one mission: to promote the establishment in Biscay of the right conditions to attract, connect, and retain qualified people.

🌐 bizkaia talent.eus



Mentxu Ramilo

In(ter)dependent Professional. Political scientist with the soul of an anthropologist. Wikimedian and driving force behind WikiEmakumeek and other initiatives.

📷

WE COULDN'T HAVE DONE IT WITHOUT...



Gorka Martín

Graduate in Industrial Technologies Engineering and Master in Industrial Engineering. Has two master's degrees and is Global R&D Manager at Gestamp.

📷



Nerea Marrodan

Engineer. Designing the cars of today and tomorrow.

📷



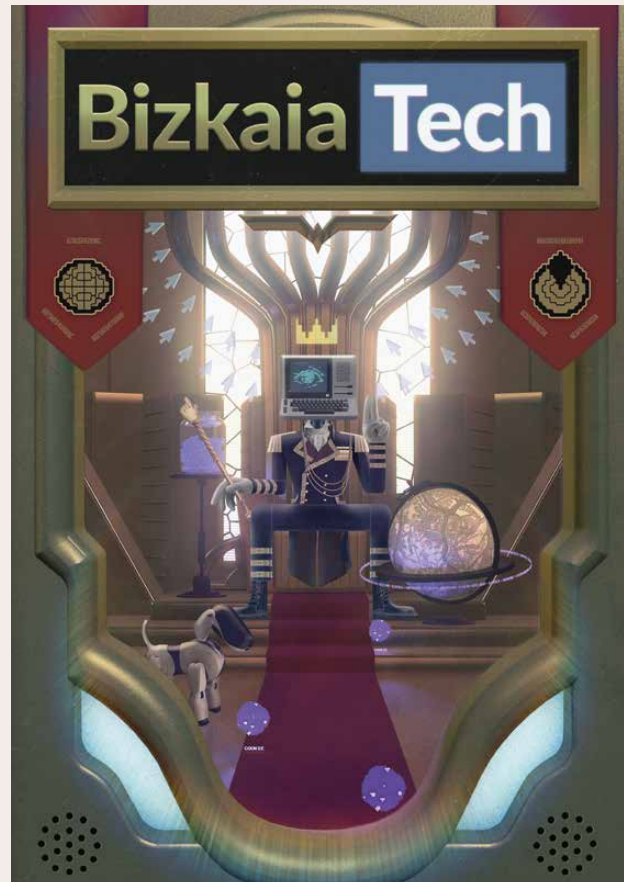
Arantza Lauzirika

Artist, teacher, author, and researcher at the Department of Sculpture and of Art and Technology at EHU. Principal Investigator of the AKMEKA group.

COME & COLLECT

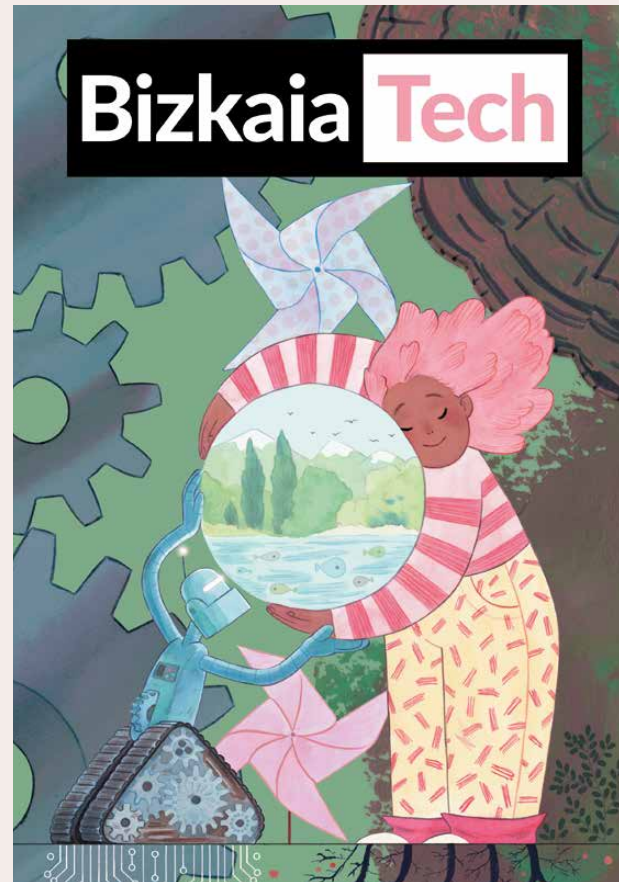
Issue 12 |

Have you read the terms and conditions?



Issue 11 |

Passing Without Leaving a Trace



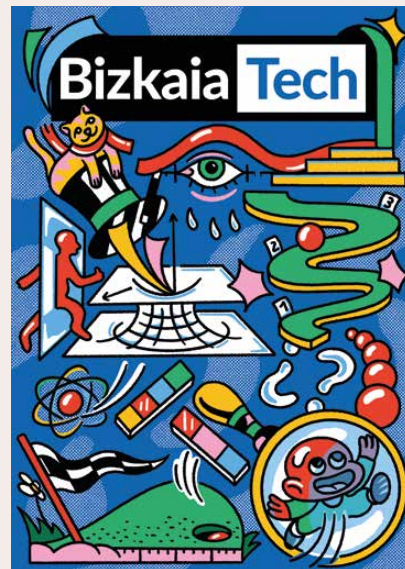
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Hey, ChatGPT, could you sing me a bertso?



Issue 09 |

Blessed and Wonderful Particles!



Issue 08 |

The Internet isn't just sparkles in the air

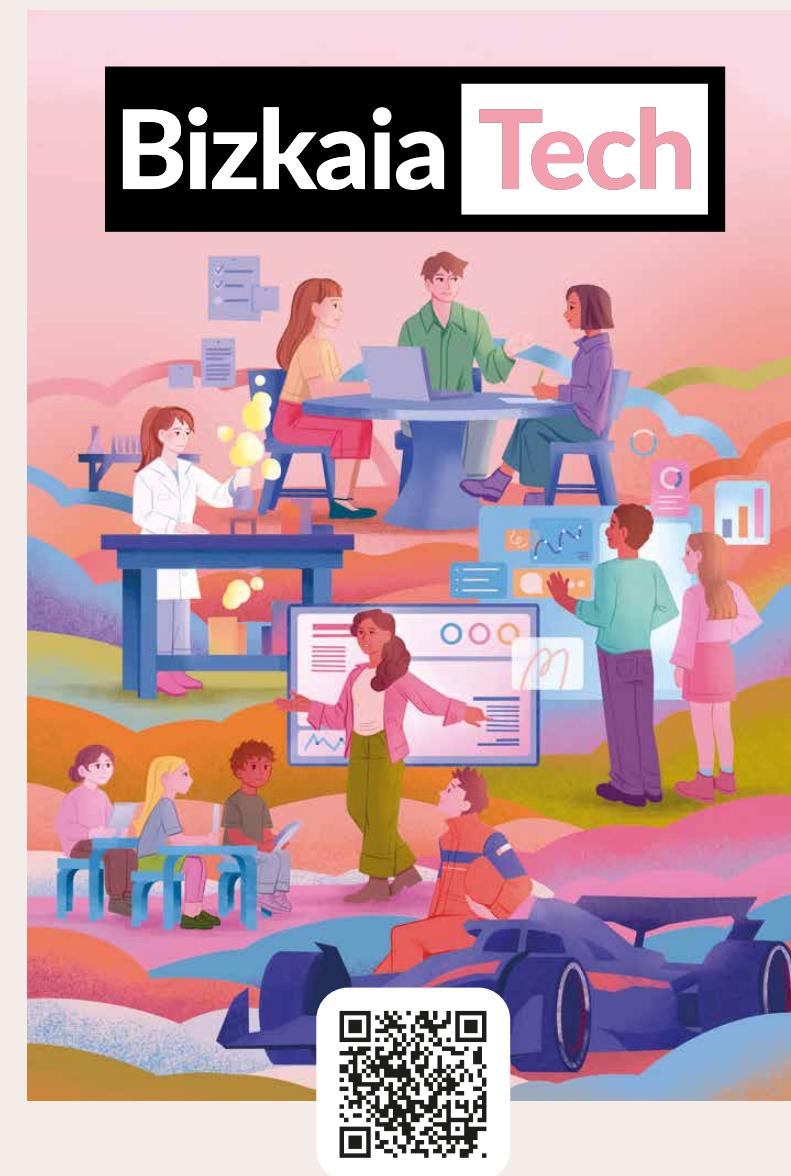


ALL OUR (ART)ICLES

Enjoy the mix between art and technology

Just like a techy tarotist, let yourself be surprised by all the magazines on our website:
BizkaiaTech Magazine, which will explain the present and give you a glimpse of the future.

On the cover: **Laura Barquín**



CREATORS: THIS IS YOUR PLACE

If you constantly question everything,
you have nonconformity as a flag and you always
want to know more, you are in the right place.

BizkaiaTech Magazine is a space open to collaboration and participation where you can claim your talent and satisfy your curiosity. We invite you to show what you do: your digital art, your reflections on technology or life, raise new topics or present fresh, bizarre or different ideas.

If you would like to collaborate, send us an email to **bizkaiatech@bizkaia.eus**
and we will be happy to know what you have in mind.

The Government of Biscay and Lantik do not necessarily endorse the opinions of those who have created this magazine or the opinions of its external collaborators.



@bizkaiatechmagazine

Bizkaia Tech