

ESF MO Forum

“Evaluation: indicators of Internationalisation”

Conference

A dialogue on Evaluation

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The Indicators Forum Report

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1. Internationalisation: a major issue deserving analysis and evaluation

Internationalisation is an increasingly major issue

for European and governmental policies and also for research institutions (funders, performers...)

Several **rationales** for public policies towards internationalisation

- strengthening research excellence and innovation performance
- enlarging the attractiveness of the R&D system
- responding to global problems and positioning the country

Change of meaning

from internationalisation of *researchers and teams* to involvement of *institutions* in international networks, capability to attract researchers, to localise and fund activities abroad...

Rationales for internationalisation (1)

Relevance of evaluation of institution's internationalisation

but still little empirical evidence available, development of indicators still needs dedicated work

→ **a topic which needs further research and development**

For research institutions, different rationales which depend on the different roles in national research system, different resources ...

4 main scientific rationales for FAs and for RPOs

Rationales for internationalisation (2)

Funding Agency	Research Performer
Reaching critical mass	Joining high quality research
Benefit from complementarities	Getting access to additional resources
Aiming at global coverage	Signalling and visibility
Enlarging R&D networks	Broadening the scope of research agenda and networking

2. Indicators: aims and design

Aims

- help institutions positioning, support strategic analysis and decision
- contribute to the coordination of the research system

Expected products of the forum

- analysis of the literature
- design of a common framework for internationalisation objectives and activities of research institutions
- selection of a common set of indicators

Methodology

- start from actors' needs
- involve experts in science policy and indicator design
- allow close interaction between the two groups in all phases of the project

The participative approach to design indicators (1)

Step 1: Overview of MOs policy and instruments. Analysis of the literature. Design of the framework for indicator selection

Step 2: Stepwise selection of a relevant set of indicators

-allowing comprehensive representation of internationalisation processes,

-useful for MOs strategy and management

-relying on available data

Step 3: Test of data availability and description of the indicators

Step 4: Drawing conclusions and recommendations for further work

The participative approach to design indicators (2)

Efficiency of the participative approach

to share common understanding of the issues at stake

to clarify the diversity of points of view among MOs

including mutual understanding between FAs and RPOs

to understand the requirements of indicators definition

to select relevant and feasible indicators that will be used

3. Dimensions of activity impacted by internationalisation (1)

3 usual dimensions affected by internationalisation:

- funding flows
- collaboration and networking
- knowledge production

2 scales:

- internationalisation of research teams and researchers (RPOs), international orientation of funding schemes and their impact on performers (FAs)
- governance and management processes (FAs and RPOs)

→ resulting in **5 dimensions of activity**

Dimensions of activity impacted by internationalisation (2)

Funding Agency		Research Performer	
Resources flow	F1	Resources flow from non national sources	P1 P2
Funding knowledge production	F2 F3	Knowledge production	P3
Funding knowledge circulation	F4 F5	Knowledge circulation	P4 P5
Funding collaboration & networking	F6	Collaboration & networking	P6 P7
Governance and processes	F7 F8	Governance and processes	P8 P9

4. The indicators

For strategic thinking, the matrix crossing rationales and dimensions of activity provides a framework to position actions and results

A set of indicators has to cover the 5 dimensions

→ 8 indicators for FAs, 9 indicators for RPOs

Not all steps of indicator design were completed for each indicator

→ 3 states of development

mature / in development / blue sky

7 mature indicators (1)

Achieved steps

- 1- agreement on the aspect of reality they have to represent (use)
- 2- selecting the measure to be used as proxy (and type of breakdown)
- 3- collection of some data and discussion about limitations and difficulties (incl. the issue of common classifications)
- 4- agreement on a final definition

Steps still to be performed

- 5- more data gathering, establishment of rules about data collection to ensure **comparability** of indicators and **independence** of the data collection process

7 mature indicators (2)

The mature indicators are

F1: Budget for joint research programmes (JRP)

F4 : Budget for attracting researchers from abroad

P1 : Budget coming from abroad

P3: International co-authored papers

P4 : Recruitment of researchers from abroad

F7, P9 : Evaluation procedure: Share of evaluators (or panelists / reviewers) coming from abroad

7 indicators in development (1)

Achieved steps

1-2 Agreement on the relevance of the item, and what we want to represent with the indicator

Steps to be performed

3- More work to select the 'measure' ; test of data collection and further discussion to confirm the feasibility
4 -5 More work to produce the final definition and to establish strict rules for the indicator production

7 indicators in development (2)

The indicators in development phase

- International mobility indicators : F5, P5
- P6 : Budget for joint research programmes and projects (with shared design and management)
- 4 Indicators based of the new field “funding organisations” in WoS databases (see below)

3 blue sky indicators (1)

Achieved steps

1- validation of the relevance of the aspect of internationalisation they have to represent

Steps to be performed

2- More conceptual work needed from the experts to propose a relevant measure

3-4-5- The usual work to define the measure, check data availability, produce a precise definition

3 blue sky indicators (2)

Examples

F3: *International co-patenting* as a measure related to the contribution to international innovation of the research funded by FA

F8 : *Openness of funded programmes* to understand the extend to which national programmes are open to funding people working abroad

P7: *International use of own infrastructures* as an indicator related to the monitoring of openness of national research structures

5. Indicators based on the WoS new field “funding organisation” (1)

Questions which can be informed at the level of one organisation using bibliometric measures

- Does the FA stimulate international collaboration of researchers?
- Is the FA co-funding research?
- Is the FA funding research abroad? (openness of programmes)
- (Performers) Are some research outputs of a funded by foreign institutions?

Using of 2 fields on the WoS

- *Addresses of authors* : national versus foreign
- *funding organisation*: i) the FA considered, ii) other national funders, iii) European, iv) international funding

Indicators based on the WoS new field “funding organisation”(2)

International orientation of a funding agency

IO = (share of FA funded papers with international co-authors) /
(share papers with international co-authors in national output)

Example: SNF 2011

23,298 papers in 2011 with a Swiss address, among them

67.7% have international co-authors

5,608 acknowledge for SNF support, among them

59.7% have international co-authors

$$\text{IO} = 59.7 / 67.7 = 0.88$$

Level on internationalisation may differ per field (disaggregation by field)

Different hypotheses may be suggested to explain this figure

Indicators based on the WoS new field “funding organisation”(3)

International co-funded research

ICR = (internationally co-funded and co-authored papers / all funded papers)

Example: SNF 2011

Among the

5,608 SNF funded papers

1,249 were internationally co-authored and co-funded by one or more foreign public funders.

$$\text{ICR} = 1,249 / 5,608 = 22.3\%$$

If we exclude EC and ESF funding , this leaves only 1 028 papers with SNF and foreign public funding

$$\text{ICR}^* = 1\ 028 / 5\ 608 = 18.3\%$$

Indicators based on the WoS new field “funding organisation”(4)

Research funded abroad

$F8 = (\# \text{ papers with FA funding and no national authors} / \# \text{ all papers with FA funding})$

Output generated from budget coming from abroad

$P2 = (\# \text{ papers of the institution, with a foreign funder, no foreign author} / \# \text{ all papers from the institution})$

Indicators based on the WoS new field “funding organisation”(5)

Limitations and constraints

- WoS coverage, WoS online access needed
- not much information before 2011 available
- time lag between funding and publication

More work necessary

- **large disambiguation task:** ex. In Swiss papers 2011, 18 000 funders names, 154 names used for SNF, acknowledgement to a specific SNF instrument
- difficulty to **classify funders** : council, university, charity, company..
- need for comparative studies
- consider other entry than paper (researchers

6. Conclusions and recommendations (1)

A participative approach is efficient: it allows collective learning with benefits for users and experts

Indicators are relevant to assess the internationalisation of research institutions at the different levels where it may be implemented

→ a successful pilot study
... which deserves further work

7. Future of the forum (1)

Continuing the project means...

- completing the design and the description of the 17 indicators
- inciting and contributing to the harmonisation of classifications with other European groups (ex. mobility indicators with the Human Resources and Mobility group)
- organising coordination of the institutions who are willing to produce these indicators,
- opening the process to other institutions,
- exploring new approach for dealing with the impact of internationalization

Future of the forum (2)

Take advantage from the outcome of other projects how far they can be used for evaluation purposes...

- JOREP developed some concepts for data collection and for investigating the impact of trans-national research programmes using the concept of 'opportunities'
- ERA Monitoring and work on Openness and Integration of the European Research System in order to identify feasible measures
- POCARIM is supposed to develop some understanding of impact of PhD holders

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Experts essential contribution

Peter van den Besselaar, Annamaria Inzelt, Emanuela Reale

Other products beside this report :

- *Reale, E., Inzelt, A., Lepori, B. and van den Besselaar, P. (2011) ENID-STI Conference, Rome, September 2011.*
- *Reale, E., Inzelt, A., Lepori, B. and van den Besselaar, P. (2012) Research Evaluation, 21(4), 245-256.*
- *Van den Besselaar, P., Inzelt, A. and Reale, E. (2012) Proc. of 17th International Conference on Science & Technology Indicators 2012. Montreal, Science Metrix & OST*



THANK YOU FOR YOUR ATTENTION