Institute guide and tutorial

Expanded illustrated edition · 2026

Illustrated guide to navigate the site, master every Bibliometric Intelligence Laboratory session, save its results and use the metrics reports in research methodology; with a design catalogue and software-engineering annex.

How to use this document

It is organised in five parts. I explains what the site is for, what is public and what is not, which standards it aligns with and its limits. II teaches navigation: menu, signs, shortcuts and each section. III goes inside the Laboratory. IV shows what you can save and how to use the reports in your research. V presents the design catalogue and, for technical teams, the software engineering. Read only what you need: the contents are linked.

This tutorial describes exploratory tools. The in-house indices (LORMAR/IPDF, ERL) use theoretical weights not yet empirically validated; alignments with external standards are indicative, not certifications. No figure demonstrates causality on its own.

Dr. Rafael Lorenzo-Martín · rafael-lorenzo.institute

Interactive web version: rafael-lorenzo.institute/tutorial

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Part I · Getting to know the Institute: purposes, value, standards and limits

1. Welcome: what this site is and what it is for

rafael-lorenzo.institute brings together Dr. Rafael Lorenzo-Martín's academic portal and a Bibliometric Intelligence Laboratory. The portal shows career, publications, lectures, certified events, infographics and outreach channels. The Laboratory takes a research topic (or your own Web of Science, Scopus or SciELO file) and returns the intellectual map of the field: thematic communities, bridges, gaps, key works, frontier indices and an APA 7 PDF report. Think of it as a library with a team of analysts who help you see the forest before studying each tree.

Research purpose

To help place a problem within its field, ground the state of the art in reproducible data, detect opportunities (gaps, bridges, emerging topics) and formulate testable hypotheses. Results are inputs for research, not closed conclusions.

Training purpose

To teach how to read metrics critically: every figure comes with its explanation, limits and questions for the researcher. The site is also a classroom: it trains critical-complex thinking, cognitive sovereignty and responsible AI use (M.I.C.H. approach).

Outreach purpose

To share lectures, essays, infographics and open debates with teachers, students and institutions in Ibero-America and worldwide.

Who uses it

Researchers and doctoral students (state of the art and gaps), mentors and committees (originality verdicts), STI managers and universities (priorities, partnerships, funding), teachers (training material).

Three languages

The whole site, the Laboratory and this tutorial work in Spanish, English and Portuguese. Your chosen language is remembered next time. The comprehensive PDF report is produced in Spanish and English.

2. Why this site is different: rationale and practical value

Most bibliometric platforms give you numbers. This one gives you questions. Commercial databases count citations; network programs draw graphs you must know how to read; academic search engines rank by popularity. The Laboratory joins all three and adds what is almost always missing: translating data into a research decision, with its limits written alongside. It does not promise to reveal the truth of a field: it promises to show you honestly where to look.

From data to decision

Every figure ends with a reading for the researcher: what it means, what it does not mean and what question it opens. That bridge between metrics and methodology is the core contribution.

Hybrid, not automatic, intelligence

Mathematical calculations (networks, factors, regressions, indices) run on real OpenAlex data; AI only proposes structure and interpretation, always under human review. This is the M.I.C.H. principle: the machine expands, the person decides.

In-house indices with a validation agenda

The LORMAR Number (IPDF) and the Maturity Scale (ERL) are original contributions. They are presented with declared theoretical weights and a script to calibrate them empirically: novelty is offered to be tested, not believed.

Differences from other tools

Compared with Google Scholar or ResearchGate (search and profiles), Scopus/WoS Analytics (licensed indicators), VOSviewer or bibliometrix (powerful but technical) and Dimensions (commercial): here corpus access is open (OpenAlex, CC0), the interface is trilingual, reading is didactic and everything can be repeated in RStudio. It does not replace those tools: it connects them and prepares you to use them.

Efficiency in the research process

An exploratory mapping that takes days by hand (search, clean, count, chart, write) is obtained in minutes as a starting point. This is a usage estimate, not a controlled measurement: actual savings depend on the field and should be assessed. What is verifiable is that each step is documented with its Query ID and can be repeated.

Epistemic honesty as a hallmark

Every result is labelled as finding, protocol or hypothesis. An unavailable KMO is never turned into zero; a gap against the horizon is never sold as a guarantee of impact. That transparency is a competitive advantage: what is stated here can be defended before a committee.

3. What is public and what is restricted

Not every section is meant for the public. The site clearly separates what any visitor can use, what requires the administrator key (because it consumes AI credits) and what is private by nature.

Level	What it includes	Who can access
Public	Home and all its sections, Curriculum, Manifesto, Agenda, Testimonials, Contacts, Infographics, Guide and tutorial, Laboratory overview, «Cite» buttons, open forum and newsletter.	Any visitor
With administrator key	Laboratory processing, M.I.C.H. assistant, «Explore with AI», AI epistemic gaps and any function that spends artificial intelligence credits.	People authorised by the director
Private	Administration panel, contact messages, subscriber list, the director's personal email and service keys.	Only the administrator with a confirmed email

Why there is a key

Each AI analysis has a cost. The key prevents massive or automated use and keeps the Laboratory available for research and training.

How to request access

Write from «Contacts» or the «Write to me» button stating institution and purpose (thesis, project, course). The key is stored only in the browser tab and is erased when you close it.

4. Standards and reference frameworks

The site states which standards it aligns with and to what extent. Alignment is not certification: alignments are indicative and are stated as such in every report.

Standard or framework	How it is applied	Scope
APA 7	Numbered figures, titles above, notes below, references and citations.	Applied
DORA · Leiden Manifesto · CoARA	Metrics guide and never replace expert reading; citations ≠ quality.	Guiding principle
PRISMA-S	Guides search reporting (equation, source, date, filters).	Indicative; not a full systematic review
FAIR and open science	OpenAlex CC0 data, open exports, reproducible script and Query ID.	Applied
UNESCO (AI ethics)	AI under human control, transparency and no replacement of judgement.	Guiding principle
ISO 56002 / 56006	Strategic intelligence and innovation as a reading frame for IPDF.	Declared alignment, not certification
Web accessibility (WCAG guidelines)	Contrast, keyboard, alt text, reduced motion, text-to-speech.	Guided by the guidelines; no formal audit

5. Strengths and limits

Using a tool well starts with knowing what it can and cannot do.

Can: map a field in minutes

Clusters, co-occurrence networks, strategic quadrants, co-authorship, open science, timeline and key works on a real sample.

Can: generate hypotheses and agendas

Structural holes, bridges and emerging topics are turned into questions, objectives and possible designs for theses and projects.

Can: integrate your own databases

RIS/CSV files from WoS, Scopus or SciELO are combined with OpenAlex without duplicate DOIs.

Cannot: prove causality

Two topics appearing together does not mean one causes the other. Relationships are co-occurrence.

Cannot: guarantee novelty or impact

A detected gap is an opportunity to check by reading the literature, not a promise of publication.

Cannot: cover everything published

OpenAlex is broad but not exhaustive; language, document type and missing metadata (abstracts, quartiles, corresponding author) affect results. Quartile is not reported because OpenAlex does not provide it.

Cannot: replace the researcher

Reading the works, theoretical judgement and methodological decisions remain human.

Part II · Navigating the site: menu, signage, shortcuts and sections

6. Overall site structure

The site has one long home page, organised into sections reached from the menu, and seven separate pages. You can scroll top to bottom or jump with the menu.

Figure 1

Cover: Laboratory logo, title, director's introduction, language selector and quick links.



Note. Screenshot of rafael-lorenzo.institute (2026).

Area	Content
Home (main page)	Cover · Profile · Lines · Map · Lectures · Certified events · Newsletter · Channel · Infographics & forum · Explore with AI · Laboratory · Publications · Projects · Contact · Social · Footer
Separate pages	Curriculum · Manifesto · Guide & tutorial · Agenda · Testimonials · Contacts · Infographics
Open services	Scientific RSS feed, access QR codes, links to ORCID, Google Scholar, Wikidata and YouTube

7. The top menu, button by button

The menu stays fixed at the top while you scroll. Each button has an icon and a coloured underline showing the type of destination. Buttons leading to another page change screen; the others glide to the section within Home. On mobile, open the menu with the three-line button.

Figure 2

Top menu with colour-coded buttons: gold (academic), blue (research) and violet (community).



Note. Screenshot of rafael-lorenzo.institute (2026).

Button	What it opens	Signal
Profile	Career and current positions	Gold · academic
Curriculum	Page with the full CV, downloadable as PDF	Gold · page
Manifesto	Principles of the Hybrid Research Institute	Gold · page
Guide & tutorial	This tutorial and its PDFs	Gold · page
Research	Research lines and map	Blue · research
Lectures · Events · Channel	Videos, certified participation and channel posts	Gold · academic
Projects	Ongoing initiatives	Gold · academic
Explore with AI	Topic-based content recommender (key required)	Blue · research
Scientometrics	Bibliometric Intelligence Laboratory	Blue · research
Publications	Scientific output with filters and «Cite» button	Gold · academic
Agenda	Page of upcoming congresses and courses	Gold · page

Button	What it opens	Signal
Infographics & Forum	Interactive posters and open debate	Violet · community
Testimonials · Newsletter · Contacts	Opinions, subscription and message form	Violet · community

Progress bar

A thin line under the menu fills as you scroll: it shows how much of the page you have covered.

Language selector

The ES, EN and PT flags change every text instantly and the choice is saved.

8. Signage: icons, colours and seals

The site uses a consistent visual language. Learning it once lets you find your way in any section and in the reports.

Sign	Meaning
Gold underline on a button	Academic destination (career, output, institutional pages)
Blue underline	Research destination (Laboratory, lines, AI)
Violet underline	Community destination (forum, newsletter, contact, testimonials)
Uppercase tag with a line (e.g. «PROFILE —»)	Name of the section you are in
«↑ Back to top»	Returns to the cover from any section
Lock / «Unlock»	Function requiring a key because it spends AI credits
Magnifier · folder · helix (blue, green, magenta)	The three Laboratory modes: topic only, file only, hybrid
Holographic box (glass with sheen)	Interactive module or Laboratory result
Gold ring around a chart circle	Bridge potential ≥ 70 between hemispheres
Blue / red segment on the radar	Corpus ≥ horizon (blue) or horizon > corpus (red)
Holographic seal on PDF figures	Identity decoration: never represents data
«Figure for article» bar	Downloads the figure as vector SVG or 600 dpi PNG, with white or dark background
QR code	Quick mobile access; downloadable as PNG or print SVG

9. Shortcuts and navigation combinations

The site does not invent its own shortcuts: it respects browser and chart standards, so they work the same everywhere and with screen readers.

Action	Combination
Move to next / previous button or link	Tab / Shift + Tab
Activate the chosen button	Enter or Space
Close windows («Cite», full screen, accessibility)	Esc
Go to top / bottom of page	Home / End (Cmd + ↑ / ↓ on Mac)
Find a word on the page	Ctrl + F (Cmd + F)
Zoom in / out / reset	Ctrl + / Ctrl − / Ctrl 0
Go back to the previous section	Alt + ← (or Back button)
Share a section	Copy the address with its anchor, e.g. .../#cienciometria
Zoom on an interactive chart	Drag a rectangle; double-click resets
Pan the chart / see details	Chart toolbar «pan» tool; hover (or tap) a point
Run the script in RStudio	Ctrl + Shift + S («Source»)
Save the PDF or print	Ctrl + S / Ctrl + P in the viewer

10. Accessibility panel

The round blue button at the bottom left opens a panel to adapt reading to your needs. Changes persist while you browse.

Text size

«− T» and «+ T» shrink or enlarge the whole site's text; the percentage shows the current value.

High contrast

Black background, white text and cyan and yellow accents, with no transparency.

Readable typeface

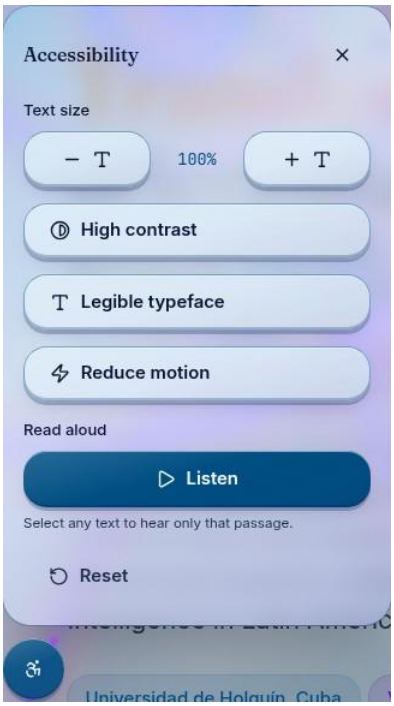
Replaces decorative fonts with a plain, well-spaced typeface.

Reduce motion

Stops fractals, sheens and motion; useful against dizziness or to focus.

Text to speech
«Listen» reads the page aloud; if you select text, it reads only that passage. «Reset» restores everything.

Figure 3
Accessibility panel open.



Note. Screenshot of rafael-lorenzo.institute (2026).

11. Profile, research lines and map

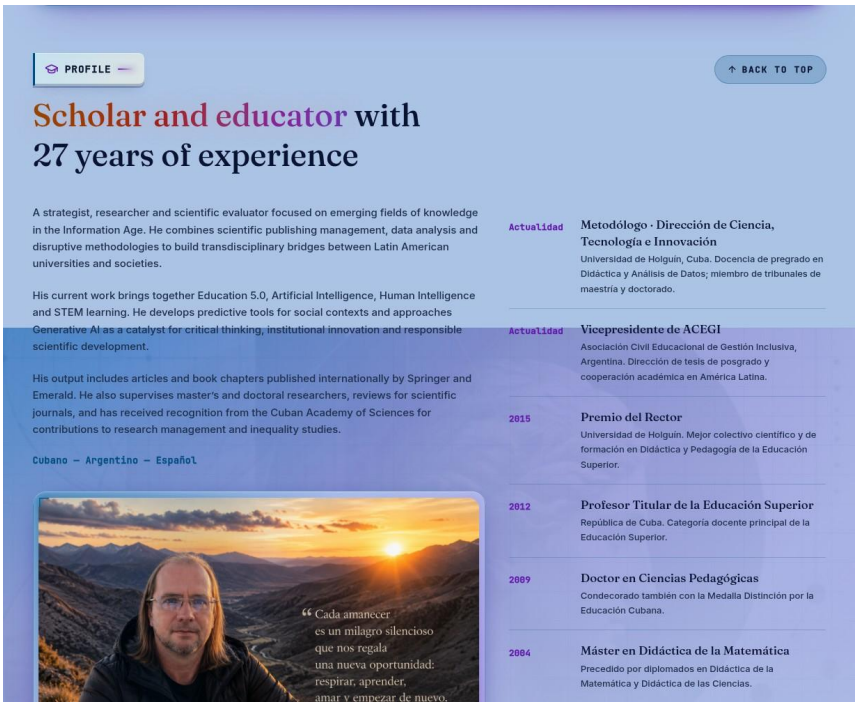
The first sections introduce the director, what he works on and where he collaborates.

Line cards
Eight areas (Academia, Research, Educational quality, Mathematics, Didactics, Educational technology, Management, AI). The corner arrow shows the card is a link.

Dedication bars
Show the relative weight of each line in recent output.

Figure 4

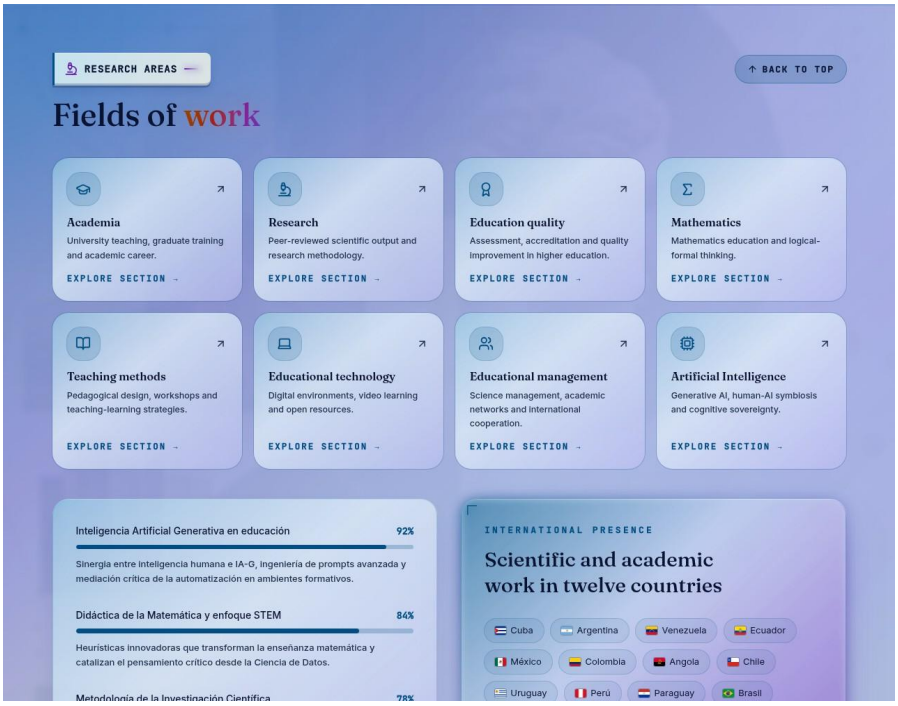
Profile: biography on the left and timeline of positions and awards on the right.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 5

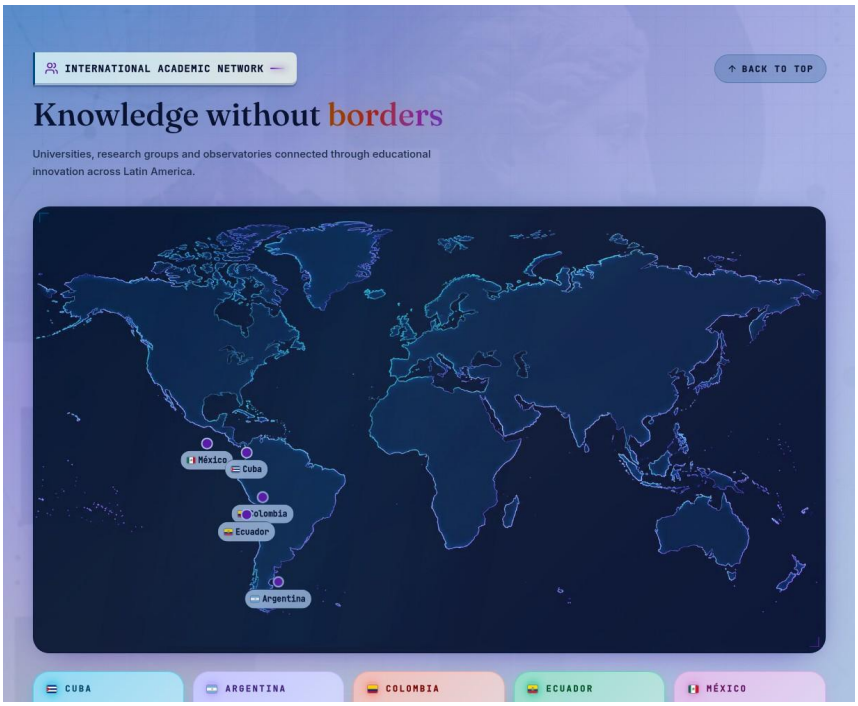
Research lines: each card leads to related content («Explore section»).



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 6

Interactive map of the international academic network: dots mark collaborating countries.



Note. Screenshot of rafael-lorenzo.institute (2026).

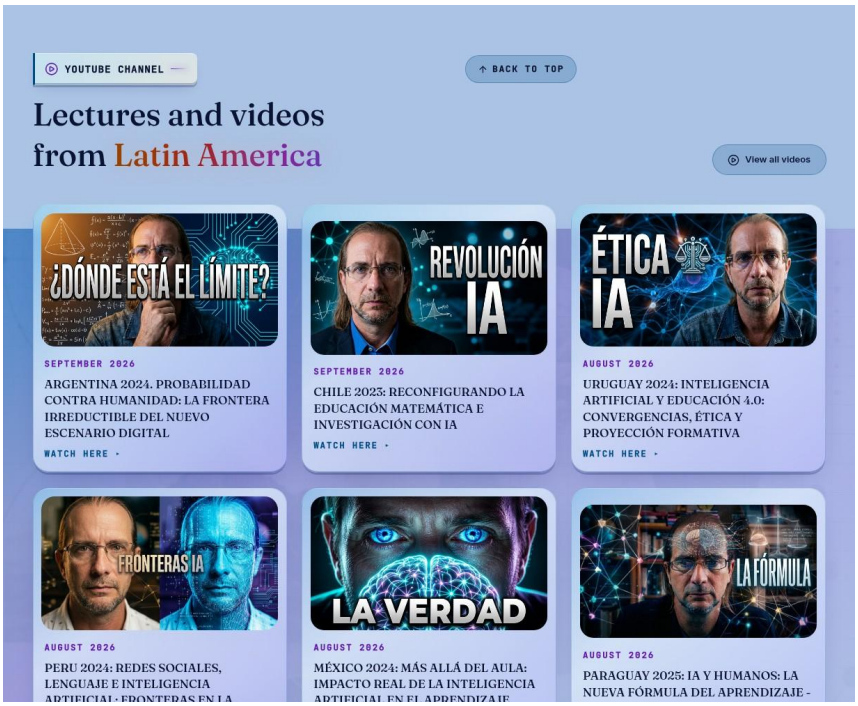
12. Lectures, certified events and channel

Three sections show academic activity on video and at events with verifiable certificates.

> **Event timeline**
>
> The ‹ › arrows browse years; «See the year» filters. On the map, tap a country or its chip to see only its events; the number shows how many.

Figure 7

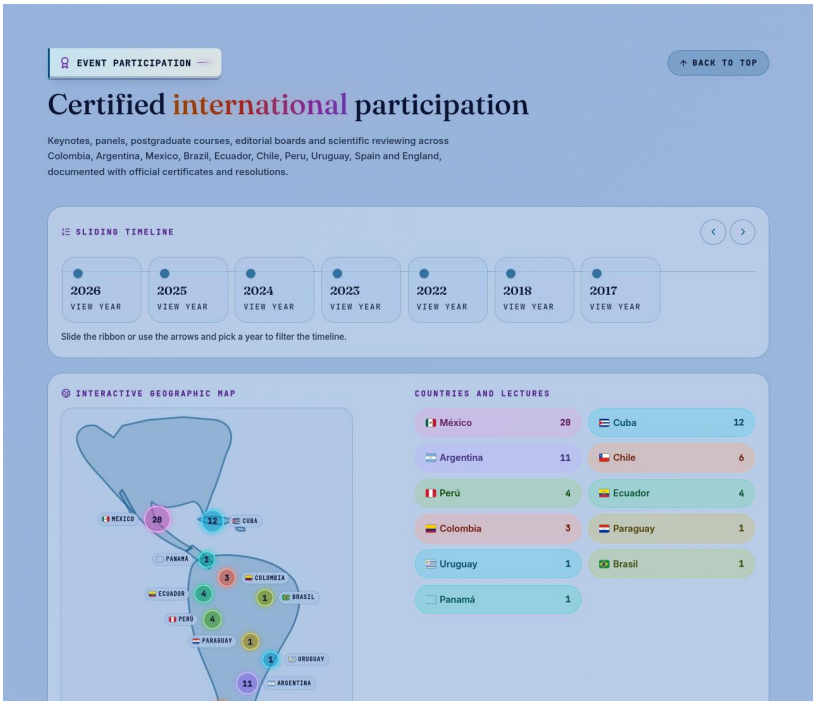
Lectures: each card opens the video without leaving the site; «See all videos» goes to YouTube.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 8

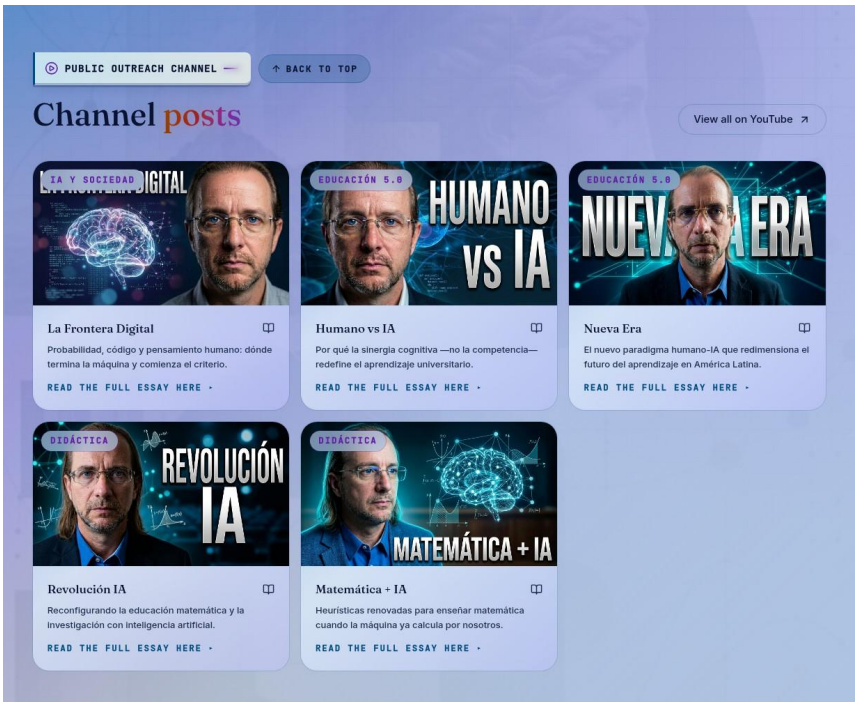
Certified international participation: timeline by year, map by country and downloadable certificates.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 9

Channel posts: short essays with «Read the full essay».



Note. Screenshot of rafael-lorenzo.institute (2026).

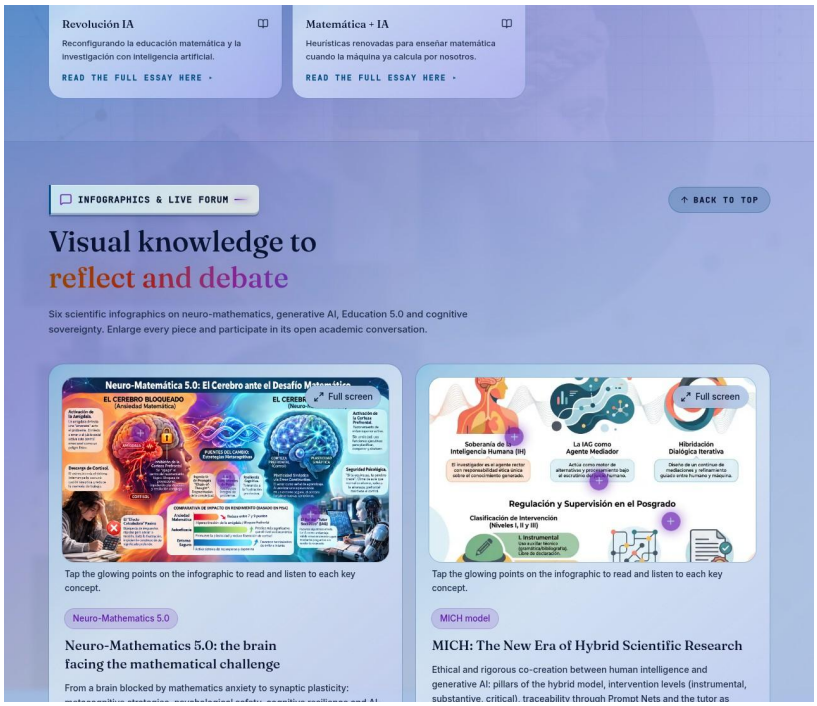
13. Infographics, forum and «Explore with AI»

Infographics are interactive posters: tap the glowing dots to read or listen to each concept.

> **Open forum**
> Any visitor can leave a comment; messages are moderated to keep an academic tone.

Figure 10

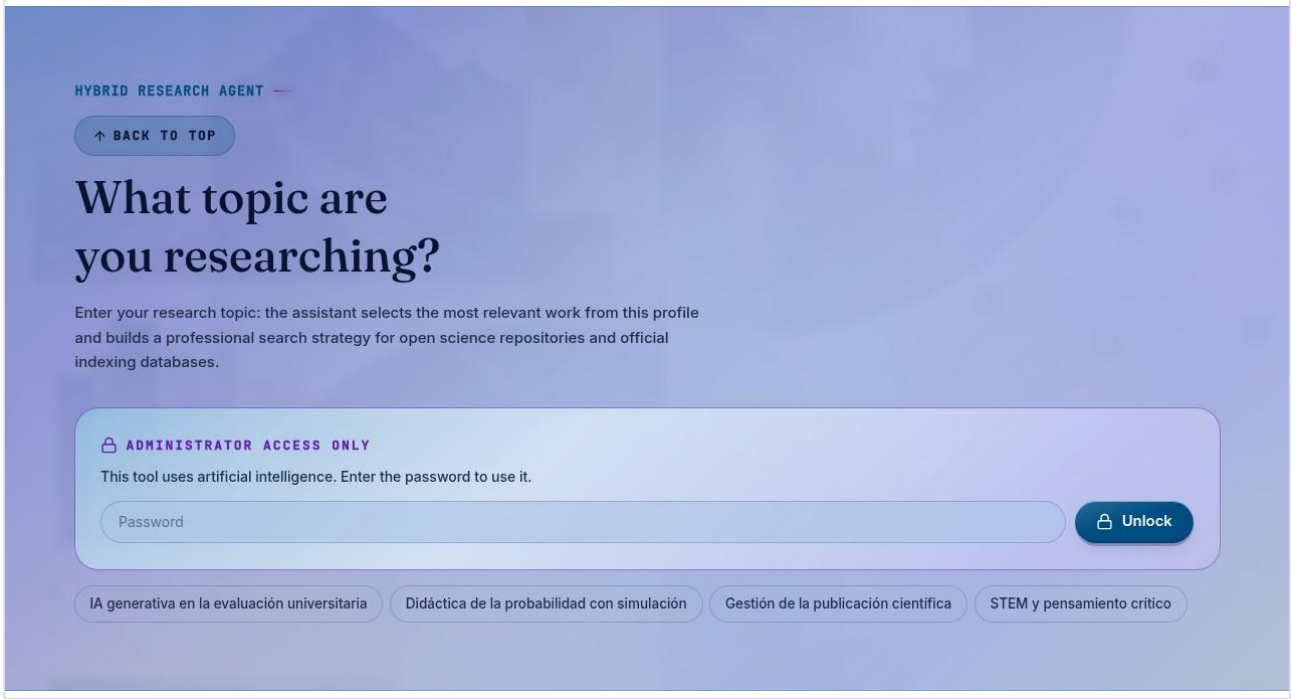
Infographics with «Full screen», «Join the debate», «Debate on LinkedIn» and «Cite».



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 11

«What topic are you researching?»: AI recommender (key required) and suggested topics.



Note. Screenshot of rafael-lorenzo.institute (2026).

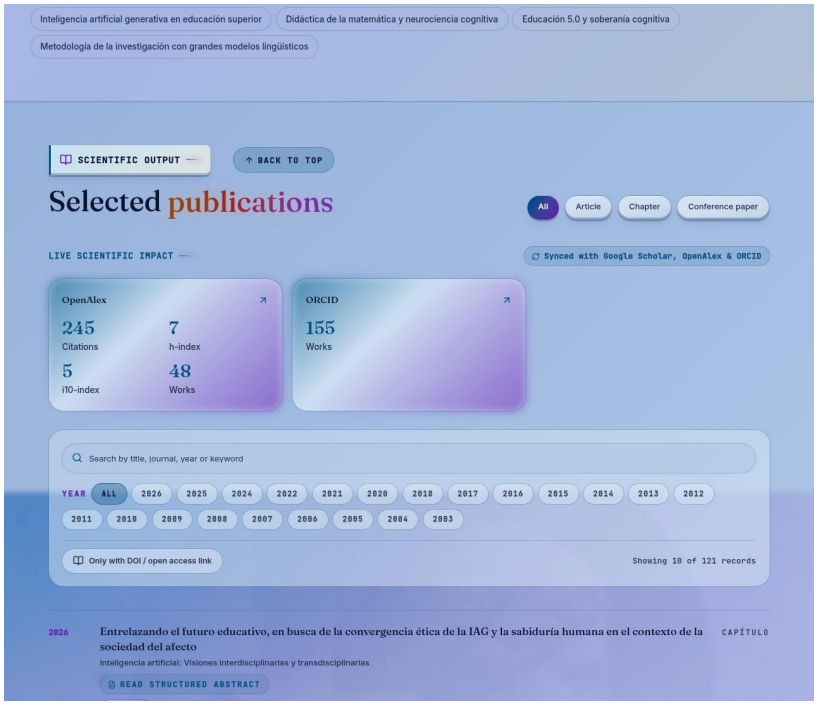
14. Publications and the «Cite» button

Scientific output syncs with ORCID and OpenAlex. Live metrics appear above (citations, h-index, i10-index, works) and the filterable list below.

> **For reference managers**
>
> The .ris file imports directly into Zotero, Mendeley, EndNote or Citavi; BibTeX works with LaTeX and Overleaf.

Figure 12

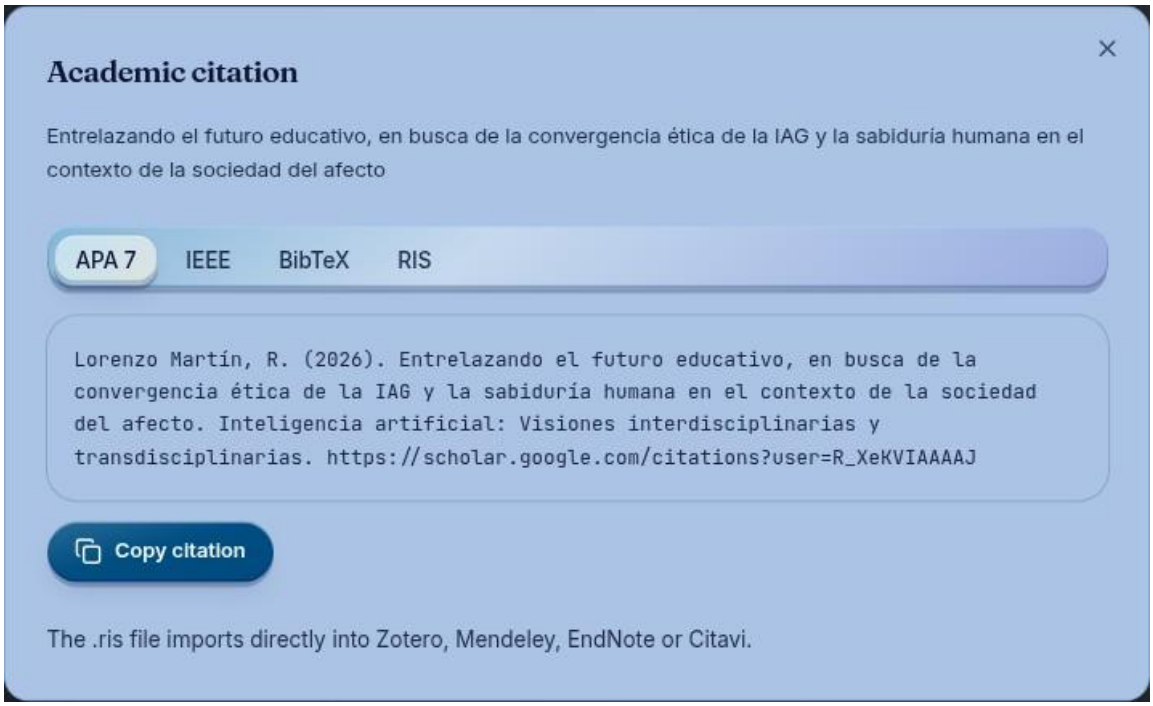
Filters by type (All, Article, Chapter, Paper), by year, search box and «DOI only».



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 13

«Academic citation» window: APA 7, IEEE, BibTeX and RIS, with «Copy citation» and «Download .ris».



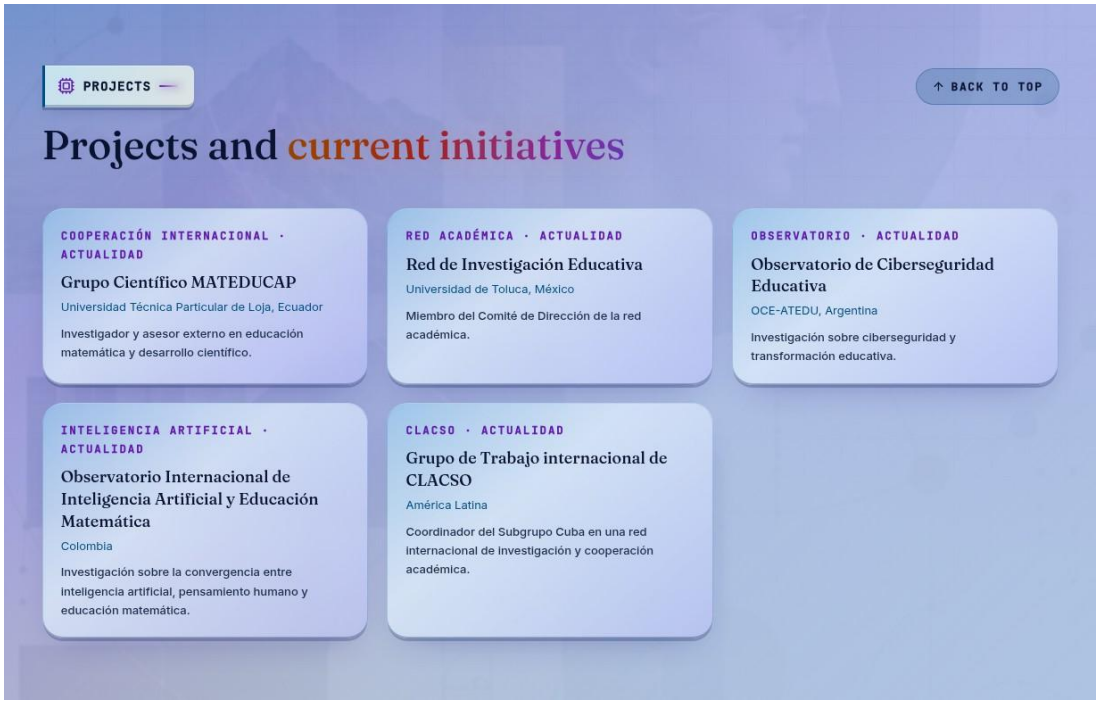
Note. Screenshot of rafael-lorenzo.institute (2026).

15. Projects, newsletter, contact, social and footer

The final part of Home connects with the academic community.

Figure 14

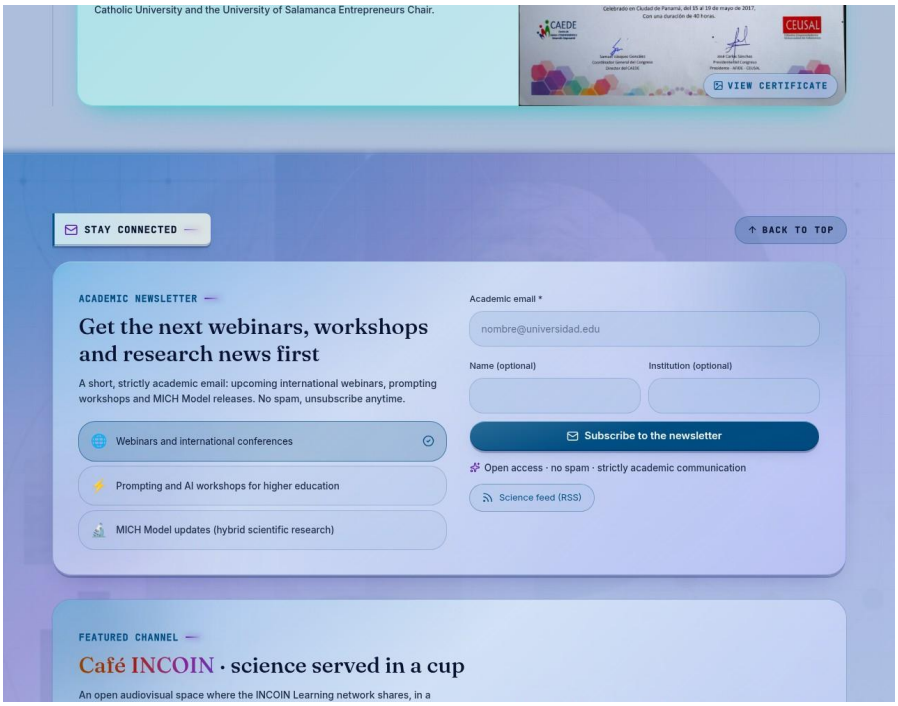
Ongoing projects and initiatives, with institution and role.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 15

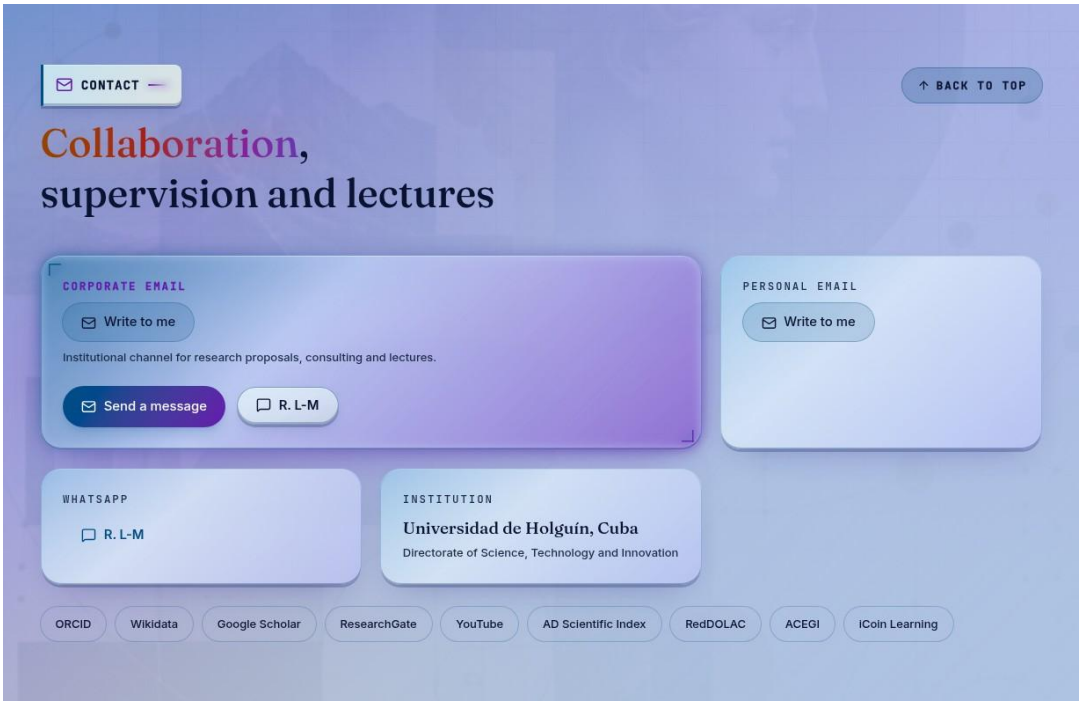
Newsletter: choose topics, leave your academic email and subscribe; there is also an RSS feed.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 16

Contact: «Write to me» and «Send a message» open the form; the personal email is never shown.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 17

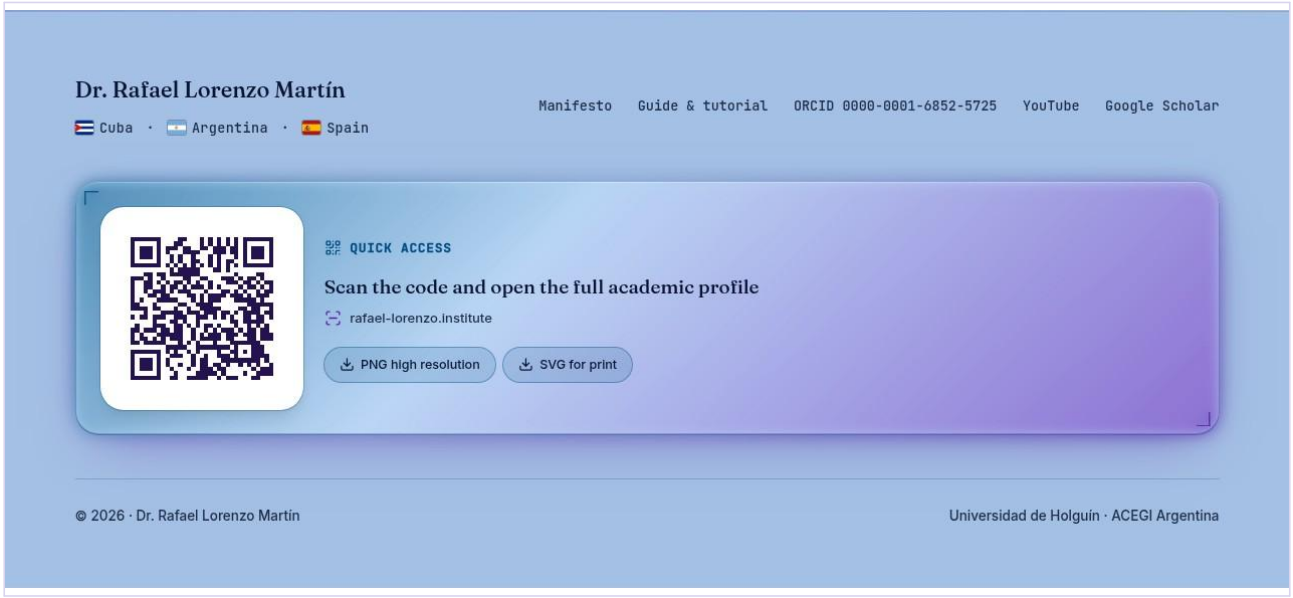
Social networks with QR codes to follow from your phone.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 18

Footer: Manifesto, Guide & tutorial, ORCID, YouTube, Google Scholar and downloadable QR.



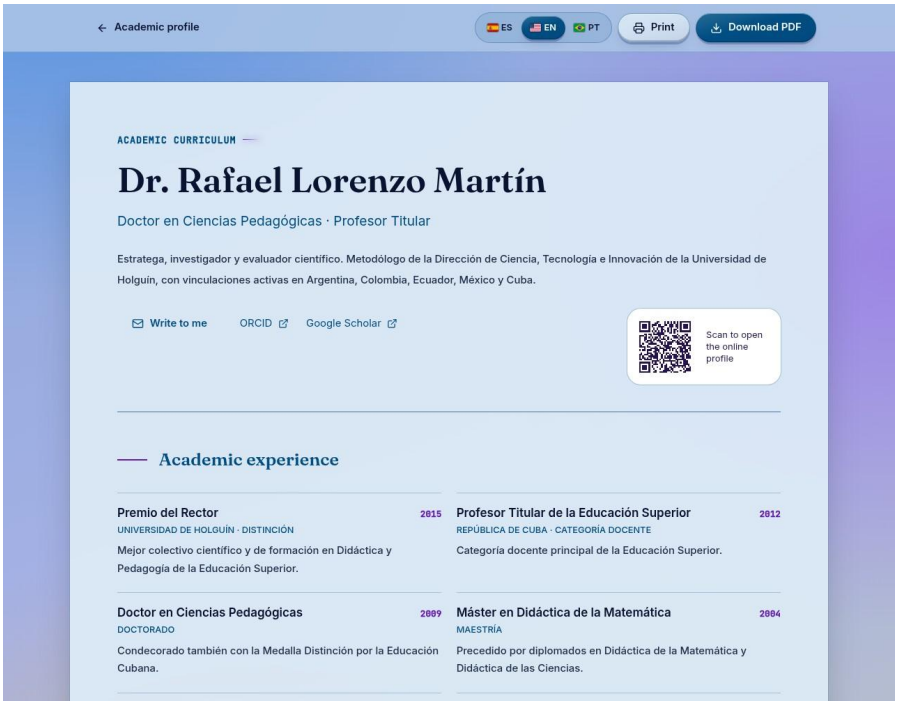
Note. Screenshot of rafael-lorenzo.institute (2026).

16. Separate pages

Each page has its own address, can be shared and keeps the language selector and «Back» link.

Figure 19

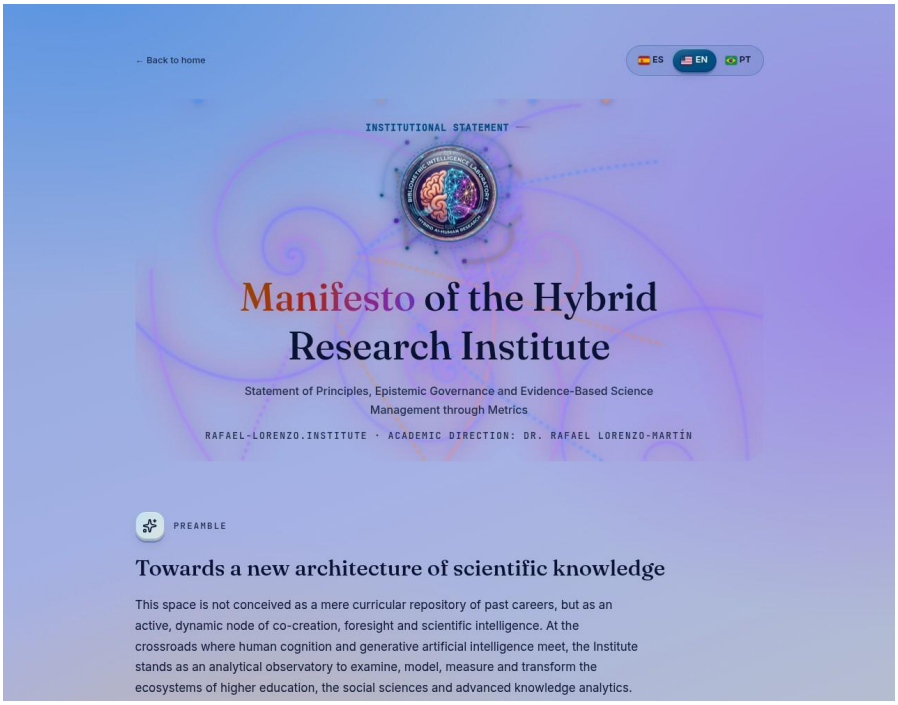
Curriculum: «Print», «Download PDF», QR and full academic career.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 20

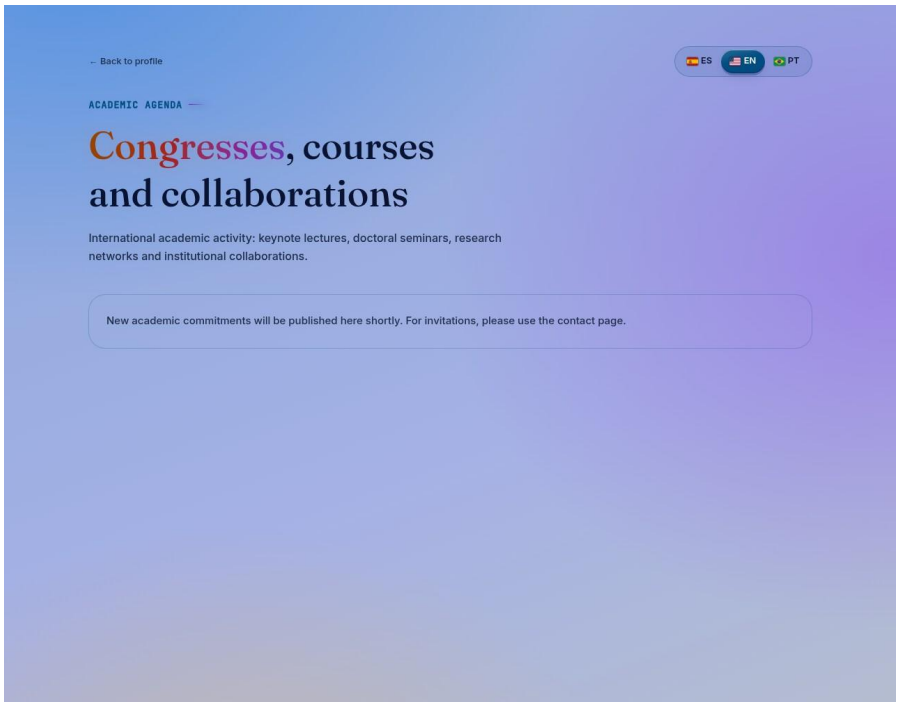
Manifesto of the Hybrid Research Institute.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 21

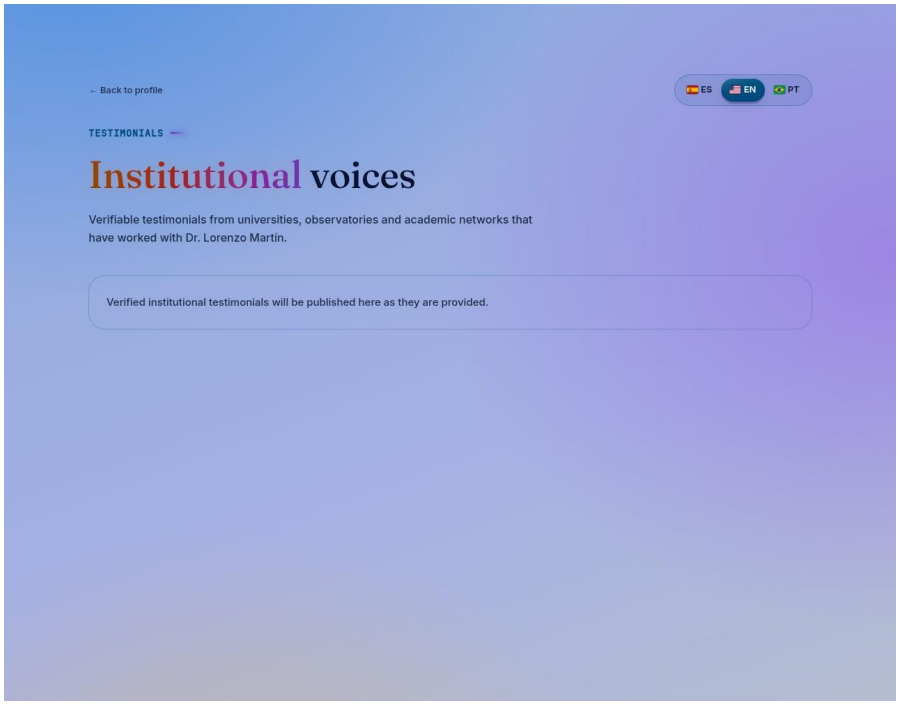
Academic agenda of congresses, courses and collaborations.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 22

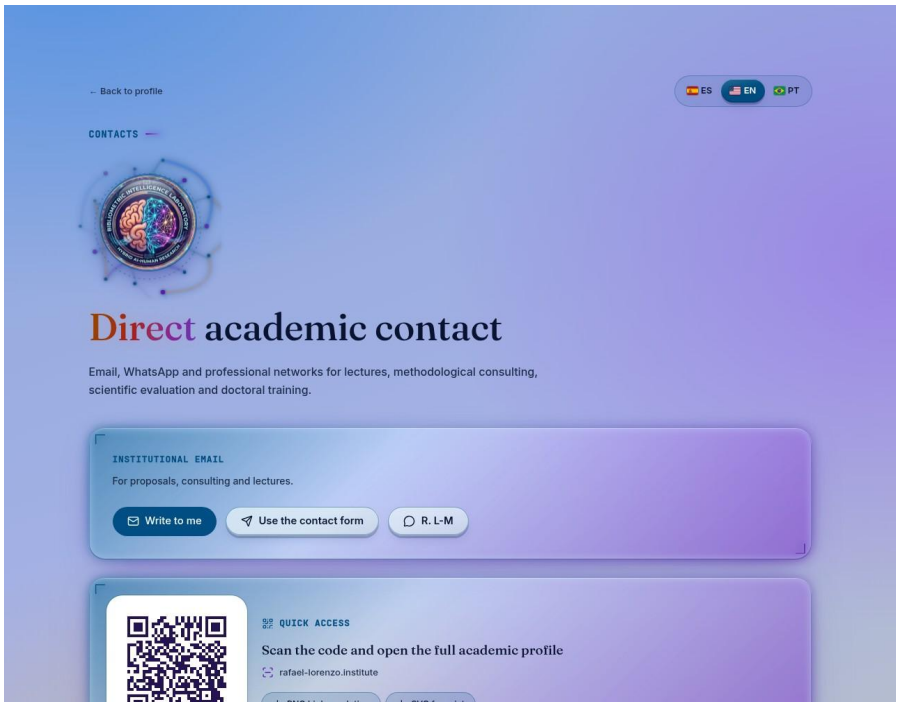
Verifiable institutional testimonials.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 23

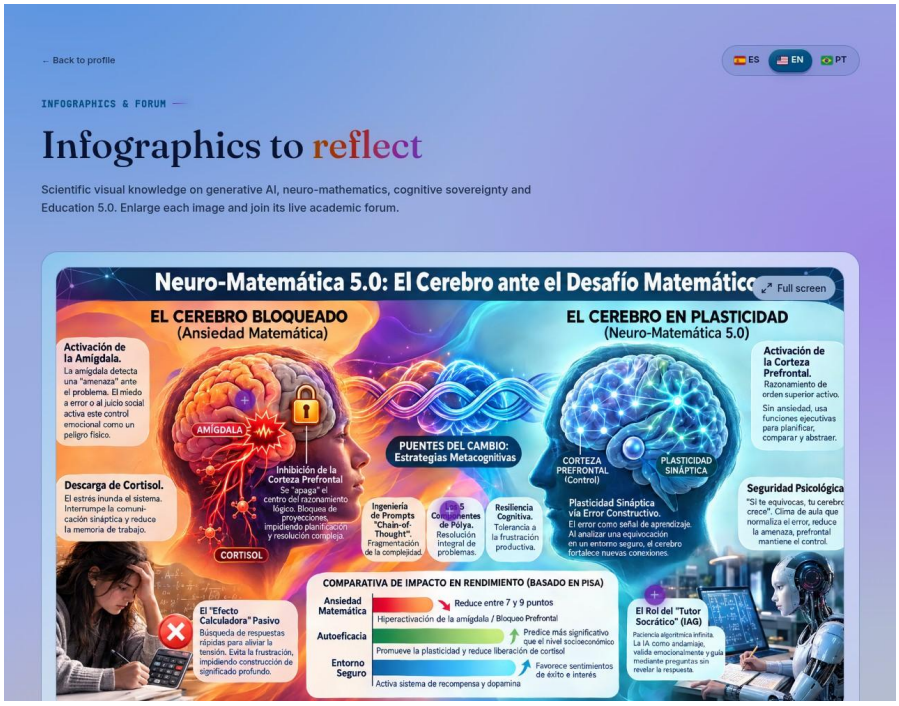
Contacts: institutional email, form and QR access.



Note. Screenshot of rafael-lorenzo.institute (2026).

Figure 24

Full gallery of infographics for reflection.



Note. Screenshot of rafael-lorenzo.institute (2026).

Part III · Inside the Laboratory: modes, tabs and variants

17. The Laboratory step by step

The Laboratory turns a question («what does field X look like?») into a data map. Follow these steps in order.

Step 1 · Choose the mode

Topic only: type the field and the system searches OpenAlex. File only: upload your Web of Science, Scopus or SciELO RIS/CSV and press «Analyse this collection». Hybrid: topic plus file, merged without duplicate DOIs.

Step 2 · Choose the sample size

Agile sample (≈60–80 works) for quick exploration; robust sample (200–400+) for reports. More works give more stability but do not guarantee a high KMO: that depends on how terms relate.

Step 3 · Process

AI-powered functions consume credits, so they require the administrator key. OpenAlex searches and mathematical calculations work without it.

Step 4 · Browse the tabs

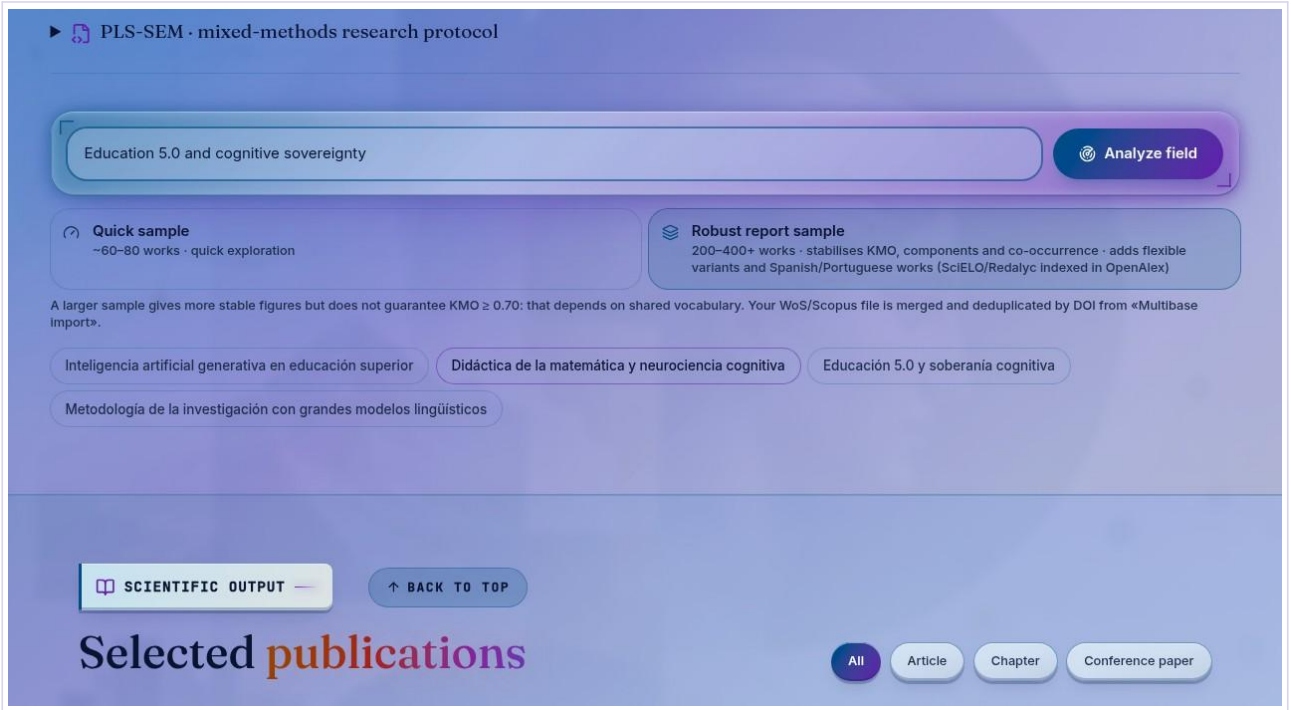
Overview, Epistemic frontier, IPDF, Multilevel factorial, Interactive explorer, Regressions, Cluster network, Timeline, Co-words and gaps, Controversies, Co-authorship, Open science, Comprehensive analysis (PDF) and Export & engines.

Step 5 · Download and cite

Generate the PDF report in Spanish or English, download the corpus and the R script, and use the «Cite» button (APA 7, IEEE, BibTeX, RIS) for each work or for the report with its Query ID (IC).

Tip. write the topic with a few clear concepts. If OpenAlex finds no work with every term at once, the system uses a flexible search (anchor concept + at least one other) and declares it in the report.

Figure 25
Search box with a typed topic, robust sample selected and suggested topics.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

18. The three processing modes

The «Information processing · Choose how to start the analysis engine» block offers three routes with the same rigour. Each card has a «GO →» button that takes you to exactly where that mode is completed.

1 · Topic only (blue)

Type the field in the search box and press «Analyse field». The system builds the OpenAlex query, broadens it with synonyms and Spanish/Portuguese variants if you chose the robust sample, and processes everything.

2 · File only (green)

Open «Multibase import», upload your RIS or CSV and press «Analyse this collection in the Laboratory». The sample will be only the works in your file with a recoverable DOI.

3 · Hybrid (magenta)

Type the topic, upload the file and press «Hybrid mode: merge with the typed topic». Both sources are added without duplicate works and the report states how many each contributed.

Agile or robust sample

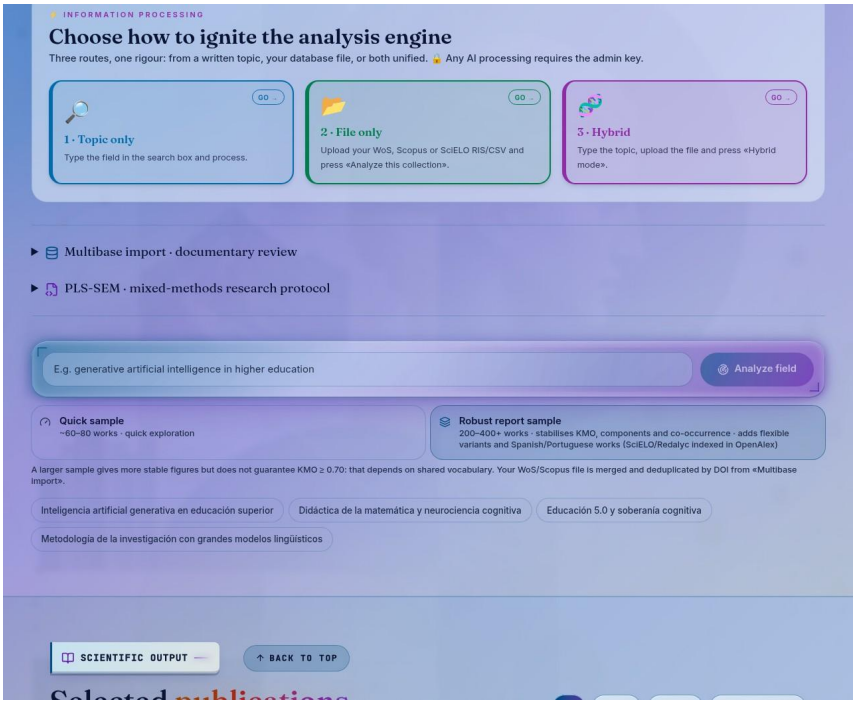
Agile: about 60–80 works, ideal for exploring. Robust: 200–400+ works for a report. More works give steadier figures but do not guarantee KMO ≥ 0.70: that depends on how much vocabulary the works share.

Suggested topics

The chips under the search box load a ready example to practise without writing a query.

Figure 26

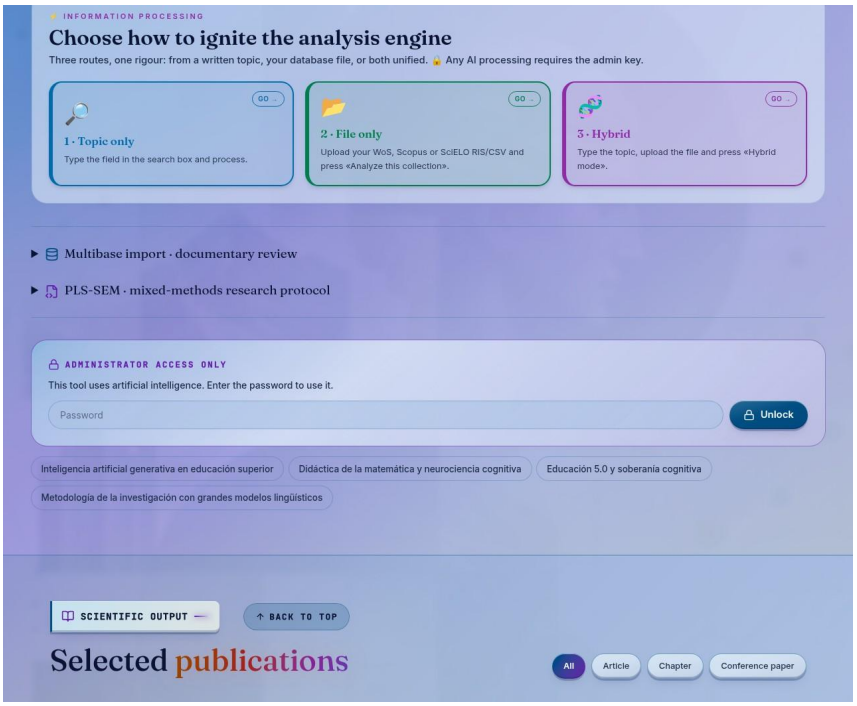
Three modes (blue, green, magenta), «Analyse field» search box, sample selector and suggested topics.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 27

Administration lock: without the key, the AI analysis button stays locked.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

19. Multibase import step by step

This panel reads exports from Web of Science (savedrecs.ris), Scopus or SciELO. The file is processed in your browser and never uploaded; only if you ask to integrate it are its DOIs looked up in OpenAlex.

1 · Declare the source and pick the file

Choose WoS, Scopus or SciELO in the menu and press «Choose CSV or RIS». You declare the source: the file does not certify it.

2 · Read the audit

Valid records, identity groups, duplicates, title matches to review and conflicts. Each rejection shows the row and reason (missing title, invalid year).

3 · Choose the action

«Export records» and «Export audit» (CSV), «Analyse this collection», «Hybrid mode» or «Integrate works into the active corpus via OpenAlex». The bin icon removes the file.

Merging rules

Only identical DOIs or same-source identifiers are grouped. Matching title and year remain candidates, never merged automatically. Citations from different databases are never added.

DOI cleaning

DOIs with prefixes, spaces or extra signs are normalised automatically. Records without DOI are not lost: they stay for review, although they cannot be looked up in OpenAlex.

Merging without duplicates

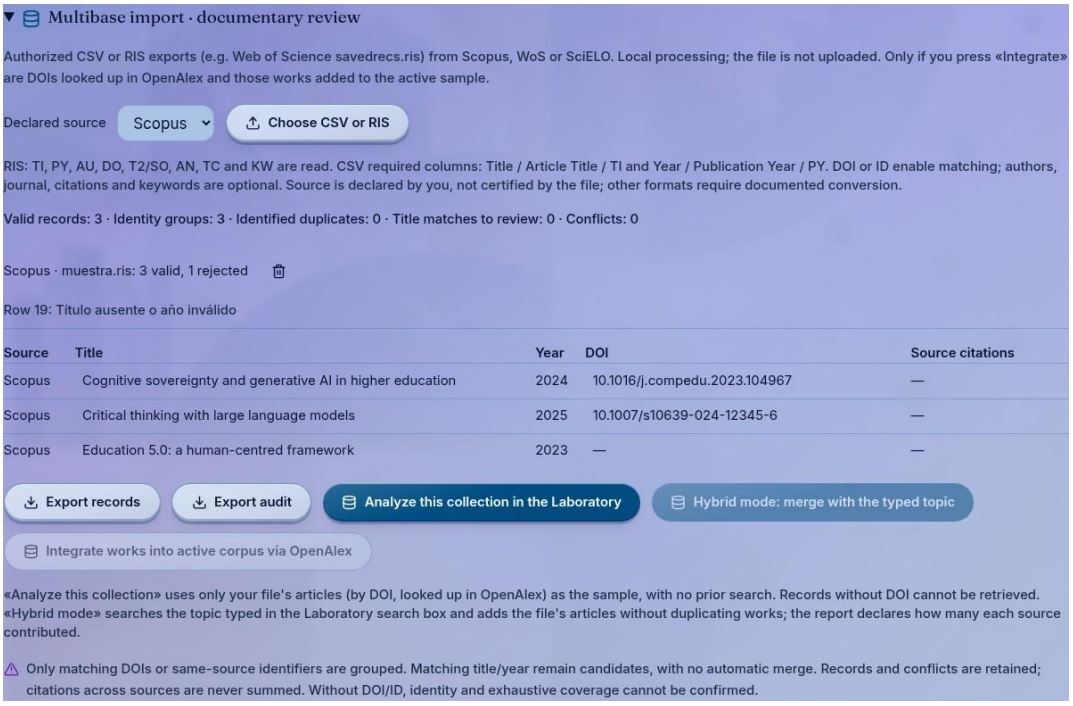
In hybrid mode, file works and OpenAlex works are joined by DOI: the same article is never counted twice. Citations from different databases are not added together.

If you reload the page

The collection is kept during the browser session. If it is lost (for instance after closing the tab), the system tells you to import the file again.

Figure 28

Declared source, «Choose CSV or RIS», audit (valid, rejected, duplicates, conflicts), record table and action buttons.



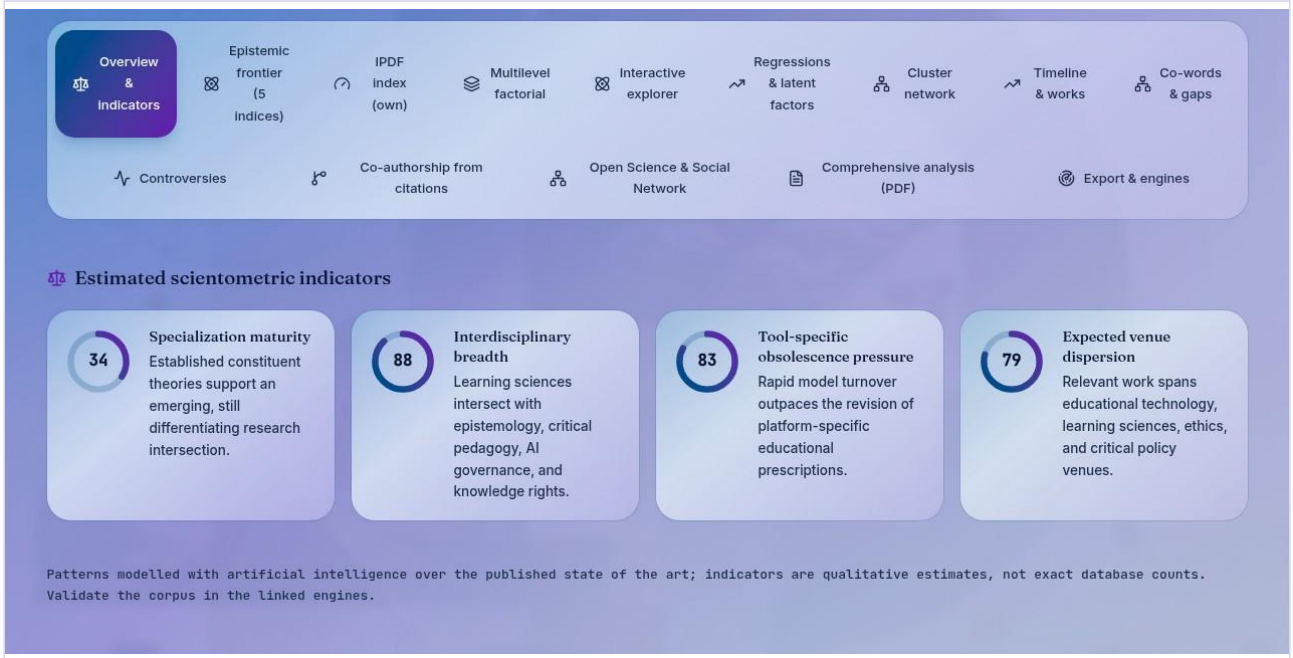
Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

20. The results dashboard: the 14 tabs

When the analysis finishes a tab bar appears. The active tab glows in a blue-violet gradient. There are two kinds of content worth telling apart: what is calculated from real OpenAlex works (no AI cost) and what is estimated with AI about the state of the art (indicative).

Figure 29

Tab bar and «Overview & indicators»: four estimated gauges with their reading. The note below states they are qualitative estimates.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Tab	What it answers	Source
Overview & indicators	How mature, interdisciplinary and fast is the field?	AI · estimate
Epistemic frontier (5 indices)	Disruption, friction, acceleration, resilience and gaps against a horizon	AI · estimate
IPDF index (in-house)	What rupture potential does each theme have? (LORMAR Number)	Mixed
Multilevel factorial	MCA plane, ERL maturity and Shannon entropy by macro, meso and micro layers	Mixed
Interactive explorer	Hemisphere spectrum with zoom and works with metadata and «Cite»	OpenAlex
Regressions & latent factors	Growth (Price), doubling, KMO, half-life, concentration	OpenAlex · calculation
Cluster network	Thematic communities, bridge terms, frontier and dendrogram	AI · structure
Timeline & works	Field milestones and key works	Mixed
Co-words & gaps	Which terms appear together and where are links missing?	OpenAlex · calculation

Tab	What it answers	Source
Controversies	Open debates and conflicting positions	AI · estimate
Co-authorship from citations	Who collaborates with whom?	OpenAlex · calculation
Open Science & Social Network	Access routes, institutions, countries and bibliographic coupling	OpenAlex · calculation
Comprehensive analysis (PDF)	Full downloadable report in Spanish and English	All of the above
Export & engines	Boolean equation, VOSviewer query, R script and downloads	OpenAlex

Tip. it says whether the result is a calculation, an estimate or a hypothesis.

21. Frontier tabs: 5 indices, IPDF and factorial

These three tabs answer «where is the field's frontier and how much potential for change does it have?».

How to read the bars

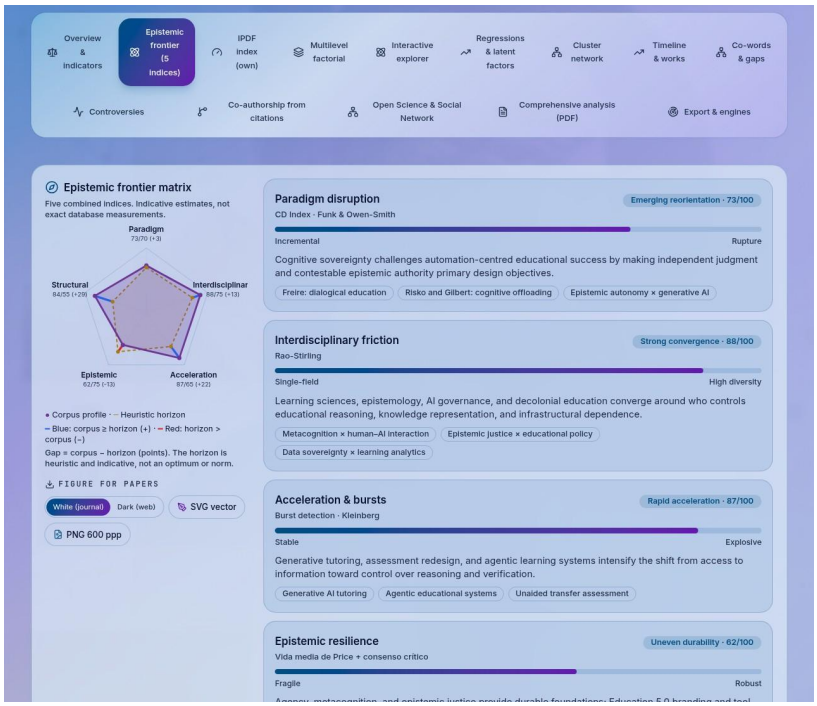
Each index runs from one end to the other (Incremental → Rupture, Stable → Explosive). The label on the right summarises the level (e.g. «Intense convergence · 88/100»).

Factorial plane buttons

«Interactive» enables zoom, pan and hover detail; «Static» shows the publication version. The MACRO/MESO/MICRO chips turn each layer on or off.

Figure 30

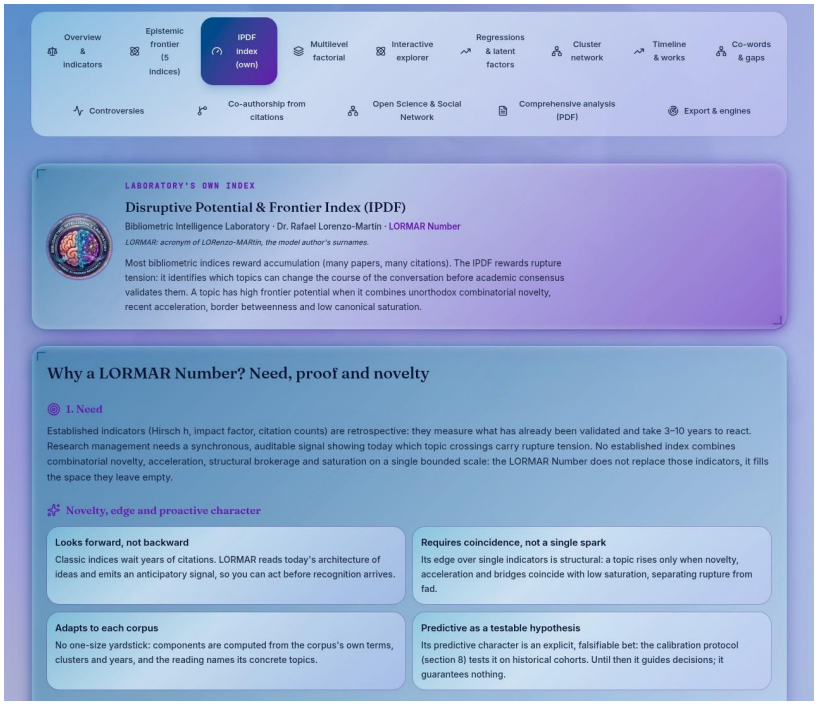
Epistemic frontier matrix: dual radar (corpus vs. horizon), 0–100 bars with their reading and associated topics.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 31

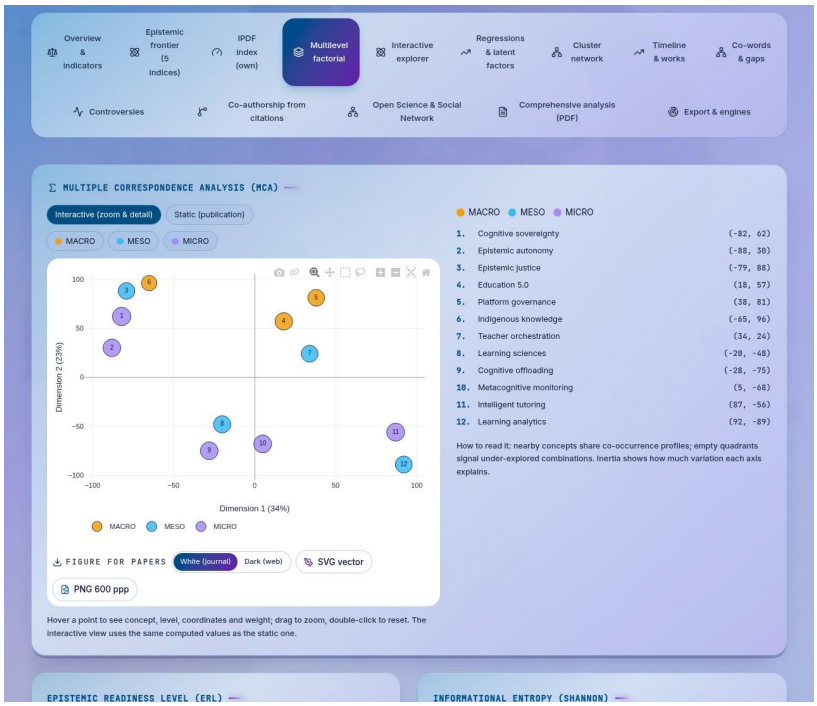
IPDF index: need, novelty, advantage and proactive nature of the LORMAR Number.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 32

Multilevel factorial: interactive MCA plane (zoom and detail) or static (publication), MACRO, MESO and MICRO layers.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

22. Structure tabs: regressions, networks and co-words

Here the Laboratory counts and calculates on real works. These are the strongest tabs for grounding a state of the art.

R², doubling and KMO

R² shows how well the curve fits the data (1 = perfect). Doubling time says in how many years output doubles. An orange KMO (< 0.60) warns that factor analysis must be read with caution.

Co-word sliders

«Terms» sets how many words enter the map; «Minimum frequency», how many works must share a term to show it. Raising frequency removes noise; lowering it reveals rare topics.

Figure 33

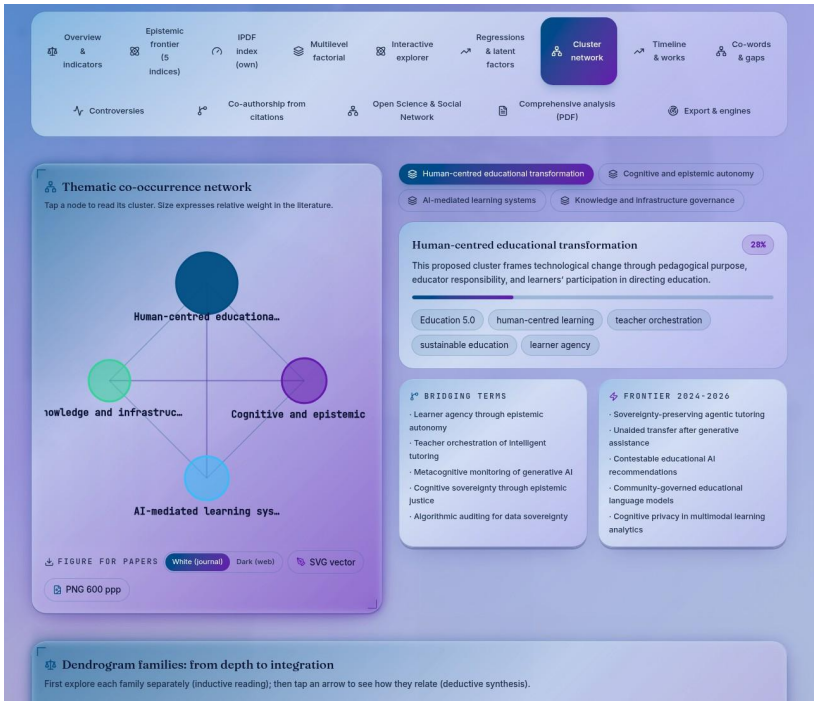
Regressions: exponential, logistic and linear fit with R², projection with 95% confidence interval, KMO and half-life.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 34

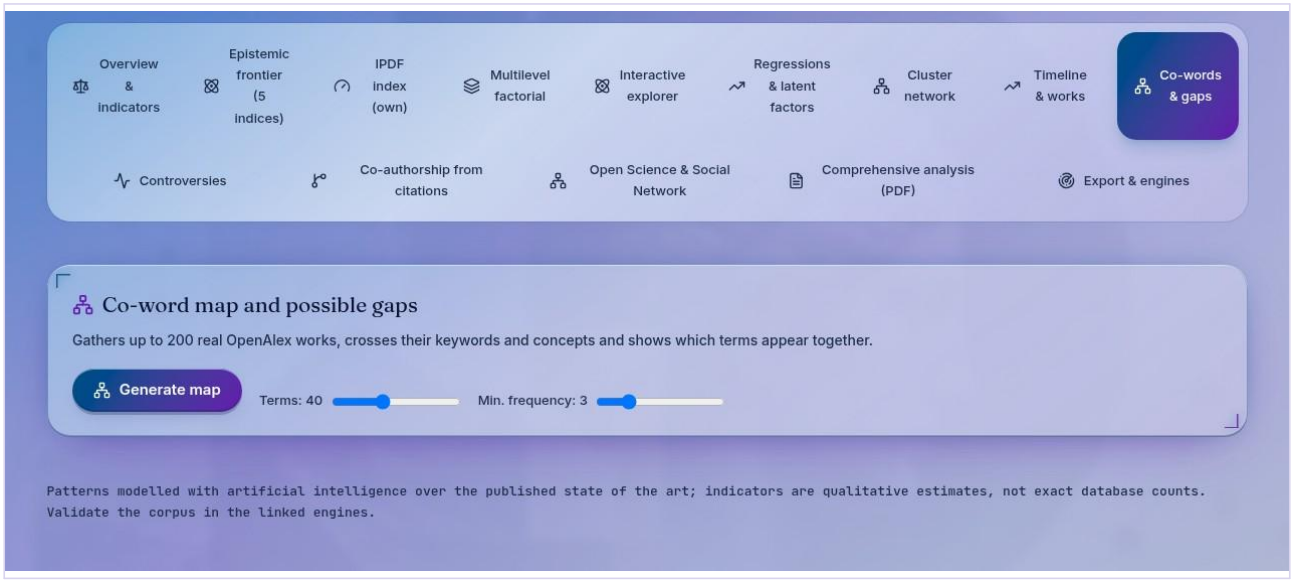
Co-occurrence network: tap a node to read its cluster; on the right, bridge terms and 2024–2026 frontier.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 35

Co-words: «Generate map» with the Terms and Minimum frequency sliders.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

23. Social tabs: co-authorship, open science and controversies

They show who produces knowledge, how it is accessed and where debate lies.

«Minimum shared»

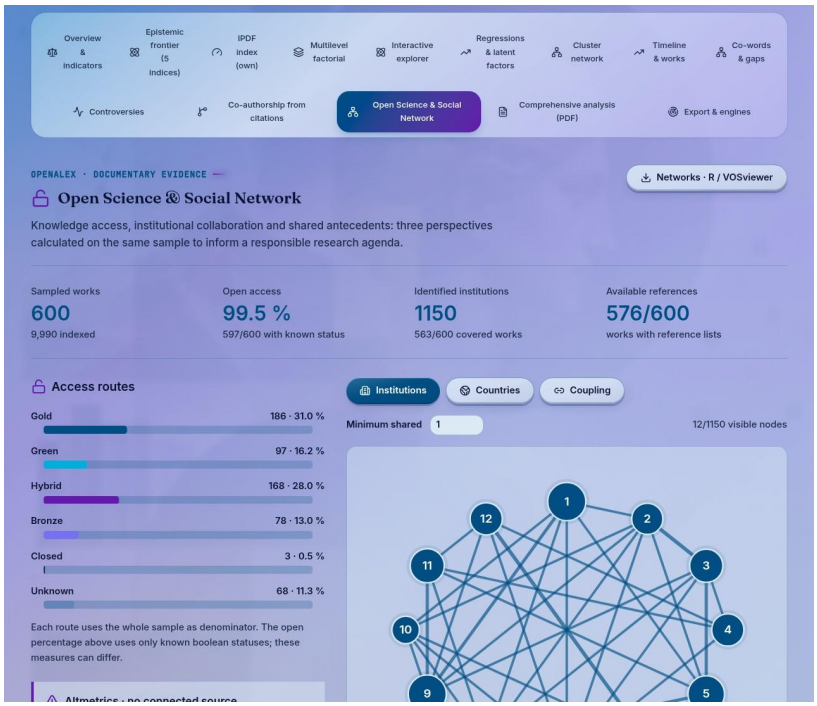
Filters the network: only links with at least that many shared works are shown. The «12/363 visible nodes» counter shows how much of the total is displayed; exports always keep everything.

«No data» is not «closed»

When OpenAlex does not report the access route, the work stays as «No data». Altmetrics are marked «no source connected» instead of being invented.

Figure 36

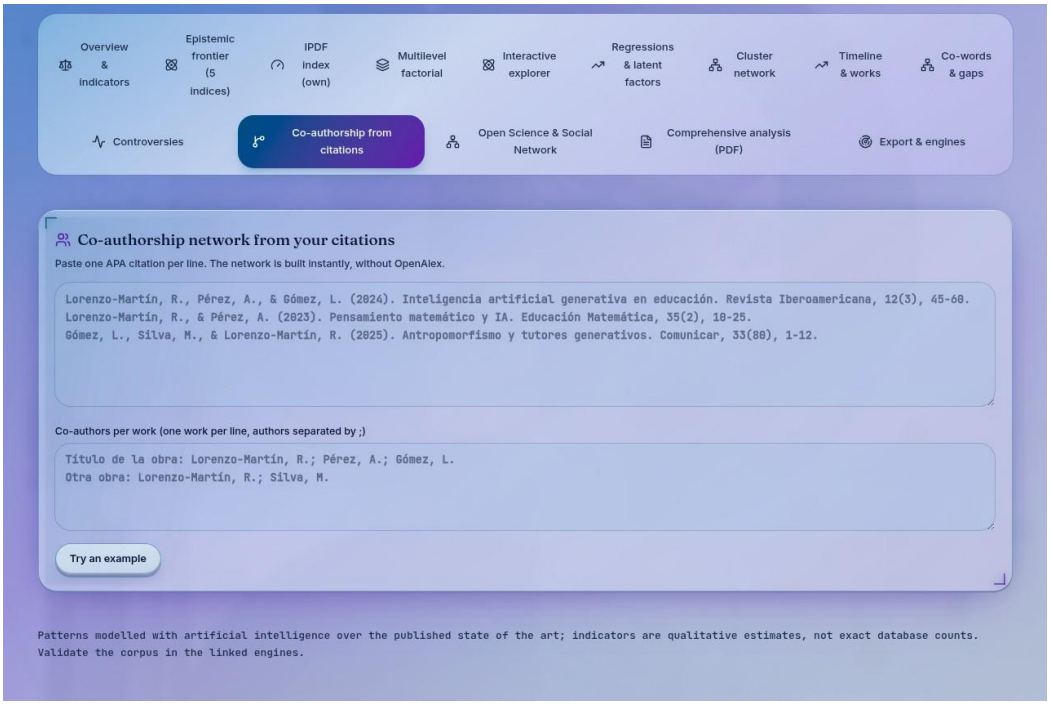
Open Science: works, open access, institutions, references; Gold/Green/Hybrid/Bronze/Closed routes and network with Institutions · Countries · Coupling buttons.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 37

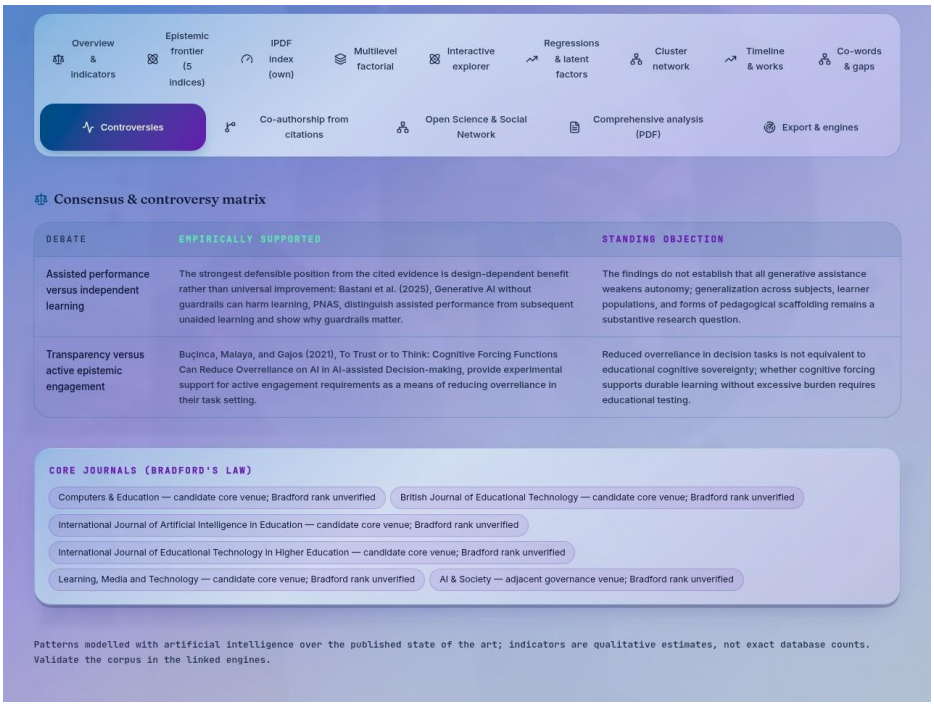
Co-authorship from citations: network of authors who co-sign in the sample.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 38

Controversies: the field's open debates and their positions.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

24. Interactive explorer, M.I.C.H. assistant and journal expansion

Three tools to go deeper after the first analysis.

Work cards

In the Explorer, each work shows authors, year, journal, DOI and abstract (when OpenAlex has it) and a «Cite» button. Quartile is not shown because it requires SJR or JCR.

The assistant proposes, you decide

Generated text is a draft based only on the corpus. It does not validate findings: check every claim against the works.

Figure 39

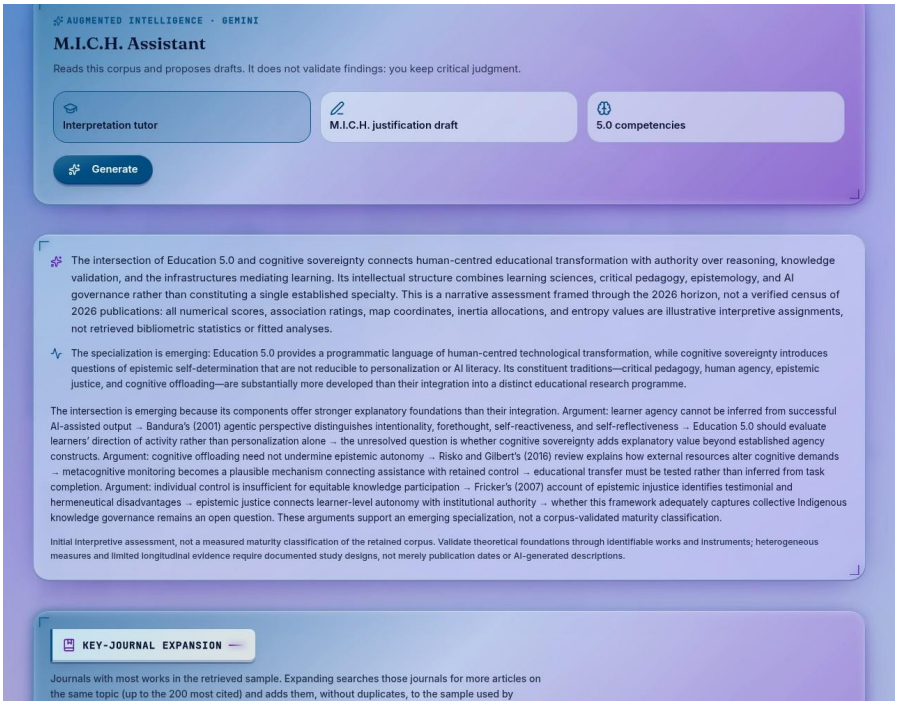
Interactive explorer: hemisphere spectrum with zoom; gold rings mark high bridge potential.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 40

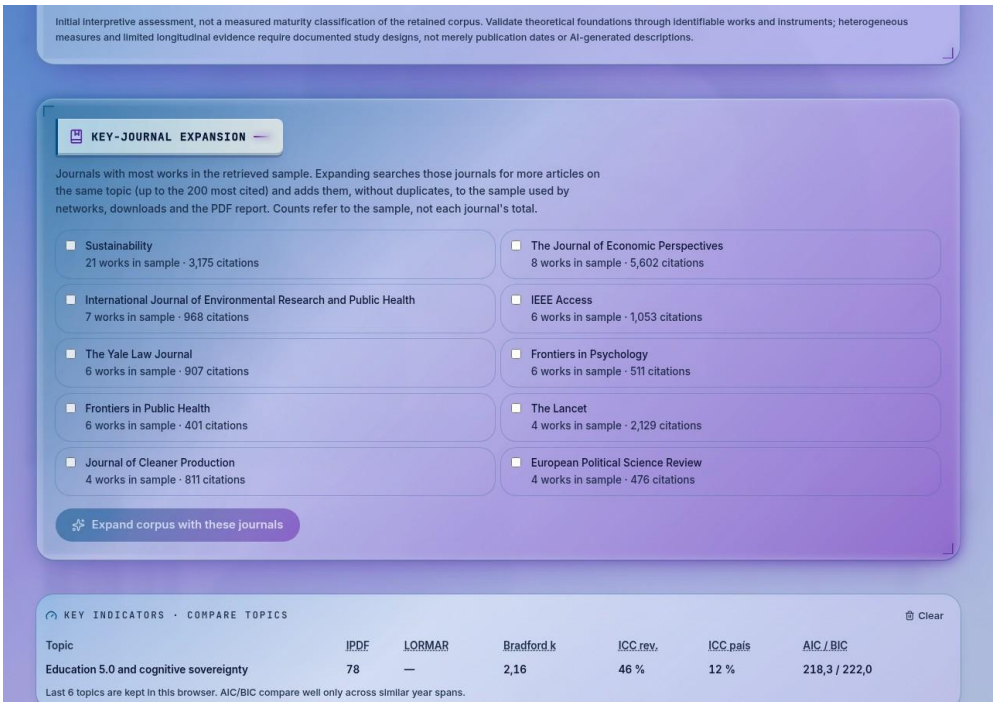
M.I.C.H. assistant: Interpretation tutor, M.I.C.H. justification and 5.0 competencies, with the «Generate» button.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 41

Key journal expansion: adds up to 200 more works from the most present journals, without duplicates.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

25. Interface variants, links and dynamic features

The Laboratory changes appearance by device, language and preferences, without altering the data.

Computer and phone

On large screens tabs appear in two rows and figures next to their explanation; on phones everything stacks in a single column for thumb reading.

Interactive or static

Heavy charts load only when you open their tab, keeping the site fast. Both modes use the same calculated values.

White (journal) or dark (web) background

The «Figure for article» bar lets you choose the background before downloading.

Session memory and cache

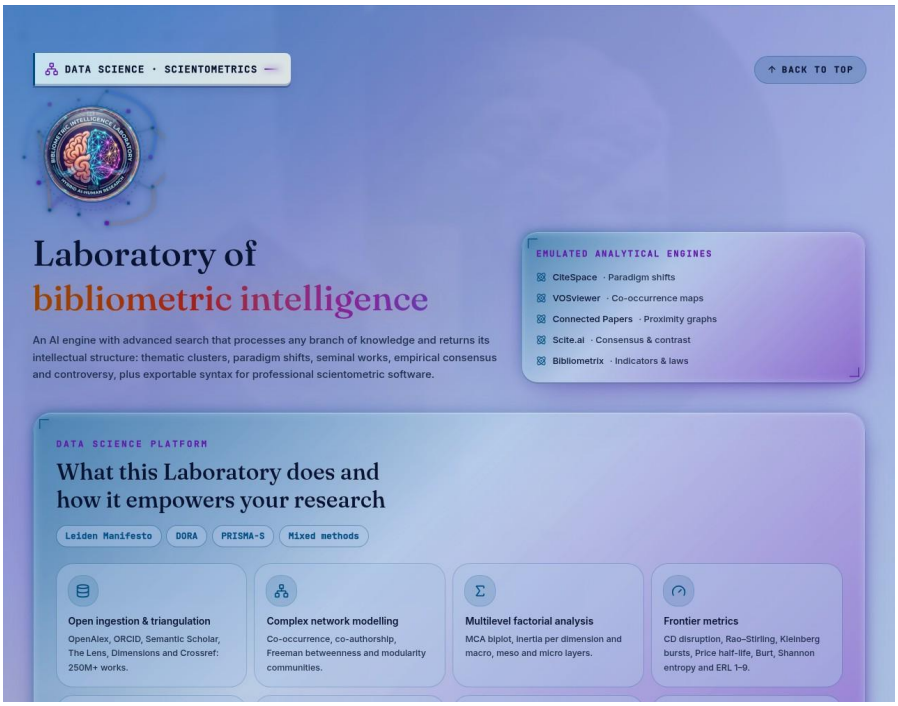
The imported collection and the last analysis are kept while the tab is open; a repeated analysis of the same topic and language can be reused for 30 days in your browser.

External links

DOIs open the original work; ORCID, OpenAlex, VOSviewer, bibliometrix and RStudio open in a new tab so you don't lose your analysis.

Figure 42

Laboratory introduction with standards tags (Leiden, DORA, PRISMA-S, mixed approach).



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 43

«What this Laboratory does»: eight capabilities, from open ingestion to editorial output.



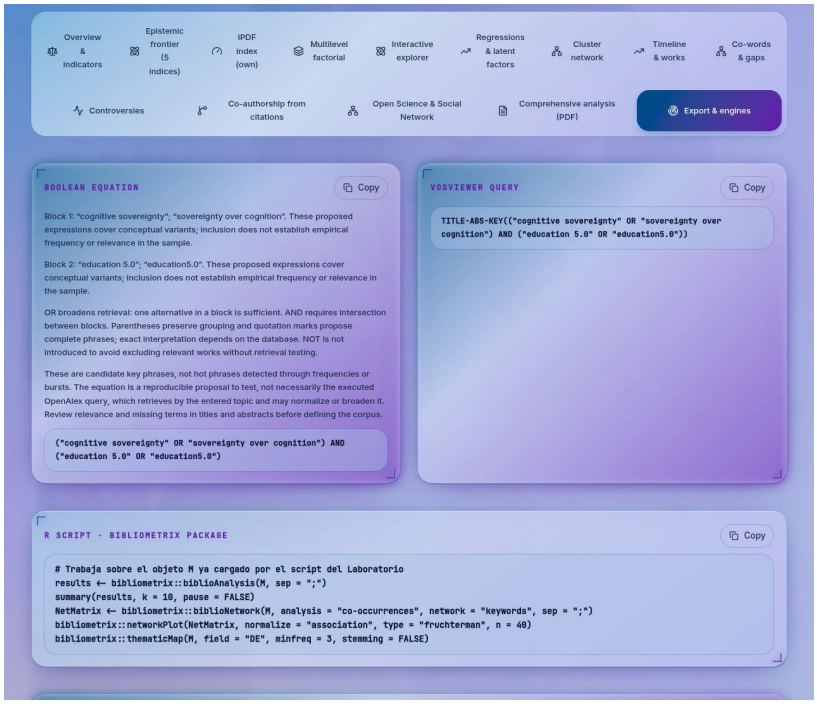
Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Part IV · Results: figures, files, reports and method

26. Everything you can save: images, data, scripts and reports

Every Laboratory result can be taken outside the site in a standard format. This table summarises which file you get, from where and what it is for.

Figure 44
«Export & engines»: Boolean equation, VOSviewer query and bibliometrix script snippet, each with «Copy».



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

File	Where you get it	What it is for
Vector SVG figure	«Figure for article» bar under each chart	Edit in Illustrator, CorelDRAW or Inkscape without losing sharpness
600 dpi PNG figure	Same bar; white or dark background	Insert in articles, theses or slides at print quality
Interactive chart snapshot	Camera icon on the chart toolbar	Save the exact view after zooming

File	Where you get it	What it is for
OpenAlex corpus (.csv)	«Export & engines»	Up to 400 deduplicated works with authors, institutions, countries, references and open access; loads in bibliometrix
R script (.R)	«Export & engines»	Repeats the full analysis in RStudio (networks, Callon, Bradford, Lotka, KMO, factors, multilevel) and saves its own CSV tables
LORMAR calibration (.R)	«Export & engines»	Test the index on a historical cohort (logistic, multilevel, Cox, PLS-SEM)
R / VOSviewer networks (.zip)	«Export & engines» or «Open Science»	Complete institutions, countries and coupling, including isolated nodes
Analysis summary (.csv)	«Export & engines»	Indicators and clusters to read or keep (not for bibliometrix)
Excel spreadsheet (.xls)	«Export & engines»	Open the summary directly in Excel, LibreOffice or Google Sheets
Records and audit (.csv)	«Multibase import»	Keep the provenance of your WoS/Scopus/SciELO file
Boolean equation and VOSviewer query	«Copy» button in «Export & engines»	Paste into Scopus, WoS or VOSviewer and repeat the search
APA 7 · IEEE · BibTeX · RIS citation	«Cite» button on works, infographics, publications and report	Bring the reference into Zotero, Mendeley, EndNote or LaTeX
Comprehensive report (.pdf)	«Comprehensive analysis (PDF)» · «Download PDF report (ES + EN)»	Vector A4 APA 7 document for committees, mentors or annexes
QR code (.png / .svg)	Footer, Curriculum and Contacts	Share the site on posters, badges or slides

RStudio workflow in five steps

1) Analyse the topic. 2) Download the corpus (optional). 3) Download the .R script: it already includes the corpus. 4) Double-click it and press «Source» (Ctrl+Shift+S). 5) Charts, networks and biblioshiny open by themselves. The first time, install bibliometrix and Plotly with the lines shown on the site.

Do not open the CSV in Excel before R

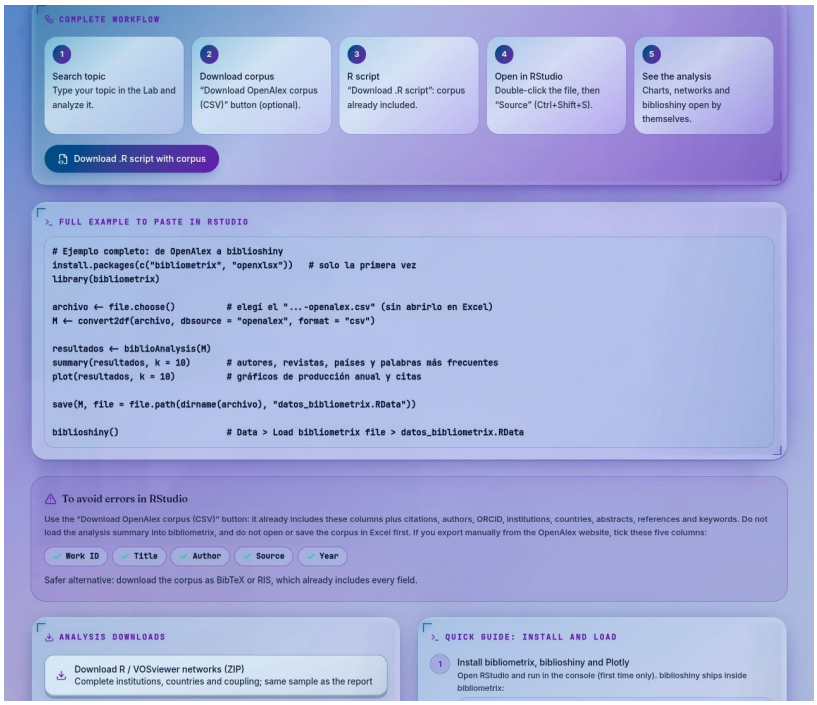
Excel may alter accents and separators. To read it as a spreadsheet, use the Excel download.

If the download does not start

The notice «File ready… click here to save» appears. Some mobile browsers block automatic downloads.

Figure 45

Complete workflow and download buttons: ZIP networks, .R script, CSV corpus, LORMAR calibration, CSV summary and Excel.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

27. Export & engines: R, bibliometrix and VOSviewer

Everything you see can be repeated outside the site. That is the basis of reproducibility.

OpenAlex corpus

CSV with bibliometrix's mandatory columns (Work ID, Title, Author, Source, Year), plus BibTeX and RIS.

R script

A ready-to-run .R file for RStudio that downloads the same query and recalculates networks, clusters and factors. If R shows «non-finite location and/or size», a field is usually missing (e.g. corresponding author or years): filter those records before plotting.

LORMAR calibration

Script that builds a historical cohort, compares theoretical and empirical weights and evaluates out of sample. Results depend on the cohort and are not automatically included in the report.

28. How to read the main figures

Each figure answers a different question. Read the title and the APA note below first: they say what each colour, size and line means.

Cluster network

Circles = themes; lines = shared vocabulary. A highly connected theme is central; an isolated one may be a niche or frontier. Lines show co-occurrence, not cause.

Callon quadrants (strategic map)

Centrality (how much it connects to other themes) versus density (how cohesive it is). Motor themes top right; niches top left; emerging or declining bottom left; basic bottom right.

Dual two-pentagon radar

Compares the Corpus with an indicative Horizon. Blue segment: the corpus reaches or exceeds the horizon; red: the horizon is higher. The horizon is a heuristic reference, not an optimum or a norm.

Hemisphere spectrum

Places each theme by its share of technological vocabulary: left, the subject, cognition and ethics; right, the algorithm. The central golden band is the contact frontier where bridges often emerge. You can zoom in the Interactive explorer.

Factorial plane (MCA) and dendrogram

Nearby terms appear together in the same documents. The dendrogram is a tree: branches joining low are very similar. Exact calculations use the R script.

Heat map and Burt's structural holes

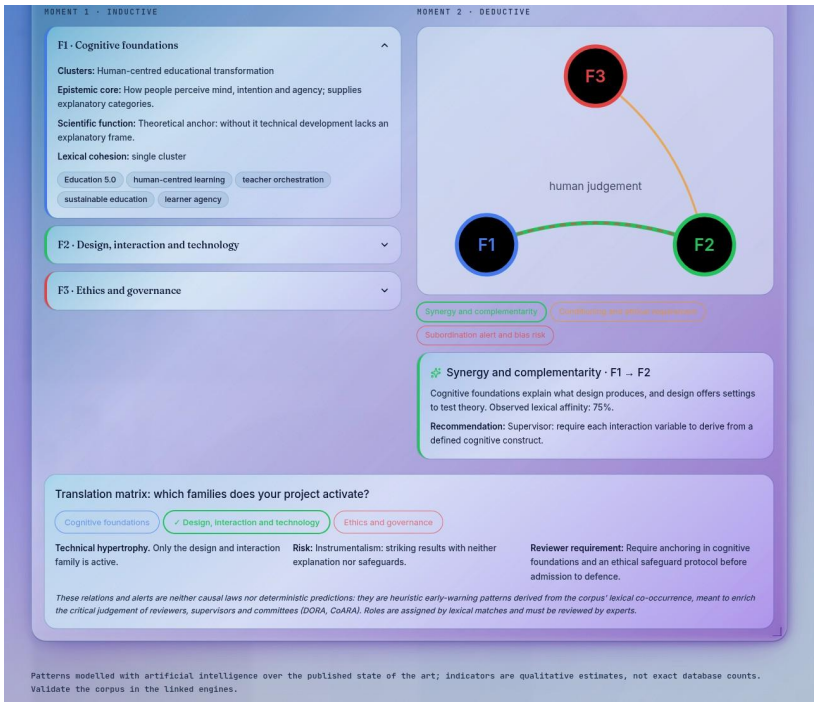
Warm colours = more activity or dialogue; cold = little contact. A cold cell between two hot themes suggests a structural hole: an opportunity to verify, not a guarantee of novelty or impact.

Boolean algebra and KMO

Boolean rules combine conditions (AND, OR, NOT) to classify field states. KMO indicates whether terms share enough structure for factor analysis: below 0.50 is weak; an unavailable KMO is not zero.

Figure 46

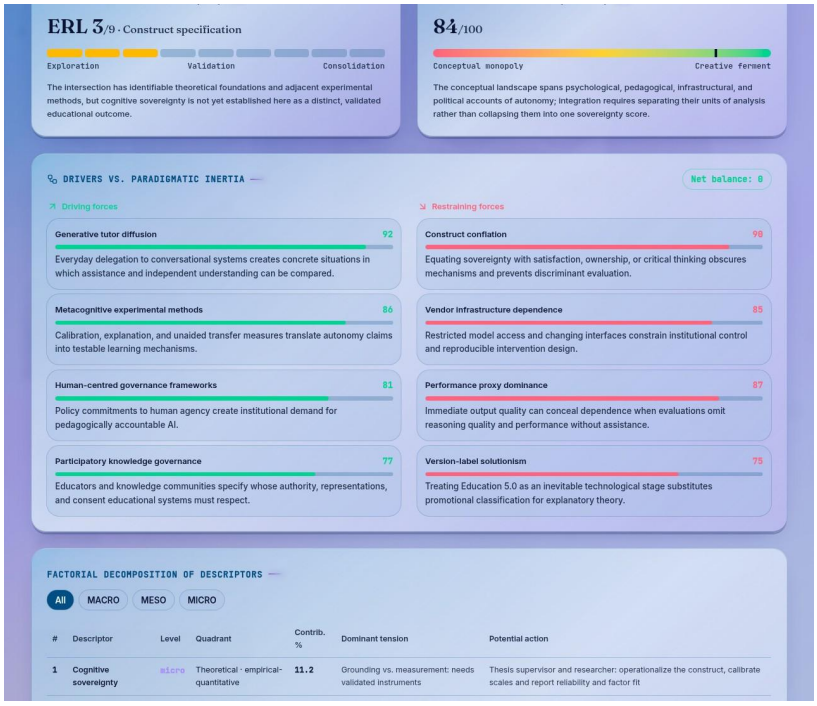
Dendrogram families: inductive reading (each family) and deductive reading (F1–F2–F3 relations around human judgement).



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 47

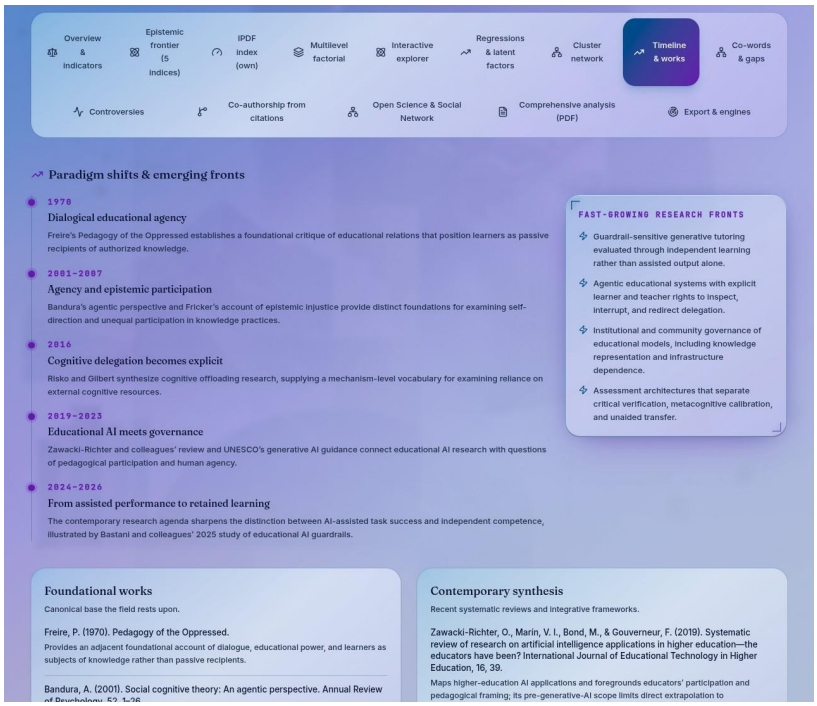
ERL, Shannon entropy, drivers versus brakes and factor decomposition by level.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

Figure 48

Timeline: paradigm shifts, fast-growing fronts, foundational works and contemporary synthesis.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

29. The LORMAR Number (IPDF)

It is the Institute's own index to estimate a field's disruptive and frontier potential. It combines four components into a 0–100 value.

The four components

Nc (conceptual novelty), Mt (thematic acceleration), Be (bridges between communities) push upward; Sk (saturation or concentration) holds back. Each is standardised and combined in a logistic function.

How to read the value

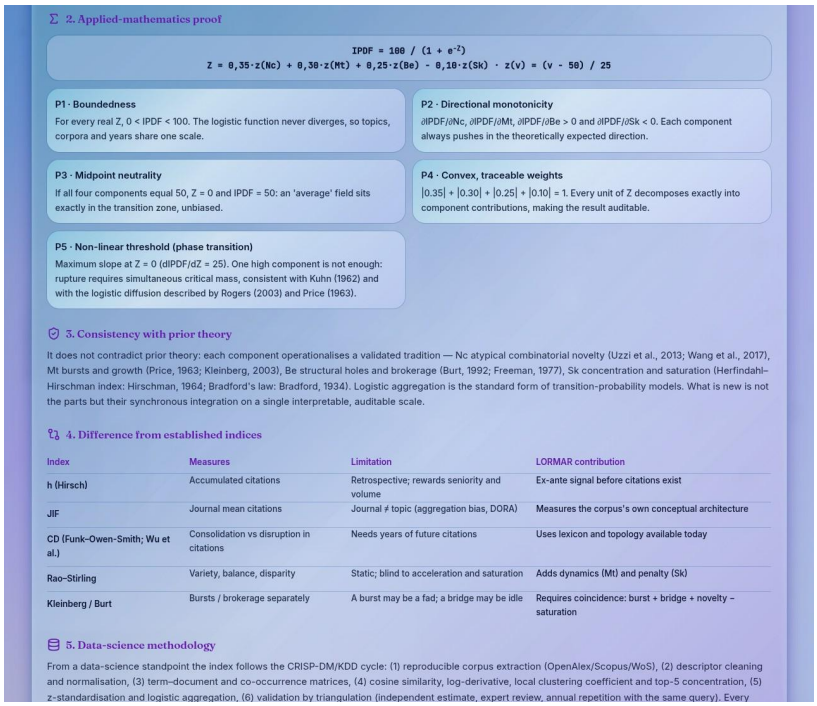
≥ 70: high rupture potential; 55–69: emerging frontier; 45–54: transition; < 45: incremental or consolidated field. The site translates each component into plain language.

What it does not yet demonstrate

Its weights are theoretical (a priori). Its predictive ability is a falsifiable hypothesis: the calibration script in «Export & engines» lets you test it on out-of-sample historical cohorts.

Figure 49

IPDF mathematical demonstration: formula, properties P1–P5, theoretical coherence and difference from established indices.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

30. The Comprehensive bibliometric report (PDF)

It is a long document, APA 7 compliant, with white backgrounds and vector figures. It is organised to be read in layers: quick synthesis first, depth afterwards.

Structure

Cover with logo and Query ID → linked contents → opening and methodological flow → sections with numbered figures → closing of each section (conclusions, scope, researchable topics) → executive synthesis and role-based recommendations → references.

Three kinds of statement

Finding: comes from corpus data. Protocol: a proposed procedure not yet run (e.g. PLS-SEM). Hypothesis: a conjecture to be tested. The report always states which is which.

Notes for researchers

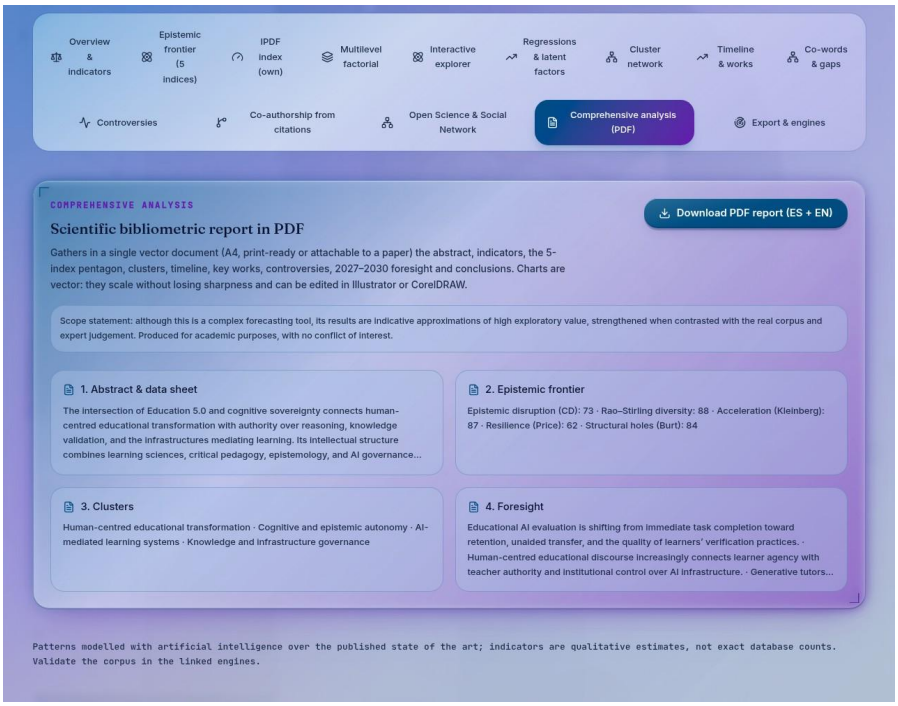
Boxes with plain reading and reading signs (icons) accompany technical conclusions. Holographic seals and decorations never encode data.

How to cite it

Use the final APA 7 reference, which includes the IC: with it any reviewer can repeat the same query.

Figure 50

«Comprehensive analysis»: «Download PDF report (ES + EN)» button, scope statement and preview of its sections.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

31. Reports in research methodology

A bibliometric report is not the end of research: it is the map for starting it well. This table shows at which stage each result contributes and what decision it helps make.

Stage	Laboratory result	Decision it supports
Problem	Burt's holes, co-words, bridges	Is there a real gap that justifies the study?
Question and objectives	Researchable topics in each section closing	Formulate bounded, verifiable questions
State of the art	Clusters, timeline, key works, co-authorship	What to read first and how to organise the theory chapter
Theoretical framework	Callon quadrants, hemisphere spectrum, MCA plane	Which traditions interact and which are isolated
Hypotheses	Conditional anticipations, refutation signals, IPDF	State falsifiable conjectures; H0/H1 only with experimental design
Design and method	PLS-SEM protocol, KMO, multibase	Choose instruments and sample size; the protocol does not replace measurement
Discussion	Controversies, epistemic frontier	Place your own results against the debates
Transfer and management	Executive synthesis, role recommendations, open science	Prioritise lines, partnerships and funding with expert judgement

From map to reading

Use key works and bridges as a priority reading list. No metric replaces reading the original texts.

Report transparently

In your thesis or article, state source (OpenAlex), date, equation, sample size, mode (strict, normalised or flexible) and Query ID. Any reviewer can then repeat it.

32. Scientific rigour, AI and the M.I.C.H. approach

Artificial intelligence is an instrumental aid: it organises, suggests and drafts. Critical judgement and the final decision are always human.

Cognitive sovereignty

Use AI to think better, not to stop thinking. Check every suggestion against the original works.

Responsible assessment

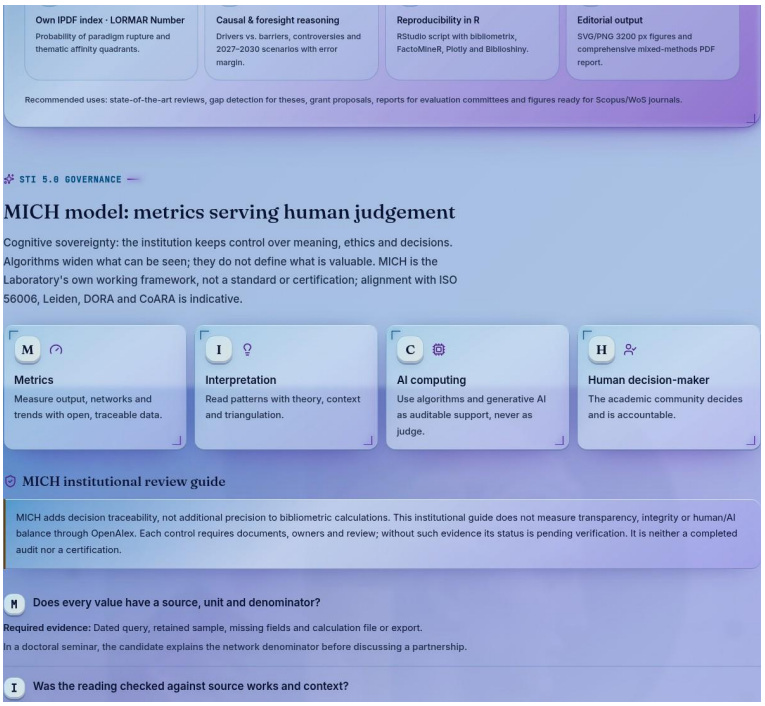
Metrics guide but do not replace expert reading (DORA, Leiden Manifesto, CoARA). Citations measure visibility, not quality.

M.I.C.H. assistant

Interpretation tutor, justification writer and 5.0 competency diagnosis. It works only with the analysis data and never invents figures, authors or causes.

Figure 51

M.I.C.H. model: Metric, Interpretation, Computing with AI and Human decision-maker, with the institutional review guideline.



Note. Screenshot of rafael-lorenzo.institute (2026). Illustrative image; Laboratory results come from a sample analysis and change with the topic.

33. Recommended paths by role

You do not need to read everything. Choose the path that fits your role.

Thesis student

Overview → Network and Callon → Co-words and gaps → Hemisphere spectrum → PDF report (closings and researchable topics) → cite key works.

Mentor or committee

Report's verdict flow → LORMAR in plain language → limits and refutation signals → compare with the student's proposal.

Manager or university

Executive synthesis → role-based recommendations → co-authorship and open science (partnerships by country and institution) → M.I.C.H. governance.

34. Common problems and how to solve them

Messages you may see and what to do in each case.

«OpenAlex reached its limit»

The system retries automatically and, if needed, uses the site's own connection. If it persists, wait a few minutes.

«OpenAlex returned no works»

Try broader or English terms, or fewer concepts. If you were analysing an imported file, import it again.

«Key required»

AI functions need the administrator key so that credits are not spent without authorisation.

Rejected records in a RIS

The audit shows row and reason (missing title, invalid year). Check those records in the original file.

Part V · Design and software engineering

35. Design catalogue: colours, shapes and voice

The visual identity follows one idea: knowledge in perpetual metamorphosis. Backgrounds shift gently from blue to violet like an atmosphere; gold and cyan accents mark what matters; translucent glass shows depth without hiding data. All decoration is decoration: it never encodes evidence.

Institutional blue #004E83	Research, main buttons, «Topic only» mode
Deep violet #6519AE	Community, gradients, active tab
Luminous violet #895BE5	Halos, reliefs and MICRO layer
Holographic cyan #00B1CB	Sheens, MESO layer, high contrast
Signal gold #DAAD46	Academic items, bridges, tips and conclusions
Archive green #007F4E	«File only» mode and green access
Hybrid magenta #922BA8	«Hybrid» mode
Gap red #DC2626	Horizon > corpus on the radar; alerts

Typefaces

Fraunces (characterful serif) for titles; Inter for reading; JetBrains Mono for tags, technical notes and code. In «Readable typeface» mode everything switches to a plain font.

Shapes

Glass panels with square corner marks (framing marks), rounded chips for filters, circles for nodes, pentagons for the radar, fractals and Fibonacci spirals on covers. Square corner marks mean «analysis module».

Motion

Slow holographic sheens, breathing fractals and soft transitions. Everything stops with «Reduce motion» or if your system requests reduced motion.

Text voice

Close and direct («Choose how to start the engine»), broken into short blocks, yet with epistemic depth: every claim carries its scope. Jargon is avoided when it adds nothing and explained when needed.

Reports in white

PDFs use white backgrounds, readable type and colours from the same family, for printing and APA 7 compliance. The cover keeps the Laboratory emblem unaltered.

36. Overall architecture

Analogy: the site is a building. The shopfront (what you see) runs in your browser; the back office (server) keeps the keys and talks to external services; the warehouse (database) stores content and messages.

Technologies

TanStack Start v1 (React 19, server rendering and server functions), Vite 7, strict TypeScript, Tailwind CSS v4 with semantic tokens, edge runtime (Cloudflare Workers).

Layers

1) Presentation: React routes and components. 2) Pure logic: calculation modules with no browser dependencies, shared by web and PDF. 3) Server services: functions using secrets. 4) Data: Lovable Cloud and open APIs (OpenAlex, ORCID, YouTube).

Guiding principle

Single source of truth: the same calculation feeds the screen, the PDF and automated tests, so they never disagree.

The system's four layers

1	**Presentation**	Pages and dashboard (React)
2	**Pure logic**	Shared calculations web · PDF · tests
3	**Server services**	AI, keyed OpenAlex, ORCID, YouTube
4	**Data**	Lovable Cloud (RLS) and open APIs

37. Folder structure and components

Code is organised by responsibility. File names indicate where they run.

src/routes

One page per file: index (home), curriculum, manifiesto, agenda, testimonios, contactos, infografias, tutorial, auth and the protected panel (_authenticated/panel). api/public hosts the RSS feed and media proxy.

src/components

Visual pieces: laboratorio-cienciometrico (dashboard), informe-integral (PDF generator), explorador-interactivo, analisis-multinivel, mapa-copalabras, red-coautoria, ciencia-abierta-red, protocolos-avanzados (multibase import), descargas-laboratorio, asistente-mich, boton-cita, grafico-plotly (lazy loading) and the ui/ library (buttons, dialogs, tabs).

src/lib

Logic: pure modules (corpus-cientifico, red-cientifica, multinivel, dendrograma, booleana, radar-comparado, ipdf, lormar-fundamento, calibracion-lormar, ingesta-multibase, citas…), PDF vector renderers (*-pdf.ts), bilingual texts and server functions (*.functions.ts, *.server.ts). Every critical module has a .test.ts file.

src/data

Fixed editorial data: profile, events and certificates, videos, infographics, essays and repositories.

38. Services and server functions

Server functions run outside the browser: secret keys live there and never reach the visitor.

Artificial intelligence

cienciometria (structural field analysis), asistente-mich, vacios-ia, recomendador and resumen use Gemini models through Lovable AI Gateway. All validate the administrator key server-side before spending credits.

OpenAlex

The browser queries the open API with retries honouring «Retry-After». If the free quota runs out, the openalex function uses the site key, restricted to /works reads so it cannot be reused for anything else.

Content and community

contenido, foro, boletin, metricas, admin, clave-admin and idioma-preferencia. ORCID and YouTube sync from the server (orcid-sync, youtube).

39. Database and analysis flow

Lovable Cloud stores only what the site needs to keep; bibliometric corpora are processed in your browser and are not stored.

Tables

contenidos, canal_publicaciones and redes_sociales (intentionally public read); foro_mensajes; mensajes_contacto and suscriptores_boletin (private); perfil_ajustes; user_roles (protected roles; admin requires a confirmed email). All with row-level security (RLS).

Analysis flow

Topic or file → OpenAlex query (strict, normalised or flexible) → single typed in-memory corpus (with session cache) → pure calculations (networks, factors, indices) → optional AI structure → screen, PDF and exports all use the same corpus.

PDF generation

Built in the browser with jsPDF and shared vector renderers. Each block is measured before drawing to avoid clipped text; APA titles go above and notes below.

40. Security, privacy and quality

Security is applied in several independent layers, so a single failure does not expose data.

Privacy

The personal email does not appear in any public data; public profiles use only safe columns and messages arrive through a form.

Secrets and credits

Keys (AI, OpenAlex) are read only on the server. Every function that spends AI credits requires the administrator key.

Quality and verification

Over 150 automated tests (vitest), type checking, quick and deep security scans, and dependency review. Heavy charts (Plotly) load only when opened so the site stays fast on mobile.

Accessibility

High contrast, high-contrast mode, respect for «reduced motion», alt texts and keyboard navigation.

Quick glossary

Bibliographic coupling	Two works citing the same references.
Cluster	Group of terms that tend to appear together.
Co-occurrence	Two terms present in the same document.
Corpus	Set of analysed works.
DOI	Permanent identifier of a publication.
ERL	The Laboratory's epistemic maturity scale (1–9); exploratory.
Horizon	Heuristic radar reference; not an optimum or a norm.
IC (Query ID)	Query identifier that allows an analysis to be repeated.
IPDF · LORMAR	In-house index of disruptive and frontier potential (0–100).
KMO	Sampling adequacy measure for factor analysis (0 to 1).
M.I.C.H.	Metric, Interpretation, Computing with AI and Human decision-maker: in-house framework, not a certification.
MCA	Multiple correspondence analysis: places terms on a plane by how often they appear together.
OpenAlex	Open bibliographic database (CC0) with over 250 million works.
RLS	Database rules deciding who can see or change each row.
R^2	How well a curve fits the data (0 to 1).
Structural hole	Missing connection between communities that could interact (Burt).
SVG / 600 dpi PNG	Editable vector format / high-resolution print image.