Biointerface Research in Applied Chemistry
Open-Access Journal (ISSN: 2069-5837)

Editorial
Volume 16, Issue 6, 2026, 133
https://doi.org/10.33263/BRIAC166.133

Romanian Science, Infrastructure and Human Capital Nearly Twenty Years after EU Accession

Alexandru Mihai Grumezescu [1,2*]

[1] Department of Science and Engineering of Oxide Materials and Nanomaterials, Faculty of Chemical Engineering and Biotechnologies, National University of Science and Technology POLITEHNICA Bucharest, 1-7 Gheorghe Polizu Street, 011061 Bucharest, Romania; agrumezescu@upb.ro (A.M.G.);
[2] Research Institute of the University of Bucharest, University of Bucharest, 90 Panduri Street, 050663 Bucharest, Romania
* Correspondence: agrumezescu@upb.ro (A.M.G.);

Received: 5.10.2026; Accepted: 15.10.2026; Published: 20.10.2026

Standfirst

The apparent gap between Romania's rising scientific output and its still-limited institutional competitiveness cannot be understood without one central post-accession asymmetry: physical research infrastructure expanded much faster than stable human and operational capacity. Publication growth may reflect metric incentives, but it also reflects scientific capabilities that did not previously exist. In a striking inversion, researchers are now reproached not for failing to work, but for producing too much of what the system spent two decades requiring, counting, and rewarding. Before blaming them, we should remember what they were given to work with - and what remained missing around the machines.

A debate worth having - but not without memory

During the summer and early autumn of 2026, several Romanian public interventions converged on the relationship between scientific publication, research assessment, public funding, and genuine institutional capacity.

Cătălin Lazăr's first essay introduced the hypothesis of a possible "ghost effect": bibliometric and administrative signals may improve before the academic structures expected to sustain them become equally visible. Importantly, the analysis reported citation indicators above the world average and found no statistically significant relationship between institutional exposure to a high-volume publisher and lower field-weighted citation impact or fewer citations per publication. Therefore, this analysis did not support the convenient conclusion that Romania simply publishes much and poorly. The only visible association was with the expansion of output [1].

Daniel Nica placed the problem in a longer history of *publish-or-perish*. His account described the equivalent of a cobra effect: indicators introduced partly to reduce arbitrariness become professional targets, and the people subjected to them learn to generate the signals being rewarded. A mechanism intended to make evaluation more objective may therefore produce new forms of strategic behavior [2].

Lazăr's second essay moved the argument from publication counts towards the conversion of resources into knowledge. It proposed examining the chain from input to process, output, outcome, and impact, warning that contracted funds, completed procurement, and administrative milestones are not equivalent to persistent scientific capacity [3].

A more polemical intervention described Romanian evaluation as a system that counts publications rather than reading them and invoked the imagery of an article factory producing "cardboard science." It correctly identified a structural weakness: administratively similar scores may be assigned to scientifically incomparable contributions. Its rhetoric also illustrated, however, how easily criticism of an institutional system can slide into moral suspicion of the researcher [4].

Finally, the Bureau of the Presidium of the Romanian Academy gave institutional form to several of these concerns. Its September 2026 statement warned against author-fee business models when they are combined with excessive special issues, implausibly rapid processing, weak selectivity, problematic citation practices, or aggressive solicitation. It called for less mechanical and more qualitative research assessment while explicitly acknowledging that Open Access does not necessarily require an author fee [5].

These interventions do not make identical claims, and they should not be collapsed into a single position. Together, however, they mark a shift in the Romanian debate. The vocabulary moves from institutional diagnosis towards increasingly moral categories: imposture, shortcuts, article factories, simulated peer review, and researchers - especially younger researchers - who must be warned against the temptations of rapid publication.

The underlying concerns are real. Indicators can be gamed. Some articles are weak or redundant. Some editorial processes are insufficiently rigorous. Public money can be spent badly. None of this should be denied.

Yet a systemic diagnosis is incomplete when it places the most visible moral responsibility on the person at the end of the chain: the researcher whose name appears on the paper.

This editorial adds a question that has received comparatively less attention: *Before judging what Romanian researchers produce today, have we honestly remembered what Romanian research looked like before 2007, and what kind of scientific system was actually built around the equipment purchased after accession?*

Remembering the pre-accession laboratory

Romania had excellent researchers before it joined the European Union. It had respected scientific schools, internationally connected groups, and institutes capable of producing work at a high level. Any description of pre-accession Romanian science as an intellectual desert would be historically inaccurate and profoundly unfair to the generations who worked under much more difficult material conditions.

What Romania frequently lacked was not intelligence. It lacked the environment in which intelligence could operate at an internationally competitive scale.

Modern equipment was distributed unevenly. Instruments could be old, locally repaired, and used far beyond their expected technological lifetime. Access to specialized software, computing resources, consumables, and current scientific literature was inconsistent. Certain measurements had to be performed abroad not merely because international collaboration was desirable, but because the relevant capability did not exist locally.

The European Commission's 2022 review of the Romanian research and innovation system describes Romanian research organizations as having been historically underfunded in equipment and infrastructure. It concludes that accession to the European Union and the availability of Structural Funds changed this situation profoundly [6].

That transformation must be acknowledged before it is criticized.

If researchers gain access to instruments their predecessors did not possess, to international literature that was once difficult or expensive to obtain, to greater computational power, and to European scientific networks, one should expect them to produce more experiments, more data, and eventually more publications.

An increase in publication output following a substantial expansion of research capability is not, by itself, evidence of bibliometric gaming.

It may also be what additional scientific capacity looks like when it begins to work.

Romania is not unique in this respect. Its experience illustrates a broader problem in research systems undergoing rapid convergence: capital expenditure can be increased far more quickly than stable careers, institutional memory, and the human ecosystems required to transform capital into science.

A machine can be delivered in months.

Expertise may take years to build and can disappear with a single resignation.

Romania's double transformation

The years surrounding EU accession produced two transformations that are often discussed separately but should be understood together.

The first was material. Romania acquired modern instruments, renovated laboratories, expanded computing resources, entered European research networks, and developed much broader access to international scientific literature.

The second was administrative. Internationally visible publication became progressively more consequential for academic careers.

This process began before accession. The national evaluation framework adopted in 2005 for promotion to professor was, on paper, remarkably sophisticated. It did not merely count publications. It evaluated teaching, research activity, significant scientific contributions, and professional prestige. It treated international visibility as fundamental, required the major criteria to be fulfilled cumulatively, and included indexed publications, competitive grants, citations, books, teaching activity, and broader scientific recognition [7].

The framework was subsequently supplemented through field-specific equivalences and through the recognition of research and innovation contracts and coordination roles in international projects [8–10].

This point matters because the Romanian system did not suddenly discover international publication in 2011. Nor was the pre-2011 system simply one in which nobody had to satisfy scientific standards.

The historical difference was more subtle. National criteria existed, but they operated alongside statutory seniority requirements, broader portfolio assessment, institutional control over positions, and a larger margin for local interpretation.

Later reforms attempted to reduce that margin by making eligibility increasingly explicit and externally verifiable. Researchers therefore received two simultaneous messages: i) they were given more means with which to produce research and ii) they were also told more clearly that internationally visible publication mattered for professional advancement.

The resulting increase in indexed publications cannot be attributed honestly to either process alone.

It was not only the consequence of new equipment.

It was not only the consequence of bibliometric pressure.

It emerged from the interaction between expanded productive capacity and expanded professional incentives.

In the working Web of Science extraction prepared for this editorial, Romanian "output" increased from 4,263 documents in 2005 to 15,259 in 2010. These historical counts are not a pure measure of newly produced research: database coverage, document types, retrospective indexing, and the inclusion of Romanian journals also changed. The chronology nevertheless matters. Romania's first major bibliometric expansion preceded the contemporary controversy surrounding high-volume Open Access publishing [11].

Romanian science was becoming materially more capable and administratively more measurable at the same time.

The regulatory clusterfuck

The evolution of Romanian academic assessment between 2005 and 2026 was not a clean transition from subjective judgment to objective metrics.

The 2005 framework already contained both quantitative thresholds and qualitative dimensions. It was subsequently supplemented by field-specific equivalences and broader recognition of different forms of research activity [7–10].

The 2011 reform moved more decisively towards mandatory, discipline-specific national standards. New orders covered exact and natural sciences, engineering, biomedical fields, social sciences, arts, and humanities. They introduced formal verification sheets and, in several domains, calculations involving journal impact, influence scores, authorship position, citations, and other measurable indicators. Eligibility could increasingly be checked through a spreadsheet before substantive judgment even began [12–15].

The 2011 architecture also initially linked professorship more closely to habilitation and doctoral supervision. It represented an attempt to reduce the role of seniority and local discretion by establishing national thresholds that every candidate had to meet [12].

What followed was considerably less coherent.

In December 2012, an emergency ordinance decoupled habilitation from the professorship: habilitation remained relevant to doctoral supervision, but it was no longer a mandatory condition for becoming a professor [16].

A ministerial order adopted almost immediately afterward replaced the 2011 promotion standards with 35 new disciplinary frameworks. The older habilitation standards were temporarily preserved, creating a hybrid arrangement in which professorship and habilitation were evaluated under partially different architectures [17].

Only months later, 16 of the 35 disciplinary annexes were replaced again. Another order adopted at the end of 2013 realigned eligibility for habilitation with the minimum standards for professorship, although habilitation itself remained unnecessary for obtaining the professorial title [18,19].

By 2016, the Ministry publicly described the effects of the successive 2012-2013 changes as having made the standards "excessively permissive," producing imbalances between disciplines and confusion about academic value. A new framework was then adopted to tighten and recalibrate the standards once more [20,21].

In deliberately undiplomatic language, this amounted to a regulatory clusterfuck. By a regulatory clusterfuck, I mean a self-defeating accumulation of overlapping rules, replaced annexes, partial reversals, and corrective reforms that made academic advancement formally

precise but institutionally unpredictable. The problem was not the absence of rules, but an excess of unstable rules whose interpretation remained unevenly controlled.

Under such conditions, accumulating publications, citations, grants, and other portable indicators was not necessarily evidence of intellectual opportunism. It was also a rational form of professional insurance against the next regulatory change. Researchers were not merely learning how to satisfy demanding standards; they were learning how to remain eligible when the standards themselves could be rewritten.

Nor did the regulatory pendulum stop in 2016.

In 2025, Romania adopted another set of 35 national standards for associate professorship, professorship, and habilitation, applicable from the 2026–2027 academic year and replacing the 2016 regime. A separate order introduced 35 sets of national minimum standards for doctoral degrees, applicable to doctoral students enrolled from 2025–2026. Across multiple disciplines, the new cycle raised thresholds, introduced additional filters, or changed the types of outputs considered eligible [22,23].

The newest architecture is again hybrid.

It preserves - and in several areas strengthens - the quantitative gate. At the same time, portions of the framework explicitly return substantive ranking to qualitative judgment by competition committees.

Researchers have therefore repeatedly been taught to optimize a moving target.

The system first changed how much they had to produce.

Then it changed what counted.

Finally, it reminded them that satisfying the numbers would still not necessarily be sufficient.

This history raises an empirical question that has never been answered systematically.

If standards were relaxed partly because academic promotion had become too difficult, whose promotion became possible?

Did repeated rewriting merely correct unrealistic barriers in certain fields?

Or did it also create windows in which entrenched institutional networks could convert control over vacancies, candidate pools, committees, and local decisions into accelerated advancement?

Promotion during those periods is not evidence of wrongdoing. Many excellent candidates were undoubtedly promoted legitimately. Nor can the answer be reconstructed through anecdote or political memory.

The importance of the question lies elsewhere: the sophistication of the standard does not tell us who benefited from the way it was implemented.

Good criteria do not open positions.

They do not create genuine competition.

They do not select committees.

They do not eliminate conflicts of interest.

They do not determine which contributions are treated as decisive and which are ignored.

Institutions and people do those things.

The deeper consequence was not confusion alone. The rules became increasingly precise, while power over their interpretation remained unevenly distributed. Candidates had to document compliance with a moving set of requirements; those designing, interpreting, and

validating those requirements retained considerably more room to decide what compliance ultimately meant. This is where regulatory disorder became institutional power.

Standards for others?

The regulatory instability contained another, more uncomfortable asymmetry.

Would every person empowered to formulate, interpret, or enforce national standards have passed the same evaluative gate?

This is not an accusation against every commission member, evaluator, or institutional decision-maker. Nor can a scholar's entire career be judged retrospectively through requirements adopted much later.

The structural question nevertheless remains legitimate.

The candidate is expected to demonstrate eligibility through documents, calculations, publication lists, citation records, verification sheets, and formal thresholds.

The authority of the evaluator may derive primarily from nomination, institutional position, seniority, or reputation.

The resulting asymmetry can be stated simply: *The candidate must demonstrate compliance; the gatekeeper is presumed competent by appointment.*

Under such conditions, criteria risk becoming strict downwards and flexible upwards.

Those seeking promotion must prove in detail that they satisfy the applicable standard. Those who write, interpret, or validate the standard may occupy a more protected institutional position, without an equivalent public demonstration that they themselves satisfy the gate they administer.

The issue is not merely personal inconsistency, although the irony is difficult to overlook.

It is the possibility that evaluation becomes a formal ceremony rather than a symmetrically applied test of academic value.

The form exists.

The verification sheet exists.

The threshold exists.

The institutional decision can therefore appear impersonal and meritocratic.

Yet formal precision does not guarantee substantive symmetry.

A standard may be enforced rigorously against the candidate while the competence of those applying it is largely assumed.

Criteria can consequently perform two different functions.

They may genuinely constrain arbitrary promotion by imposing nationally verifiable requirements.

But they may also provide an administrative language through which decisions shaped elsewhere - through control of vacancies, committees, candidate pools, and institutional networks - acquire the appearance of objective validation.

The system appears impersonal because it uses formulas.

Formulas do not eliminate power.

They change the language through which power is exercised.

A teaching title without teaching criteria?

The standards adopted in 2016/2025 reveal another structural inconsistency.

The 35 disciplinary frameworks are highly heterogeneous. In some commissions, books, university courses, manuals, teaching materials, program coordination, supervision, and educational contributions are explicitly recognized. In others, the minimum national requirements for associate professorship and professorship are dominated by scientific publications, citations, journal rankings, impact indicators, grants, patents, and research portfolios [23].

In those fields, the national standard says considerably more about the candidate's performance as a researcher than about their capacity to perform the function named in the title: university professor.

This is difficult to reconcile with the legal content of an academic position.

Romanian higher-education law defines the university workload as comprising teaching and/or research. Teaching activity can include lectures, seminars, practical and laboratory work, assessment, supervision of undergraduate, master's, and doctoral work, tutoring, consultations, committee work, preparation of teaching materials, and development of digital educational content. The total workload corresponds to 40 hours per week, while professors and associate professors also carry minimum weekly teaching obligations [24].

Yet the national gateway to a teaching title can, in some disciplines, be crossed with limited explicit evidence concerning teaching itself.

It may be argued that these are only minimum national thresholds and that universities may impose additional institutional requirements. Formally, this is correct.

But minimum standards are not neutral.

They define the nationally portable evidence of academic legitimacy.

Candidates know that publications, citations, and impact indicators travel between institutions and remain legally indispensable. Teaching performance may remain locally defined, less visible, and more difficult to verify.

What the national standard omits can shape behavior as powerfully as what it includes.

Nica's discussion of teaching belongs directly in this argument: academic work can be necessary, demanding, and valuable while remaining weakly reflected in the indicators used to reward it [2]. The institutional question is how teaching obligations, protected research time, and career assessment are coordinated, so that researchers are evaluated with an explicit account of the work their positions require.

The inconsistency becomes sharper when university teaching positions and senior research grades are treated as professionally equivalent.

Romanian law equates researcher grade II with associate professor and researcher grade I with professor. Academic equivalence may be legitimate. The working conditions of the two careers, however, are not identical [25].

A full-time researcher is employed primarily to conduct research, development, innovation, dissemination, project work, and knowledge transfer. Researchers may also teach, supervise students, and perform substantial administration, but research remains the organizing mission of the position.

A member of the teaching staff divides professional time among lectures, seminars, assessment, supervision, course preparation, program administration, committee work, and research.

The two careers therefore do not necessarily provide the same amount of protected research time.

Nevertheless, their visible scientific achievements are frequently read through a common vocabulary of publications, citations, impact, and grants, as if the opportunity structures producing those achievements were equivalent.

They are not.

A publication count does not record how many courses were taught.

An h-index does not disclose how many examinations were graded, theses supervised, curricula updated, or hours spent preparing students.

A citation threshold does not distinguish between a career organized primarily around research and one in which research must be produced alongside substantial teaching and institutional obligations.

The anomaly can be stated simply: *Equal research expectations, unequal protected research time.*

This is not necessarily equality between academic careers.

It is an equivalence that measures research output while disregarding research opportunity.

And it reproduces a pattern visible throughout the system: activities that can be standardized nationally become highly visible, while work that is institutionally specific, locally consumed, or difficult to quantify gradually disappears from the evaluative picture.

The machines arrived

The scale of post-accession infrastructure investment should not be minimized.

The European review reported that, during the 2014–2020 programming period, more than 45% of research-and-innovation Cohesion Policy funding under the Competitiveness Program was allocated to research-infrastructure investment, while only around 5% was allocated to public-sector research activities.

The national platform claimed to contain 2,138 research infrastructures and 29,339 pieces of research equipment, although the same report warned that definitions were inconsistent and that equipment was fragmented across many relatively small facilities [6].

These numbers should not be used merely to mock an overpopulated inventory.

They represent a genuine historical shift.

Romania became able to purchase scientific tools that would have been difficult or impossible to finance from national resources alone in the early 2000s.

That was an achievement.

But acquiring an instrument and creating scientific capacity are not the same thing.

A mass spectrometer is not a research program.

A microscope is not a laboratory.

A sequencing platform is not a scientific team.

A computing cluster is not computational science.

They are tools - potentially transformative tools - but their scientific value depends on the system surrounding them.

A research system can modernize its equipment much faster than it modernizes the human institutions that give the equipment meaning.

A machine is not a laboratory

Every sophisticated instrument has an invisible second half.

A person.

Usually, several people.

Someone must know how to operate it, calibrate it, and recognize when an apparently convincing result is actually an artifact. Someone must know what to do when a detector drifts, contamination appears, a pump fails, a laser loses alignment, or a software update disrupts the workflow. Someone must understand the sample before it reaches the machine and the data after they leave it.

That knowledge is not contained in the procurement file.

It is not delivered automatically with the instrument.

It accumulates in people.

The same European review that documented the expansion of research infrastructure described Romania's lack of a critical mass of researchers as a major structural problem. It characterized the number of researchers as critically low and identified weak career attractiveness, fragmented governance, financial unpredictability, and the erosion of human capital as mutually reinforcing weaknesses [6].

The contrast is striking.

Romania's total R&D personnel amounted to 28,977 full-time equivalents in 2007 and 33,189 in 2020. Physical research capital had changed dramatically; the human system had expanded far more modestly [6].

Human capacity is not simply a headcount.

It is a combination of skills, employment stability, career continuity, institutional memory, and the ability to replace expertise without losing the scientific function of the laboratory.

A facility may officially have five people "associated" with an instrument and still lack one permanently employed researcher whose principal responsibility is to operate it.

A doctoral student may become the de facto operator, only to leave when the degree or grant ends.

A researcher may be trained by the supplier and later move abroad, taking years of tacit knowledge with them.

The machine remains.

Part of the infrastructure leaves.

Scientific infrastructure is embodied knowledge.

We funded capital more easily than continuity

This imbalance cannot be explained adequately as the personal failure of individual project managers.

Project logic makes equipment easier to finance and report than human continuity.

An instrument has a price, a procurement procedure, a serial number, a delivery date, and an acceptance report. A project indicator can record that it was purchased, installed, and commissioned.

The result fits neatly into a spreadsheet.

Expertise does not.

A researcher must be trained and retained.

Another researcher needs a credible career path.

A data specialist employed on one grant must have a reason to remain when the next competition is delayed.

A laboratory manager may require years to become fully competent and can disappear from the institution with one decision to pursue a more stable career elsewhere.

A procurement has an end date.

Expertise does not.

It is tempting to say that project managers bought expensive equipment and forgot the people. In some cases, planning may indeed have been inadequate.

The deeper problem is structural: funding architecture, institutional planning, and project logic collectively made it easier to purchase equipment than to guarantee long-term research careers around it.

A project can finance a machine over three years.

A scientific ecosystem may require a generation.

Romania learned to finance the purchase price of research capacity more readily than its human and operational life.

The official diagnosis is already there

This is not merely an impression shared by people working in laboratories.

The European review found that funding for operating research equipment and infrastructure was insufficient. It described a persistent shortage of resources for operating relatively modern equipment and concluded that utilization was not adequately monitored. It called for more consistent tools and procedures for monitoring equipment sharing and use [6].

It also made a distinction that should be obvious but is frequently forgotten: listing equipment in a national platform without real users does not fulfill the purpose of infrastructure sharing [6].

The same review described equipment used by individual research groups without a clear, publicly available access policy [6]. Access therefore deserves scrutiny in its own right. A functioning instrument costing millions of euros may still be effectively unavailable to qualified researchers. If one person can decide, without published criteria or institutional review, whose samples are accepted, when measurements are performed, and who is trained to use the instrument, public access becomes dependent on personal permission. Equipment can remain effectively under lock and key for some researchers while serving a preferred circle. Such discretion shapes who can generate data, complete projects, publish, and compete for promotion.

Neither securing the original grant nor having led the laboratory should confer a permanent personal veto over publicly funded equipment. Retirement, departure, or a change of leadership should trigger a documented handover of responsibilities and knowledge. Any continuing authority should rest on an explicit, reviewable institutional role. Safety, training, maintenance, and legitimate scientific priorities should be addressed through published access rules, transparent scheduling, and documented reasons for refusal. Publicly funded equipment must not become a lifetime instrument of personal authority.

An instrument appearing in an inventory is not necessarily scientific capacity.

An instrument installed in a laboratory is not necessarily scientific capacity.

Even an operational instrument is not automatically scientific capacity.

Scientific capacity emerges only when equipment, trained people, maintenance, consumables, time, access, funding, and scientific questions coexist long enough to produce knowledge.

The relationship is not simply additive. It is closer to multiplicative:

Equipment × Skilled People × Operating Resources × Effective Access × Institutional Continuity = Effective Scientific Capacity

If one factor approaches zero, the practical value of the entire system can collapse.

A technically advanced instrument without a researcher capable of operating it is not merely less productive.

It may become effectively unusable.

A brilliant team without consumables cannot compensate indefinitely through motivation.

A productive laboratory without continuity can disappear when the grant ends.

The missing conversion layer

This distinction changes how we should interpret the alleged gap between bibliometric performance and institutional competitiveness.

A publication is an individual or team-level result.

Institutional competitiveness is an organizational outcome.

The two are connected, but they are not identical.

A paper does not turn itself into a stable research group, a successful follow-on grant, a strong doctoral school, a sustainable research career structure, an international recruitment strategy, or lasting institutional reputation.

That conversion requires organizational capacity.

It requires institutions to retain people, preserve knowledge, maintain equipment, connect projects over time, and transform temporary funding into persistent capability.

The "ghost effect" proposed in the recent Romanian debate is a useful hypothesis: bibliometric signals may improve before the structures that should sustain them become equally visible.

But if output rises while organizational competitiveness does not rise proportionally, the conversion mechanism should be examined before the output itself is declared hollow [1].

The researcher can produce an article.

The institution must transform the cumulative work of its researchers into durable capacity.

If that transformation fails, responsibility cannot be assigned automatically to the person whose name is visible on the paper.

What publication growth can - and cannot - tell us

The publication record still matters.

It cannot be treated as meaningless simply because it is countable.

In the working Web of Science extraction used for this editorial, Romania recorded approximately 20,448 documents in 2015, of which 5,167 were classified as Open Access. In 2025, total output was approximately 22,502 documents, of which 16,202 were Open Access [11].

Over that decade, total output increased by roughly 10%.

Open Access output increased by approximately 214%.

The non-Open-Access component declined by almost 59%.

Romania did not simply become a country that published vastly more.

It became a country that published very differently.

This shift should not be confused with a direct measure of scientific quality.

Open Access is a mode of access and a family of economic arrangements, not a scientific verdict.

Nor does Open Access necessarily mean that an author personally paid a fee.

The Romanian Academy's statement correctly recognizes this distinction. It warns against specific combinations of author-fee business models and questionable editorial practices while acknowledging repositories and Open Access journals that do not charge authors [5].

A paywall, however, is not a certificate of rigor either.

The financial route through which an article becomes accessible may create incentives worth examining, but it cannot substitute for reading the paper, evaluating the method, and understanding the contribution.

The publication series also cannot establish that infrastructure investment caused bibliometric growth. It is consistent with a broad expansion of scientific capability, but historical counts also reflect changing database coverage, journal inclusion, document types, and metadata.

The defensible conclusion is narrower: *Romania's publication growth cannot be interpreted credibly without accounting for the profound change in the material, informational, regulatory, and professional conditions under which research was produced.*

A paper is the visible end of an invisible process

This is why the language of "output" should be used carefully.

A paper may represent three years of experiments.

Five years of patient follow-up.

Thousands of samples.

A field campaign.

A piece of software.

A carefully curated dataset.

Hundreds of unsuccessful experiments that never appear in the final text.

A systematic review can condense the screening and evaluation of thousands of records into a single DOI.

Countability does not make that labor trivial.

There is an odd symmetry in the current debate.

The bureaucratic system reduces the article to a point.

The critic of excessive metricization can then reduce the same article to "output."

In both cases, the work inside the publication disappears.

Reducing scientific work to output is an oddly bureaucratic way to criticize bureaucracy.

The problem is not that publications can be counted.

The problem begins when evaluation ends with the count.

Nor should infrastructure be evaluated through publication counts alone. Training, analytical services, datasets, methods, prototypes, negative findings, and enabling functions are legitimate scientific outcomes.

The point is not to replace one crude metric with another.

It is to stop mistaking the proxy for the thing itself.

Before we blame the researcher

The researcher is the most visible unit in this system.
Their name appears on the paper.
Their publication record can be opened.
Their citations can be counted.
Their apparent productivity can be compared.
What is much less visible is the institutional friction behind that record.
The instrument waiting for repair.
The expired service contract.
The reagent that could not be purchased until a budget line became available.
The researcher whose employment ended with the project.
The measurement that had to be outsourced.
The database that took years to assemble.
The new student trained from the beginning because the previous one left.
The years between funding competitions.
The teaching.
The administration.
And still, the researcher is expected to publish.

Researchers did not independently invent the national standards under which publication became professionally consequential.

They did not design all the funding programs that favored capital acquisition.

They do not individually determine whether an instrument receives an operating budget after the project ends.

They work inside those choices.

Some researchers undoubtedly optimize indicators excessively. Some divide results unnecessarily, choose weak venues, or confuse productivity with contribution. Some infrastructure investments were poorly planned, and some expensive instruments are almost certainly underused.

None of this should be denied.

But these problems must be demonstrated rather than presumed collectively from aggregate publication growth.

A system-wide rise in publishing cannot be explained satisfactorily as a system-wide decline in scientific character.

When thousands of people change behavior in the same direction, the first serious question is what changed in their environment.

Romanian researchers gained capabilities that often did not exist before accession.

They were simultaneously told more clearly that internationally visible publication mattered.

More research became possible.
More publication became professionally necessary.
Both statements can be true at once.

When we stop counting, who decides what counts?

The criticism of mechanical bibliometrics is justified.

Journal-level indicators cannot substitute for reading the work, understanding the method, and evaluating the candidate's actual contribution.

But returning to "qualitative evaluation" is not automatically progress.

Qualitative judgment is not institutionally neutral.

It concentrates authority in the people selected to exercise it.

The relevant questions are therefore not only whether an evaluation is qualitative, but who evaluates, how evaluators are selected, what relationships they have with the candidate, whether genuine external competition exists, how conflicts of interest are managed, and whether decisions can survive independent scrutiny.

These questions begin before assessment itself: discretionary access to publicly funded facilities can shape the publication record that an evaluator later interprets as evidence of individual merit.

Romania introduced externally verifiable standards partly because local academic judgment had not always produced open, competitive, and meritocratic advancement.

Removing excessive reliance on indicators without remembering why indicators became attractive could reconstruct precisely the gatekeeping they were intended to constrain.

The 2005 framework demonstrates that a mixed evaluative model was already possible. It combined international visibility and minimum requirements with teaching, significant contributions, scientific prestige, and broader professional judgment [7].

Its existence did not guarantee that the strongest candidate would necessarily win.

Good criteria do not implement themselves.

A technically elegant framework can still be applied by a closed institution.

"Experts will recognize quality when they see it" is reassuring only when the experts are independent, competition is genuine, conflicts are controlled, and the decision can survive external scrutiny.

Otherwise, qualitative evaluation may become an elegant name for the return of the right local network.

Romania should not correct the monopoly of the indicator by restoring the monopoly of the gatekeeper.

That would not be reform.

It would be an overcorrection back into the past.

Conclusion

Romania's scientific transformation after accession was materially real.

Modern equipment, international access, computing resources, and research connectivity expanded considerably. Publication growth cannot be interpreted honestly as metric inflation alone.

At the same time, equipment acquisition was not matched consistently by the construction of stable human and operational systems. A purchased instrument is not scientific capacity unless people, maintenance, consumables, access, and institutional continuity exist around it.

The evolution of academic criteria was neither stable nor linear. Between 2005 and 2026, Romania moved through sophisticated mixed criteria, discipline-specific thresholds, altered habilitation rules, replaced annexes, permissive recalibrations, renewed tightening, and a later combination of higher quantitative gates with renewed qualitative discretion.

Researchers learned not merely to meet standards, but to survive their repeated rewriting.

The newest standards expose another contradiction. In some disciplines, eligibility for teaching titles is defined predominantly through research indicators, while teaching itself remains weakly represented. At the same time, university teachers and full-time researchers may be compared through similar scientific currencies despite markedly different allocations of professional time.

The system declares status equivalent while leaving inequality of research opportunity largely unexamined.

Open Access must also be separated from author fees, editorial quality, and researcher integrity.

Under Horizon Europe, beneficiaries who publish peer-reviewed results must ensure Open Access to them. European policy is pro-openness, not necessarily pro-fee, pro-volume, or pro-commercial concentration [26].

The Council of the European Union has simultaneously supported immediate Open Access and warned that the costs of both reading and publishing have become unsustainable [27].

The Romanian Academy is right to demand evaluation based on originality, reliability, relevance, and contribution rather than empty arithmetic (although one might still ask who decides what counts as original, reliable, or relevant, and by whose standards; after all, truly groundbreaking research often challenges established ideas, and its relevance may only become apparent years later).

But that warning is incomplete if it is directed mainly at younger researchers without an equally serious examination of the rules, competitions, incentives, workloads, and institutional practices that made particular behaviors professionally rational.

Replacing quantitative excess with unprotected qualitative discretion could return Romania to the conditions from which national and externally verifiable standards were meant to provide an escape.

The choice is not between counting everything and trusting the same local hierarchies that controlled recognition twenty years ago.

It is not between the monopoly of the indicator and the monopoly of the gatekeeper.

Nearly twenty years after accession, Romania owns far more sophisticated scientific equipment and produces far more internationally visible research than it once did.

Yet equipment without researchers capable of operating it, maintenance, consumables, stable careers, and institutional memory is not durable scientific capacity.

Before blaming the researcher, we should look again at the laboratory around them.

Look at the machine.

Then look for the researcher who knows how to use it.

Ask whether that researcher still works there.

Ask who is allowed to use the instrument, who decides, and whether that decision can be challenged.

And before celebrating a return to qualitative judgment, ask who will exercise that judgment, over whom, and under what institutional conditions.

Because science is made neither by inventories nor by formulas alone.

It is made by people operating within institutions.

The most expensive component of scientific infrastructure is not always the instrument.

Sometimes it is the expertise that quietly disappears while the instrument remains.

And the greatest danger in "reforming" (this is the Romanian translation for the word advancement in CoARA) research assessment is not only that we may continue counting the wrong things. The ultimate irony of this regulatory clusterfuck would be to abolish the arithmetic without abolishing the power behind it, to stop counting papers only to let the same old, unaccountable gatekeepers decide once again whose work, whose voice, and whose career count.

References

1. Lazăr, C. Dincolo de metrici și retorici: De ce creșterea performanței bibliometrice nu se transformă automat în competitivitate universitară? [Beyond metrics and rhetoric: Why increased bibliometric performance does not automatically translate into university competitiveness]. *Contributors.ro*, 3 July 2026. Available online: https://www.contributors.ro/dincolo-de-metrici-si-retorici-de-ce-cresterea-performantei-bibliometrice-nu-se-transforma-automat-in-competitivitate-universitara/ (accessed on 1 October 2026).
2. Nica, D. O genealogie a imposturii academice [A genealogy of academic imposture]. *Contributors.ro*, 18 August 2026. Available online: https://www.contributors.ro/o-genealogie-a-imposturii-academice/ (accessed on 1 October 2026).
3. Lazăr, C. Dincolo de metrici și retorici II: Anatomia unui Mexican standoff instituțional și trei cartușe pentru ieșirea din impotența intelectual-administrativă [Beyond metrics and rhetoric II: The anatomy of an institutional Mexican standoff and three rounds for escaping intellectual-administrative impotence]. *Contributors.ro*, 20 August 2026. Available online: https://www.contributors.ro/dincolo-de-metrici-si-retorici-ii-anatomia-unui-mexican-standoff-institutional-si-trei-cartuse-pentru-iesirea-din-impotenta-intelectual-administrativa/ (accessed on 1 October 2026).
4. Iliescu, D. Fabrica de articole: Cum plătim, din bani publici, o știință de carton [The article factory: How public money pays for cardboard science]. *Republica*, 21 August 2026. Available online: https://republica.ro/fabrica-de-articole-cum-platim-din-bani-publici-o-stiinta-de-carton (accessed on 1 October 2026).
5. Academia Română. Pentru o responsabilă și corectă evaluare a cercetării științifice [For a responsible and fair evaluation of scientific research], 21 September 2026. Available online: https://acad.ro/institutia/comunicate/2026/46_EvaluareaCercetarii.html (accessed on 1 October 2026).
6. European Commission, Directorate-General for Research and Innovation. *PSF Country Review of the Romanian Research and Innovation System: Final Report*; Publications Office of the European Union: Luxembourg, 2022. https://doi.org/10.2777/28266.
7. Ministerul Educației și Cercetării. Ordinul nr. 5098 din 3 octombrie 2005 pentru aprobarea Sistemului de evaluare privind conferirea titlului de profesor universitar [Order No. 5098 of 3 October 2005 approving the evaluation system for the title of professor], 2005. Available online: https://legislatie.just.ro/Public/DetaliiDocumentAfis/34936 (accessed on 1 October 2026).
8. Ministerul Educației și Cercetării. Ordinul nr. 3548 din 6 aprilie 2006 privind completarea ordinelor nr. 5098, 5099, 5100 și 5101/2005 pentru aprobarea sistemelor de evaluare privind conferirea titlurilor academice și a gradelor de cercetare [Order No. 3548 supplementing the 2005 academic and research evaluation systems], 2006. Available online: https://legislatie.just.ro/public/DetaliiDocument/70644 (accessed on 1 October 2026).
9. Ministerul Educației, Cercetării și Tineretului. Ordinul nr. 5896 din 11 noiembrie 2008 pentru completarea Sistemului de evaluare privind conferirea titlului de profesor universitar [Order No. 5896 supplementing the evaluation system for professorship], 2008. Available online: https://legislatie.just.ro/Public/FormaPrintabila/00000G10Q88YRTPUZQM0WTUIW4X8CV4S (accessed on 1 October 2026).
10. Ministerul Educației, Cercetării și Tineretului. Ordinul nr. 5897 din 11 noiembrie 2008 pentru completarea Sistemului de evaluare privind conferirea titlului de conferențiar universitar [Order No. 5897 supplementing the evaluation system for associate professorship], 2008. Available online: https://legislatie.just.ro/Public/DetaliiDocument/99610 (accessed on 1 October 2026).
11. Clarivate. Web of Science Core Collection. Available online: https://www.webofscience.com/ (accessed on 1 October 2026).
12. Parlamentul României. Legea educației naționale nr. 1/2011 [National Education Law No. 1/2011], 2011. Available online: https://legislatie.just.ro/Public/DetaliiDocument/267001 (accessed on 1 October 2026).
13. Ministerul Educației, Cercetării, Tineretului și Sportului. Ordinul nr. 4478/2011 privind aprobarea standardelor minimale pentru științele exacte, inginerești și biomedicale [Order No. 4478/2011

approving minimum standards for exact, engineering, and biomedical sciences], 2011. Available online: https://legislatie.just.ro/Public/DetaliiDocumentAfis/129614 (accessed on 1 October 2026).
14. Ministerul Educației, Cercetării, Tineretului și Sportului. Ordinul nr. 4691/2011 privind aprobarea standardelor minimale pentru științele sociale [Order No. 4691/2011 approving minimum standards for the social sciences], 2011. Available online: https://legislatie.just.ro/Public/FormaPrintabila/00000G32DDLE7VXDLQQ2GJ3ZUMBK5AKE (accessed on 1 October 2026).
15. Ministerul Educației, Cercetării, Tineretului și Sportului. Ordinul nr. 4692/2011 privind aprobarea standardelor minimale pentru arte și științe umaniste [Order No. 4692/2011 approving minimum standards for the arts and humanities], 2011. Available online: https://legislatie.just.ro/Public/FormaPrintabila/00000G26SJ74BSR4RNS0HT0B4BF7QV69 (accessed on 1 October 2026).
16. Guvernul României. Ordonanța de urgență nr. 92 din 18 decembrie 2012 privind luarea unor măsuri în domeniul învățământului și cercetării [Emergency Ordinance No. 92 of 18 December 2012], 2012. Available online: https://legislatie.just.ro/Public/DetaliiDocumentAfis/143942 (accessed on 1 October 2026).
17. Ministerul Educației, Cercetării, Tineretului și Sportului. Ordinul nr. 6560 din 20 decembrie 2012 privind aprobarea standardelor minimale necesare și obligatorii [Order No. 6560 approving mandatory minimum standards], 2012. Available online: https://legislatie.just.ro/Public/DetaliiDocumentAfis/144208 (accessed on 1 October 2026).
18. Ministerul Educației Naționale. Ordinul nr. 4204 din 15 iulie 2013 pentru modificarea anexelor la Ordinul nr. 6560/2012 [Order No. 4204 amending the annexes to Order No. 6560/2012], 2013. Available online: https://legislatie.just.ro/Public/DetaliiDocument/149934 (accessed on 1 October 2026).
19. Ministerul Educației Naționale. Ordinul nr. 5648 din 13 decembrie 2013 privind standardele pentru abilitare [Order No. 5648 concerning habilitation standards], 2013. Available online: https://legislatie.just.ro/Public/DetaliiDocumentAfis/153873 (accessed on 1 October 2026).
20. Ministerul Educației Naționale și Cercetării Științifice. Noi standarde minimale necesare și obligatorii pentru accesul la titlurile și funcțiile academice [New mandatory minimum standards for academic titles and positions], 2016. Available online: https://www.edu.ro/noi-standarde-minimale-necesare-%C8%99i-obligatorii-pentru-accesul-la-titlurile-%C8%99i-func%C8%9Biile-academice (accessed on 1 October 2026).
21. Ministerul Educației Naționale și Cercetării Științifice. Ordinul nr. 6129 din 20 decembrie 2016 privind aprobarea standardelor minimale necesare și obligatorii pentru conferirea titlurilor didactice, a gradelor profesionale de cercetare-dezvoltare, a calității de conducător de doctorat și a atestatului de abilitare [Order No. 6129/2016 approving mandatory minimum academic and research standards], 2016. Available online: https://www.edu.ro/ordinul-ministrului-educa%C8%9Biei-na%C8%9Bionale-%C8%99i-cercet%C4%83rii-%C8%99tiin%C8%9Bifice-nr-61292016-privind-aprobarea (accessed on 1 October 2026).
22. Ministerul Educației și Cercetării. Ordinul nr. 3018/2025 privind aprobarea standardelor minimale naționale necesare și obligatorii pentru conferirea diplomei de doctor [Order No. 3018/2025 approving national minimum standards for doctoral degrees], 2025. Available online: https://www.edu.ro/sites/default/files/fisiere%20articole/OMEC_3018-2025.pdf (accessed on 1 October 2026).
23. Ministerul Educației și Cercetării. Ordinul nr. 3019/2025 privind aprobarea standardelor minimale naționale necesare și obligatorii pentru conferirea titlurilor de conferențiar și profesor și a atestatului de abilitare [Order No. 3019/2025 approving national minimum standards for associate professorship, professorship, and habilitation], 2025. Available online: https://www.edu.ro/sites/default/files/fisiere%20articole/OMEC_3019-2025.pdf (accessed on 1 October 2026).
24. Parlamentul României. Legea învățământului superior nr. 199/2023 [Higher Education Law No. 199/2023], 2023. Available online: https://legislatie.just.ro/public/DetaliiDocument/271898 (accessed on 1 October 2026).
25. Parlamentul României. Legea nr. 183/2024 privind statutul personalului de cercetare, dezvoltare și inovare [Law No. 183/2024 on the status of research, development, and innovation personnel], 2024. Available online: https://legislatie.just.ro/Public/DetaliiDocument/283972 (accessed on 1 October 2026).
26. European Research Executive Agency. Open Science. Available online: https://rea.ec.europa.eu/open-science_en (accessed on 1 October 2026).
27. Council of the European Union. Council Calls for Transparent, Equitable, and Open Access to Scholarly Publications, 23 May 2023. Available online: https://www.consilium.europa.eu/en/press/press-releases/2023/05/23/council-calls-for-transparent-equitable-and-open-access-to-scholarly-publications/ (accessed on 1 October 2026).