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ROMANIAN RESEARCH ASSESSMENT EXERCISE (RRAE)

GENERAL ASSESSMENT METHODOLOGY

2010

Page 1

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Research Assessment and Support for Scientific Publishing



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1. Context, objective, results

Scientific research from higher education system is considered one of the pillars of the Romanian socio-economic development. The growing of the innovation capacity of the researchers, the capitalization of the teachers' and students' creativity by knowledge transfer, products and technologies towards the economic environment represent a determinant factor in the sustainable development of the country. By the specific of the assumed functions in the society, the universities are called to develop research programmes guided to new directions and priorities in sciences, to manage internal and external research networks, to promote excellency at the national and especially international level.

Romanian Research Assessment Exercise („RRAE” or „the exercise”) is done to deliver an appreciation instrument of the research quality from the Romanian universities and also one of the stimulation of its efficiency by real excellency schools – to the political decision makers, to the institutional structures and to the researchers.

1.1 Context

1.1.1 Promoter

Consistent to its mission of improving the quality of the university scientific research from Romania, National University Research Council („NURC” or „promoter”) – Executive Agency for Higher Education and Research Funding (EAHERF) coordinates the „Doctorate in Universities of Excellence – Research Assessment and Support for Scientific Publishing” strategic project, a project financed by The Sectorial Operational Programme for Developing of the Human Resources (SOPDHR).

The general objective of this project is the elaboration, the testing and the application of a methodology which assures the evaluation, at the international standards, of the research's quality from the universities, the supporting of the excellence schools and also the growing of the capacity of scientific publishing at the institutional and individual level, with an impact on the doctoral programme quality in the context of implementation, at a large scale, of the Bologna system and in that of the Romanian Admittance in The European Area of Research.

RRAE is, so, the essential component of the project which is developed by the NURC between 2008-2011, being the only one exercise of this type, which focuses on the *quality of the research* from the universities. For reaching this goal, the research quality's evaluation won't be an institutional one, at the university level, but it will be a thematical one, on the research domain (it can be seen in chapter 3).

1.1.2 What is it evaluated?

The actual exercise evaluates the research's performances from the Romanian universities, on the domains and also the environment where the research activity goes on. The assessment is done on the basis of four criteria (it can be seen in the subchapter 5.3), two of them regarding the individual dimension (I and III criteria), one of them – the institutional one (IV criterion), while II criterion is mixt, combining the previously announced dimensions.





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1.1.3 Who does evaluate?

To the evaluation exercise will take part the Romanian and foreign specialists (it can be seen at chapter 4). The evaluation of every file is done by three experts, for most of the domains, two of them being from abroad and one of them from Romania. The differences that could show up between the evaluations can be kindly solved, by their analysis in panel, according to the procedure instructions, presented in chapter 6.

1.1.4 Preliminary activities

The progress of the exercise was preceded by:

- The elaboration of a methodology and of the procedures set, which adapt the Romanian evaluation practices to the international ones. There were settled that four assessment criteria and the set of the afferent descriptors to each criterion. The descriptors were quantified in indicators according to the relations presented in chapter 5.
- The settling of the evaluation domains (it can be seen in chapter 3).
- The identification, by a process of transparent nomination/conomination, which is opened to the entire scientific community, that of the Romanian researchers who will form the experts group, used in the evaluation exercise. It was, also, settled the general list of the foreign experts who will take part to the evaluation exercise (it can be seen in chapter 4).
- The creation of an electronic platform, in order to support the progress of the exercise, by stocking, analysing and partial validating of data, and also by delivering of the detailed quantitative analysis.

An *International Steering Committee*, (see ANNEX I) validated all the necessary documents for the progress of the testing and for the real exercise's development. Its mission was that of assuring the corelation of the Romanian methodology of evaluation with the international practices from the domain.

1.2 The exercise's objective

The exercise's objective is the evaluation, at the international standards, of the scientific research from the Romanian universities.

For achieving this goal the exercise proposes itself to identify the domains where a certain university is competitive at the international level and to realise classifications of the universities from the country, on specialty domains. The analyse of the performance in each domain leads to a tinted representation of the research from a certain university, allowing the detection of the excellence's tops.

1.3 Results

RRAE results will allow pragmatics statements of politics, meaning the corelation of the value of research with the allocated funds, with the strategies of sustained development. The state will abandon the actual role of simple funds' distributor, becoming the one which makes investments-strategy in those universities, which satisfies the goal of performance. Such a perspective can just stimulate the interuniversitary competition, the participation of the Romanian researchers to the prestigious international networks of research, the increasing of the visibility and academic recognition in a global context.





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2. The general principles of the Exercise

Similar to the international exercises, the actual exercise of research's evaluation is based on ten general principles of deontologic and scientific nature:

- *The autonomy.* The Promoter (NURC) is the only one responsible for the produced reports. The promoter will lead, according to its own methodology, the entire exercise, having the expertise which guarantees the fiability of the procedures and results.
- *The impartiality.* The Promoter (NURC) isn't subjected to any influence, it doesn't matter its nature. So that, all the assessments will be done from equal positions, prevalent by the foreign experts, in order not to exist suspicions concerning the correctness of the results.
- *The competency.* The Promoter (NURC) defines and checks the evaluators' competence. The selection criteria are published, and also the lists of the Romanian and foreign experts, which lead the exercise.
- *Credibility.* The preliminary discussions showed that the evaluation methodology and procedure were accepted by all the partners involved in the exercise.
- *Colleague-like attitude („peer review“).* This principle exists both in the methodology and in the evaluation procedure.
- *Chances equity.* All higher education institutions from Romania have equal access to the actual exercise.
- *Transparency.* All the documents regarding the evaluation exercise are presented on the Internet and they are available to the public.
- *Consistency.* The evaluations must be consistent especially for the kindred domains, a reason for the indicators to be decided at the level of domains group.
- *The efficiency.* Due to the greater volume of information which must be processed, the evaluation process leans on an informatics platform.
- *Excellence.* According to the project objective the promoter puts this value in the centre of the entire exercise of evaluation.





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3. Domains' taxonomy

Specialty domains' taxonomy is a fundamental component of all the evaluation exercises. The classification is destined to offer a referential frame to the exercise, revealing affinities and kindreds between domains which must be consistently treated by the evaluators.

So, the members of the Romanian experts central panel (P0 panel, you can see ANNEX II) chose forty two specialty domains, as these totally reflect the major guide lines of scientific research and artistic creation from the universities from Romania.

The list of the evaluation domains was done starting, initially, from the thirty-seven doctoral domains of the National Council for Attestation of the University Titles, Diplomas and Certificates (NCAUTDC, it can be seen in ANNEX III), refined afterwards, by the project's management team and by P0 panel, by the comparative analysis of the fifty seven specialty domains, identified by NURC, in 2003 (it can be seen in ANNEX IV).

As a consequence of this analysis, were selected the evaluation domains, used in RRAE. The domains were validated firstly by the NURC members, in the Extended Executive Board, from 16-th of October, being approved afterwards by the members of the Academic community, in the Public Event of Validating the Methodology, from the 23-rd of October, 2009. Similar to the evaluation methodology, used in the *Research Assessment Exercise*, from The United Kingdom, the research domains were divided in six thematic groups, being appointed a coordinator for each group of domains.

3.1 The list of the evaluation's domains

Group I - Natural Sciences

1. Mathematics
2. Informatics
3. Physics
4. Chemistry
5. Geology and geography

Group II- Engineering Sciences

6. Civil engineering and installations
7. Mechanical engineering and mechatronics
8. Aerospace engineering
9. Transportation
10. Chemical engineering
11. Materials science
12. Oil, gas and mines
13. Industrial engineering
14. Electrical engineering
15. Energetics
16. Electronics and telecommunications
17. System engineering
18. Computers and information technology
19. Biotechnologies, food security and engineering
20. Environmental sciences





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Group III - Social and Economic Sciences

21. Law and administrative sciences
22. Economic sciences
23. Military sciences, security and information
24. Political sciences and international relations
25. Communication and media
26. Sociology, anthropology and social assistance
27. Psychology
28. Education science
29. Sports

Group IV - Human Sciences

30. Philosophy
31. History
32. Theology and religious studies
33. Philology

Group V - Arts and Architecture

34. Cinematography and performing arts
35. Music
36. Visual arts
37. Architecture and urbanism

Group VI – Life Sciences

38. Biology
39. Agriculture and forestry
40. Veterinary medicine and zootechny
41. Medicine
42. Pharmacology





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4. Evaluators' selection

For the selection of the Romanian evaluators who participate to RRAE, was created an electronic platform of nomination/conomination, on specialty domains, in the project, hosted at <http://conominare.ecs-univ.ro/>. This process took place in July-October 2009.

By this platform the members of the Romanian scientific community could propose important personalities of the scientific research and artistic creation, in order to bring them in the assessment domain.

For each domain, the management team selected a number of evaluators who received the invitation to take part at the nomination/conomination process, and then, after the registering on the platform, they could be able to propose, in their turn, other evaluators.

The final list of the Romanian evaluators who participate to RRAE was settled by the management team of the project together with The National Committee for Coordination, the coordinators of the forty two evaluation's domains, after the analysing the CV-s of al the experts who were registered on the nomination/conomination platform.

The nominal lists and the CV-s of the selected experts were published between 12-th of April and 21-st of May. The national scientific community could make appreciation on the proposed evaluators through this exercise. The final lists were established after these consultations.

The foreign evaluators who will be invited in RRAE were also settled by the management team of the project, taking into account the recommendations received from the International Committee for Coordination and also the lists of experts used by the *European Science Foundation (ESF)* and *Research Assessment Exercise (RAE)*, from the United Kingdom.





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5. The evaluation methodology: criteria, descriptors, indicators

5.1. Preamble

The elaboration of the evaluation methodology of the scientific research and artistic creation'quality from the Romanian universities, which is a base for the actual ROMANIAN RESEARCH ASSESSMENT EXERCISE was achieved between December 2008 and April 2010.

As was previously mentioned (it can be seen in subchapter 1.2), RRAE's goal is the classification, on specialty domains of the Romanian universities, according to the performances obtained in research and artistic creation, in order to improve the way of allocating the financial resources and to grow the competitiveness capacity of these- at the national and international level.

The general methodology of evaluation was elaborated by the Romanian experts panel (PO panel, it can be seen in ANNEX III), together with the management team of the project, after a comparative analysis of the national and international practice from the domain, between December 2008 and October 2009 (it can be seen in ANNEX IV).

At the same time, the specific methodologies, detailed presented in the six specific guides of evaluation, were elaborated between December 2009 and April 2010.

5.2 The methodology elaboration's stages

The first steps of the methodological approach were consisted in the elaboration of the reference terms of the evaluation exercise on the basis of the national and international experience from the domain, in the settle of the composition of the central panel of Romanian experts (PO panel, it can be seen in ANNEX II) and in the establishing of The International Committee for Coordination (it can be seen in ANNEX I).

On the basis of the comparative analysis of the national and international practice in the research's evaluation were settled four general criteria of evaluation (and the associated average weights), their respective descriptors and the maximum number of accepted indicators for each criterion.

Afterwards were settled the forty two evaluation domains, structured on six groups (it can be seen in chapter 3). After the elaboration of the taxonomy of the universe of the domains subjected to evaluation, the four criteria were debated in more workshops (it can be seen in ANNEX V), where a significant number of representatives from the university background from Romania were consulted.

Together with the forty two specialty domains, the methodology was presented at the international conference which took place on the 23-rd of October, in Aula Magna of the Academy for Economic Sciences from Bucharest. Over one hundred representatives of the Romanian universities and members of the International Committee of Coordination took part at the conference.





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5.3 Evaluation criteria

Starting from the comparative analysis of the international practices from the domain, the management team of the project and PO panel settled four general criteria of evaluation, having specific average weights:

- I. The results obtained in the activity of scientific research/artistic creation – 60-70%;
- II. The background of scientific research/ artistic creation – 10-30%;
- III. The prestige in the academic community – 5-15%;
- IV. Financial resources brought for the scientific research/ artistic creation – 5-10%.

Taking into account the particularities of the evaluation domains it was established that these criteria not to have a fix and an equal weight, in order to assure the equality of chances for the evaluated domains. The weight of minimum 60% given to the scientific production /artistic creation is due to the importance of this criterion in all the analysed evaluation exercises.

Afterwards a preliminary list of the descriptors for each criterion was settled and the maximum number of indicators taken into account for each criterion was mentioned.

The evaluation criteria and the set of their respective descriptors were validated in some workshops organised in the universities from Bucharest, Iași, Cluj and Timișoara between April-September 2009 (it can be seen in ANNEX V).

5.4 Descriptors' used in the evaluation

The list of the descriptors was finished by the members of PO panel, the members of the International Committee for Coordination and by the team management of the project.

CRITERIA	DESCRIPTORS
<p>I. The results obtained in the activity of scientific research/artistic creation</p> <p>(60 – 70 %)</p> <p>Maximum 3 indicators</p>	<ul style="list-style-type: none"> ▪ Articles: <ul style="list-style-type: none"> • Publications rated <i>Web of Science</i>; • Magazines from international data base. ▪ Scientific books of author ▪ Patents ▪ Other achievements subjected to the author's right law and to the auxilliary rights, which imply the creation as a process of research and innovation in architecture and arts domains ▪ Products and/or innovative services with an economic impact which can be proved
<p>II. The background of scientific research/ artistic creation</p> <p>(10 – 30 %)</p> <p>Maximum 4 indicators</p>	<ul style="list-style-type: none"> ▪ PhD advisers ▪ The organising of scientific events and artistic creation of international level ▪ The existence of some proper mechanisms for bringing of the young researchers ▪ The financial support of the university for the research in the priority assumed domains, by strategies at a national level ▪ Investments programme for laboratories/workshops, which are equipped with an infrastructure specific to the scientific research/artistic creation ▪ The capacity of the university to assure the acces to the specialty





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literature

III. The prestige in the academic community

(5 – 15 %)

Maximum 3 indicators

- Papers invited to the famous international conferences
- Visiting professor at the famous universities
- Leadership positions in international professional organisations
- Translations of proper scientific contributions, published by publishing houses from abroad
- Quatations and reviews of the author's creation
- Member of Romanian Academy, of the specialty academies of the academies from abroad
- Member in the *boards* of some magazines which are rated *Web of Science*

IV. Financial resources brought for the scientific research/ artistic creation

(5 – 10 %)

1 indicator

- Funds brought for the research:
 - by national competitions;
 - by international competitions;
 - by direct contracts with third persons;
- Funds brought from services/innovative/creative products

5.5 Indicators used in the evaluation

The quantification of the discussed descriptors in subchapter 5.4 is done by a set of formula elaborated by the management team of the project and by the coordinators of the forty two specialty domains, on the basis of the national and international experience in the research evaluation. The indicators resulted this way contain two different levels of evaluation, a quantitative and a qualitative one. The quantitative evaluation is realised automatically by the informatics platform, on the basis of the information contained in the assessment file, while the qualitative one is realised by the evaluating experts on the basis of the analysed documents.

The evaluation of the respective files of a certain domain is done as it follows: the universities' files are evaluated on each criterion. To each criterion is allocated a maximum number of points (settled by the panels, on domains' groups, according to the table bellow). The maximum score on a certain criterion will be given to the file which obtained the best result according to the evaluation formula/grid. The other files receive a score proportional to the obtained result. The total score of a file is calculated by adding the scores obtained to the four criteria.

	PGD I	PGD II	PGD III	PGD IV	PGD V	PGD VI
Criterion I	70 points	65 points	60 points	60 points	60 points	60 points
Criterion II	10 points	20 points	15 points	15 points	30 points	20 points
Criterion III	10 points	5 points	15 points	15 points	5 points	10 points
Criterion IV	10 points	10 points	10 points	10 points	5 points	10 points



Criterion I – The results obtained in the activity of scientific research

For the quantification of a criterion I's descriptor (for one university, on one domain), are added the results of the research afferent to the descriptor, weighted depending on the number of authors of each element of the sum and on the associated factor of impact. The result obtained this way is multiplied with a quality factor, allocated by the evaluators on the basis of *peer review* analysis of a representative part of the scientific production and is weighted depending on the number of researchers of the university from that domain.

For example, for „scientific articles” descriptor, the indicator is calculated this way:

$$I_{\text{articles}} = \frac{N_{c, \text{ev}}}{N_{c, \text{tot}}} F_{c, a} \sum_{\text{articles}} F_{i, a} \frac{N_{a, u}}{N_a}$$

- The sum (Σ) contains all the articles of one university on a specific domain
- $N_{c, \text{ev}}$ represents the number of the evaluated researchers from that domain (with a work contract at the 31-st of December, 2010)
- $N_{c, \text{tot}}$ represents the total number of researchers and didactic staff from the evaluated domain (with a work contract at the 31-st of December, 2010)
- N_a represents the total number of the authors of an article
- $N_{a, u}$ represents the numbers of authors of an article from the evaluated university (with a work contract at the 31-st of December, 2010)
- $F_{i, a}$ represents the impact factor of the magazine. Depending on the evaluation domain the impact factor is either Thomson ISI factor or (where Thomson ISI factor is irrelevant) a value chosen depending on the impact in the community of the magazine where a certain article was published.
- $F_{c, a}$ represents the quality factor of the evaluated articles and is determined by a *peer review* analysis of the representative articles of the researchers of one university which activates in a specific domain.

The evaluated articles represent a specific percentage from the scientific production, following that this to be settled for each domain. We mention that every researcher introduces on the evaluation platform the identification data of the scientific articles published in the last five years, the responsible of the university on that domain being the one who is going to load the electronic variant of the representative articles on the evaluation platform (e.g., in PDF format).

The allocation of the numerical value of the quality factor is done on the basis of the following four general levels, the evaluator showing for each level the proper percentage from the analysed scientific articles.

- **Top international level**, $F_{c, a} = 1,2$, reflected by:
 - Scientific production which imposes actual research directions in a domain
 - Vanguard scientific production
 - Scientific production which leads to a new way of thinking or to the apparition of new techniques
 - Scientific production which has a major influence on the domain
 - The development of the new paradigms or new concepts in the research
- **International level**, $F_{c, a} = 1$, reflected by:
 - Scientific production which brings contributions of international level in that domain

- Contributions to the knowledge, ideas and techniques which can have a long term impact, but they don't develop new paradigms and they don't lead to new fundamental concepts
- **National level**, $F_{c,a} = 0,9$, reflected by:
 - Scientific production which brings useful information in that domain, without having a long term impact
 - Contributions to the knowledge, using techniques and approaches which are in the current use or which are in accordance with the existent ideas and paradigms
- **Local level**, $F_{c,a} = 0,7$, reflected by:
 - Common scientific production, with a negligible impact on the domain

The indicators associated to the other descriptors of the criterion I are similar to the indicator for „scientific articles”.

Criterion II – The background of scientific research

The quantifying of each descriptor afferent to the criterion II implies a quantitative evaluation, automatically realised by the electronic platform, on the basis of the registered information (by an university, on a specific domain), weighted by a qualitative factor allocated by the evaluators.

For example, the „PhD advisers” descriptor is quantified by:

$$I_{\text{PhD advisers}} = \frac{N_{c,c}}{N_{c,\text{tot}}} F_{c,c}$$

where

- $N_{c,c}$ represents the number of the PhD advisers of one university, in a certain domain (with a work contract at the 31-st of December, 2009)
- $N_{c,\text{tot}}$ represents the total number of researchers from a certain domain (with a work contract at the 31-st of December, 2009)
- $F_{c,c}$ represents the quality factor of the PhD advisers of one university, in a special domain (with a work contract at the 31-st of December, 2010)

The allocation of the numerical value of the quality factor is done on the basis of the following four general levels, the evaluator indicating the percentage from the number of the PhD advisers analysed from each level.

- **Top international level**, $F_{c,a} = 1,2$
- **International level**, $F_{c,a} = 1$
- **National level**, $F_{c,a} = 0,9$
- **Local level**, $F_{c,a} = 0,7$

The representative elements for these levels are defined, at a specific level, in the six domains' groups and they are presented in the specific guides.

The indicators associated to the other descriptors of the criterion II are similar to the indicator for „PhD advisers”.

Criterion III – The prestige in the academic community

The allocation of the quality factors for the prestige in the academic community of the personnel of one university is done on the basis of the individual charts. The evaluator indicates for each level from the four of them, detailed bellow, the proper percentage from the analysed charts.

- **Top international Prestige**, $F_{c,r} = 1,2$, reflected by:
 - The most important prizes and distinctions in the domain (Nobel prize, Domains medal, etc.)
 - Member of some prestigious academies (e.g., *Accademia Europea*)
 - *Honoris causa* doctorates from behalf of some prestigious universities
 - Member in the management team of some prestigious professional associations (e.g., *American Physical Society, American Chemical Society* etc.)
- **International Prestige**, $F_{c,r} = 1$, reflected by:
 - International distinctions (e.g., prizes on behalf of international professional associations)
 - Visiting professor at prestigious universities
 - Invited papers at prestigious conferences
 - Quatations of scientific production
- **National Prestige**, $F_{c,r} = 0,9$, reflected by:
 - Correspondent member of the Romanian Academy
 - National distinctions (e.g., Romanian Academy prizes)
 - Member in the management team of some national asociations (e.g., *Romanian Society of Physics*)
- **Local Prestige**, $F_{c,r} = 0,7$, reflected by:
 - Local distinctions

Criterion IV – Funds brought for the scientific research

For the quantifying of the descriptor afferent to the criterion IV (for one university, on a domain), the following productivity indicator is used:

$$I_{\text{funds}} = \frac{1}{N_{c,\text{tot}}} \left[\sum_{\text{national contracts}} V \frac{N_{g,u}}{N_{g,\text{tot}}} + 5 \sum_{\text{international contracts}} V \frac{N_{g,u}}{N_{g,\text{tot}}} \right]$$

- The sums contain (Σ) all the contracts (national and international ones) of one university on a certain domain
- $N_{c,\text{tot}}$ represents the total number of the researchers from the university from a certain domain (with a work contract at the 31-st of December, 2010)
- $N_{g,u}$ represents the number of the universities' researchers from that domain, included in a certain research contract (with a work contract at the 31-st of December, 2010)
- $N_{g,\text{tot}}$ represents the total number of the universities' researchers included in a certain research contract (with a work contract at the 31-st of December, 2010)
- V represents the incomes incumbent to the universities (in RON) from a certain research contract.

The weight 1:5 between the national and international contracts makes the qualitative distinction between the two types of contracts.

6. The evaluation procedure

The evaluation of the research's and artistic creation quality from the Romanian universities will go on according to the following procedure:

- I. Every university selects – from the complete list of the forty two specialty domains – the domain/domains represented in the university, every researcher and didactic staff of one university being integrated in one evaluation domain.
- II. It will be done an evaluation file for each domain.

The evaluation file has the following structure:

- the name of the research domain and the list of the subdomains of research which are covered;
 - the list of the research personnel who activates in that domain;
 - the identification data of the research results;
 - the representative scientific production;
 - information on the human resources, research infrastructure, research background and brought funds;
- III. The loading of the files on the evaluation's electronic platform.
 - the articles are loaded in an electronic format, being mentioned the impact factor Thomson ISI of the magazine where they were published (if there is one) and also the documented number of quotations (if there are some);
 - the books are loaded in an electronic format, together with the complete data for reference;
 - for patents, productions and technologies is filled up a description in English of the patent/product/technologies;
 - the complete files of one university, on one domain is generated by the electronic platform after all the data were introduced (the eligibility of the file is implicit: it won't be printed from the platform if there aren't filled up all the domains); the centralizer of the printed file is signed by the legal representative of the university;
 - the files are loaded on the university's *site*, also.
 - IV. The checking of the data comprised in the evaluation's files. Resending- to the universities-the files which contain the wrong information.
 - V. The analysis of the files.

Stage I

- Every member of the panel has access – on the basis of a user name and password- to Web platform where all the evaluation files from a certain specialty domain are loaded in electronic format. For most of the domains the analysis of a file is realised by three members of the panel: a Romanian evaluator and two foreigners. The allocation of the files in order to be analysed is done randomly, taking into account the avoiding of the situations of interests' conflict, focusing on the fact as every member of the panel to receive for evaluation the same number of files.

Stage II

- The meeting of the panels on the specialty domains in order to analyse and validate the results. The individual evaluation's results (from **stage I**) are analysed in the plenum of each



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panel, the presentation being done by one of the three evaluators. In this stage are solved the eventual non concordances occurred between the three experts' evaluations.

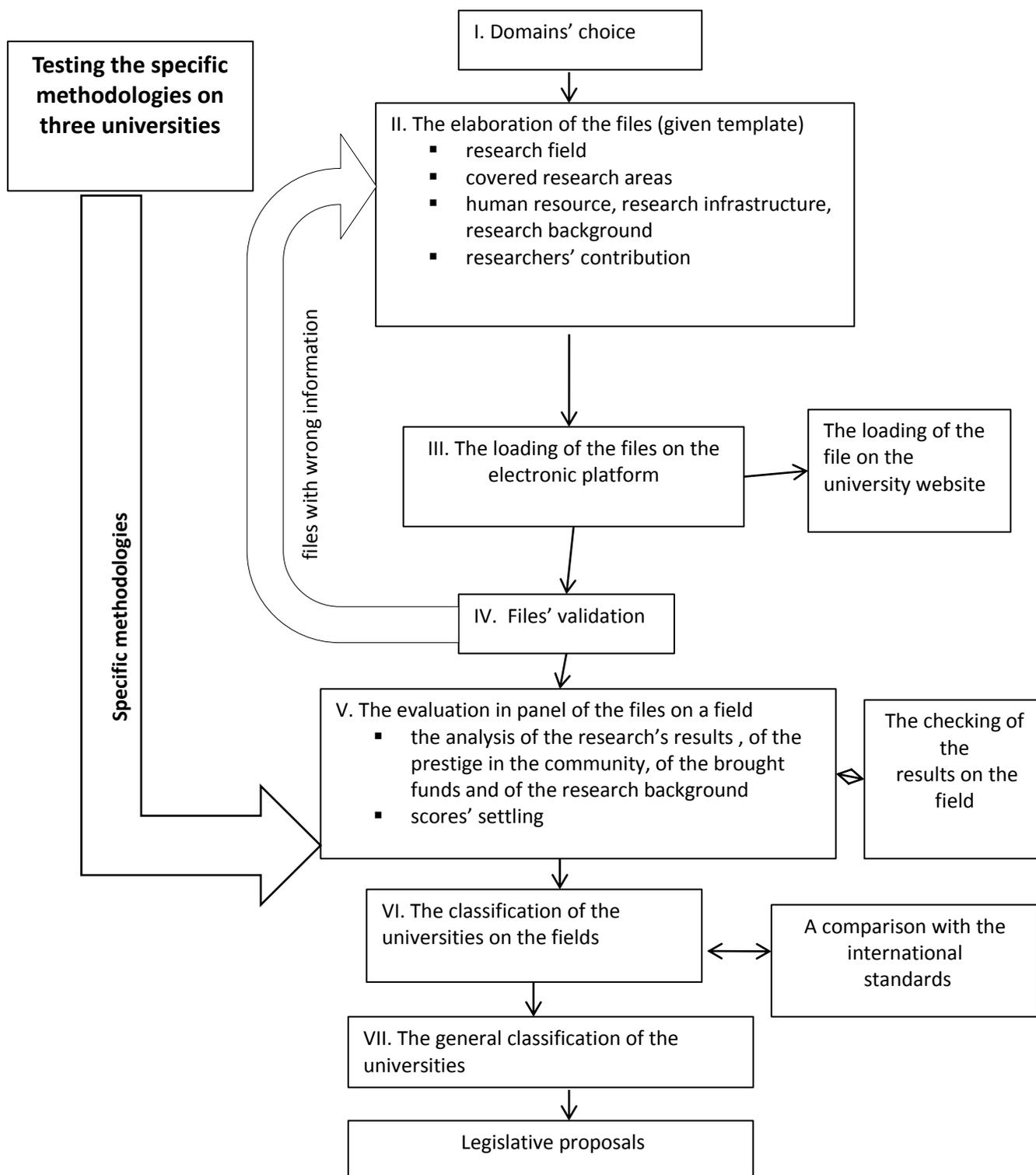
- In order to clarify the vaguenesses, the coordinator of the panel can contact the representative from the university, who is in charge for the respective domain or he can request to pay a visit on the domain.

VI. At the end of the evaluation process, every panel validates the results and settles a classification of the universities on that domain. The comparison with the international standards will be done – on each domain- by the specialty panel.

VII. On the basis of the classification of the panels on the domains is achieved a general classification of the universities depending on the scores obtained by each analysed specialty domain.

We present below the diagram of the entire evaluation process.







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7. The evaluation's reports

ROMANIAN RESEARCH ASSESSMENT EXERCISE

CARD FOR QUALITATIVE EVALUATION AT „NATURE SCIENCES”

Identification data (university)

Name of the evaluated university:

Name of the evaluated domain:

Identification data (evaluator)

Evaluator's name and forename:

Didactic and/or scientific title:

Institution:

Criterion I – Scientific production

Scientific articles

Quality factor (in percentages):

Local:	National:	International:	Top international:
--------	-----------	----------------	--------------------

Reasoning:

Books and chapters of books

Quality factor (in percentages):

Local:	National:	International:	Top international:
--------	-----------	----------------	--------------------





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Reasoning:

Patents

Quality factor (in percentages):

Local:	National:	International:	Top international:
--------	-----------	----------------	--------------------

Reasoning:

Criterion II – Research background

PhD advisers

Quality factor (in percentages):

Local:	National:	International:	Top international:
--------	-----------	----------------	--------------------

Reasoning:

The capacity of the university to assure the access to the specialty literature

Quality factor (in percentages):

Local:	National:	International:	Top international:
--------	-----------	----------------	--------------------

Reasoning:



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The existence of its own mechanisms to bring young researchers

Quality factor (in percentages):

Local:	National:	International:	Top international:
--------	-----------	----------------	--------------------

Reasoning:

Investments' programme for laboratories/workshops equipped with an infrastructure specific to the scientific research

Quality factor (in percentages):

Local:	National:	International:	Top international:
--------	-----------	----------------	--------------------

Reasoning:

Criterion III – The prestige in the academic community

Quality factor (in percentages):

Local:	National:	International:	Top international:
--------	-----------	----------------	--------------------

Reasoning:



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8. Glossary

In this section are mentioned the meanings of the main terms used for the application of the present guide.

Published article: a document published by the author/authors. In this case are taken into account the articles published in ISI magazines or those which are indexed in prestigious international data bases.

Invention Patent : a title of protection which offers to the titular an exclusive right of exploitation of the invention's object and also the right of forbidden to third persons (physical or legal persons) to exploit the invention's object.

The university's capacity to support postdoctoral programme: the existence of the human and financial resources at the university level and of a postdoctoral programme, also.

Scientific book of author: a book written on the basis of proper scientific activity. The didactic papers are excluded.

Research: a creative activity which brings a contribution to knowledge, understanding and innovation, having a socio-economic relevance.

Researcher: he/she is the person involved in the conceiving or creating of the new knowledge, products, processes, methods and systems and also in their management. The definition refers to any person who is professionally involved in the research-development activity, in any stage of his/her career, it doesn't matter the classification. This includes any type of research: basic, strategic, applied one, experimental development and transfer of knowledge, innovation and counselling, supervising and instruction abilities, knowledge and rights of intellectual property management, the exploitation of the research's results or scientific publishing.

The researcher subjected to RRAE evaluation: he/she is the person employed with his/her basic function (with a work contract) in the university, at 31-st of December, 2009.

Doctorate mentor: he/she can be an academician, a correspondent member of the Romanian Academy, a professor or a scientific researcher who has 1-st degree, who obtained the legal right of mentoring doctoral students.

Evaluation criteria: on these principles is done the classification of the universities from Romania as far as the research activity concerns. In the actual methodology four criteria for the research evaluation from universities are taken into account.

The evaluation's domain: it is one of the forty two research's domains described in this guide

ROMANIAN RESEARCH ASSESSMENT EXERCISE (RRAE or „the exercise“): an instrument for measuring the research's quality from the universities of Romania and also for stimulating its efficiency in the excellency schools.

Quality factor: a factor settled by the evaluator experts on the basis of the qualitative analysis of the documents from the evaluation file.

Impact factor: an average number of quotations- on a year- of the articles published by the researcher in the previous two years.





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Evaluation indicator: the form of a descriptor which was numerically quantified.

Innovation: an activity which is oriented towards the generation, assimilation and capitalization of the research-development's results in the economic and social environment.

Invited papers to prestigious international conferences: papers which were presented at the international conferences and they were published in the documents of the respective conferences.

Proper mechanisms of bringing the young researchers: the existence of some proper instruments at the university's level (for example: research programmes) and financial facilities dedicated to the young researchers.

The methodology of research's evaluation: an assembly of procedures (information and integrated procedures) used in the achieving of the research activity's evaluation on scientific domains, from the Romanian universities.

Products and innovative services: products/services with an economic impact which can be proved by the effects produced by their application.

Visiting professor at the prestigious universities: visiting professor to a prestigious university for a long term stage.

Achievements subjected to the author's right law and that of the auxilliary rights: achievements referring to the creation, defined as a process of research and innovation in the domains like: architecture and arts.

Research's results: the contribution to knowledge, understanding and innovation, with a socio-economic relevance





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10. Annexes

ANNEX I

International Steering Committee

Professor Karel AIM, Ph.D. – *Institute of Chemical Process Fundamentals, Academy of Sciences of the Czech Republic, Czech Republic*

Professor Dieter IMBODEN, Ph.D. – *Eidgenössische Technische Hochschule Zürich, Switzerland*

Professor Hans Peter JENSEN, Ph.D. – *Egmon H. Petersons Kollegium, Denmark*

Professor László KEVICZKY, Ph.D. – *Hungarian Academy of Sciences, Hungary*

Professor Tadeusz LUTY, Ph.D. – *Institute for Physical and Theoretical Chemistry, Wroclaw University of Technology, Poland*

Professor Marja MAKAROW, Ph.D. – *European Science Foundation*

Professor Par OMLING, Ph.D. – *Swedish Research Council, Sweden*

Professor Cem SARAC, Ph.D. – *Turkish Academic Network, Turkey*





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ANNEX II

The Romanian experts' panel (P0)

Professor Dorel BANABIC, Ph.D. – Technical University of Cluj-Napoca

Professor Daniel DAVID, Ph.D. – „Babeş-Bolyai” University, Cluj-Napoca

Professor Dalina DUMITRESCU, Ph.D. – The Academy for Economic Sciences , Bucharest

Professor Mircea FLONTA, Ph.D. – University of Bucharest

Professor Radu GOLOGAN, Ph.D. – Politechnics University from Bucharest

Professor Octavian POPESCU, Ph.D. – „Babeş-Bolyai” University, Cluj-Napoca

Professor Adrian TITIENI , Ph.D. – National University of Theatrical and Cinematographic Art





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ANNEX III

The list of the doctorate domains of CNATDCU

1. Mathematics and Informatics
2. Physics
3. Chemistry
4. Biology
5. Geography, Geology and Environment Sciences
6. Philology
7. Philosophy
8. History
9. Theology
10. Legal and Administrative Sciences
11. Sociology and Social Assistance
12. Political Sciences, Sciences of Communication and Media
13. International Relations and Cultural Studies
14. Psychology and Educational Sciences
15. Economy
16. Finances and Accountability
17. Economy and International Business
18. Cybernetics, Statistics and Economical Informatics
19. Management and Business Administration
20. Marketing
21. Theatre and cinematography
22. Music
23. Plastic and Decorative Arts
24. Architecture and Urbanism
25. Agriculture and Forestry
26. Veterinary Medicine
27. Civil and Installations Engineering
28. Mechanical Engineering
29. Aerospace Engineering, Vehicles and Transportations
30. Chemical Engineering and Science of Materials
31. Mines, Petroleum and Gases
32. Industrial Engineering
33. Electric Engineering, Electronics and Telecommunications
34. Systems Engineering, Computers and Information Technology
35. Military Sciences and Information
36. Medical Sciences
37. Pharmaceutical Sciences





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ANNEX IV

List of specialty's domains of NURC (2003)

1. Mathematics
2. Physics
3. Chemistry
4. Informatics
5. Biology
6. Geography
7. Geology and Geophysics
8. Science of Environment (Ecology)
9. Philosophy
10. History (Archivistics, Art's history, Museology, Preservation, Restauration)
11. Philology (Bibliology)
12. Theology and Religious Studies
13. Psychology
14. Pedagogy (Special Psychopedagogy)
15. Sociology (Social Assistance)
16. Political Sciences (International Relations and European Studies)
17. Administrative Sciences
18. Communication Sciences (Journalism, Cultural Studies, Social Communication and Public Relations)
19. Anthropology (Ethnology)
20. Law
21. Economy
22. Cybernetics and Economic Statistics
23. Finances. Banks.
24. Accountability
25. International Economic Relations
26. Management (Marketing, Business Administration)
27. Agriculture
28. Horticulture
29. Sylviculture
30. Zootechny
31. Biotechnologie
32. Veterinary Medicine
33. Medicine
34. Stomatology
35. Pharmacy
36. Architecture and Urbanism
37. Visual Arts
38. Music
39. Theatre and Coreography
40. Cinematography and Media
41. Physical Education and Sport (Kinetotherapy)
42. Mechanical Engineering
43. Electric Engineering
44. Electronic Engineering and Telecommunications
45. Science of Materials
46. Buildings Engineering (Geodezy, Corps Engineering, Installations)





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47. Industrial Engineering
48. Chemical Engineering
49. Mines, Petroleum and Gases
50. Computers Science
51. AutomaticS
52. Energetics
53. Wood's Industry
54. Food Industry
55. Air, Naval, Railway and Road Transports
56. Military Sciences
57. Military Art





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ANNEX V

The list of the workshops

1. University of the Agricultural Sciences and Veterinary Medicine, Bucharest
The date of the workshop: 14-th of July, 2009
Number of participants: 63
2. „Gheorghe Asachi” University, Iași
The date of the workshop: 15-th of September, 2009
Number of participants: 101
3. „Politehnics” University of Timișoara
The date of the workshop: 18-th of September, 2009
Number of participants: 84
4. „Babeș-Bolyai” University, Cluj-Napoca
The date of the workshop: 21-st of September, 2009
Number of participants: 119
5. Petroleum and Gas University of Ploiești
The date of the workshop: 22-nd of September, 2009
Number of participants: 22
6. Bucharest University
The date of the workshop: 28-th of September, 2009
Number of participants: 227
7. „Politehnics” University from Bucharest
The date of the workshop: 30-th of September, 2009
Number of participants: 76





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ANNEX VI

National and International Experience

I. National experience

IC6 quality indicator measures the level of performances in the university research from Romania, being the only one which refers to its quality. IC6 evaluations are run by The National University Research Council (NURC), having a complex structure and a distinctive calculation formula, comparing to the other indicators. For 2009, National Council for Higher Education's Financing (NCHEF) proposes the maintaining to the 7% from the total of the weight for this indicator, under the circumstances like the strategic directions from the national and European level support in the present the superior cycles of studies (master and doctoral programmes), these being the direct beneficiaries of the university scientific research's results.

NURC proposal for 2009 follows five general criteria of appreciation of performance in the university scientific research on the basis of its own methodology:

1. The capacity of bringing funds for research (25%)
2. The capacity of training the human resource for the research (10%)
3. The results' relevance and visibility (50%)
4. The capacity of conceiving/developing innovative technologies-products (10%)
5. The capacity of organising and supporting the research activity (5%)

We present below the detailed structure of the IC6 quality indicator regarding the performances of the university scientific research on the basis of the new NURC proposal.

Name	Weight from IC ₆	Weight from the basic financing
1. The capacity of bringing funds for research	25%	1,75%
1.1 The initiative of bringing research funds at the national and international level	4%	0,28%
1.2 Projects won in national and international competitions	6%	0,42%
1.3 Funds brought from national and international competitions by research projects/grants, technical and technological expertise/services (national or international, including those directly signed with companies from country and abroad)	15%	1,05%
2. The capacity of training the high qualified for scientific research human resource	10%	0,70%





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2.1 The degree of involvement in the training of the high qualified for scientific research human resource	4%	0,28%
2.2 The efficiency in the training of the high qualified for scientific research human resource	6%	0,42%
3. The relevance and visibility of the scientific research activity results	50%	3,50%
3.1 Articles published in magazines which are recognised at an international level – rated ISI <i>Web of Science</i> , from the main flow of publications without an impact factor, BDI indexed, published in the volumes of the international conferences which are rated ISI and/or those which are organised by international professional societies	30%	2,10%
3.2 Articles published in magazines which are recognised at a national level, by NURC, those of B and B+ categories	10%	0,70%
3.3 Books published in national and international publishing houses (electronic format and/or paper)	10%	0,70%
4. The capacity of the universities to conceive/develop innovative technologies-products for the business environment	10%	0,70%
5. The institutional capacity of the universities to organise and support the performant scientific research activity	5%	0,35%

The IC6 methodology of evaluation is an institutional one, following the calculation of the quality indicators for every university, starting from the parameters' values which enter into the formulas. According to the rules, each evaluated university can send just one file where there are described the research's performances, taking into account the five general criteria previously presented.

IC6 results obtained in 2008 by each university, with the score afferent to each indicator, are available on www.cncsis.ro/rezultate_IC8.php.





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II. International experience

On the basis of the report on the international practice PO panel and the management team identified the exercises which have as a goal the evaluation of the university scientific research's quality, in order to correlate the research's financing from public funds with the quality of the scientific production.

We briefly present as it follows the evaluation's exercises which were done in The United Kingdom of Great Britain and North Ireland (*Research Assessment Exercise – RAE*), New Zealand (*Performance Based Research Fund – PBRF*), Australia (*Research Quality Framework – RQF*) and Germany (*Exzellenzinitiative*).

Country:	The United Kingdom of Great Britain and North Ireland
Evaluation exercise:	<i>Research Assessment Exercise – RAE</i>
Evaluating institution:	Partnership formed by <i>Higher Education Funding Council for England, Scottish Funding Council, Higher Education Funding Council for Wales</i> and <i>Department for Employment and Learning</i> from North Ireland
The evaluation's objective:	The classification of the universities on research domains in order to finance the excellency in research
The evaluation criteria:	<p>1. The result of the scientific research (minimum 50%)</p> <p>An evaluation on a five steps scale:</p> <p>4* – quality research of <i>world-leading</i> level</p> <p>3* – quality research of <i>internationally excellent</i> level</p> <p>2* – quality research of <i>internationally recognised</i> level</p> <p>1* – quality research of <i>nationally recognised</i> level</p> <p>Unevaluated – research to which quality is under the <i>nationally recognised</i> level</p> <p>2. The research background (minimum 5%)</p> <ul style="list-style-type: none"> • The figures of schooling for the students involved in the research • Personnel politics, <i>i.e.</i>, the support of the young researchers and the professional reintegration after a long absence • Research strategy (including <i>visiting programmes</i>, international collaborations etc.) <p>3. Scientific prestige (minimum 5%)</p> <ul style="list-style-type: none"> • The number of articles invited at the conferences • The number of prizes and distinctions • The quantum of the research's funds • The number of <i>chairman</i> positions at the events out of the institution • The number of invitations to the publishing of some books and magazines • The number of books translated in other languages • The number of <i>visiting professor</i> positions
The evaluation methodology:	In <i>RAE 2008</i> the assessment was a <i>peer review</i> type in 67 specialty sub-panels, structured on 15 panels. The previous exercise, <i>RAE 2001</i> , used





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also a *peer review* type evaluation, but on 69 specialty domains.

Country:

Evaluation exercise:

Evaluating institution:

The evaluation's objective:

The evaluation criteria:

New Zealand

Performance based research fund – PBRF

Minister of Tertiary Education

The classification of the universities in order to finance the excellence in research

1. The scientific production – 70%

The scientific production is of two types: *i.*) guaranteed quality (*quality assured research output*) and *ii.*) no guaranteed quality (*non-quality assured research output*). In the first category are included the papers (in an extended meaning) which have already received the recognition of the quality from community (*e.g.*, by publishing in the magazines with *peer review*, public dissemination etc.), while the second category comprises the papers which either weren't given to the scientific circuit (*e.g.*, manuscript) or they were rejected by the community (*e.g.*, articles rejected by the magazines with *peer review*).

2. The prestige in the community – 15%

The prestige in the community is evaluated depending on the research scholarships, prizes, invitations to international events, quotations and favourable references, specifying that isn't necessary an indicator of the prestige in the community.

3. The contribution to the research background – 15%

The role of the researcher in the dynamics of the research background is analysed depending on its administrative functions, its contribution to the young researchers' development, its participation to the international conferences, the funds bringing, the organising of some scientific events

The evaluation methodology:

The evaluation in panel of the files of each researcher.

Country:

Evaluation exercise:

Evaluating institution:

The evaluation's objective:

The evaluation criteria

Australia

Research Quality Framework – RQF

Department of Education, Employment and Workplace Relations

The measurement of the quality and of the impact of the research from public funds for the achievement of some optimum investments

1. Excellence research

- Bibliometric indicators
- The number and the quantum of grants obtained by competition
- The number of postdoctorate researchers
- Indicators of valuable ones, *i.e.*, member of some societies, *keynote speaker* invitations, the inclusion in the editorial *board* of some prestigious magazines



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2. The academic and socio-economic impact of research

- The number of magazines with a high level of impact
- The number of articles from the magazines with a high level of impact
- Patents
- The value of the research which is financed from the contracts with the industrial background
- The articles published in the press of scientific dissemination
- The number of researcher-students hired in the governmental departments, ministry departments and industry

The evaluation methodology:

An evaluation on specialty domains, in experts' panels (national and international ones) and *end-users* who verify the impact of the research.

Country:

Germany

Evaluation exercise:

Exzellenzinitiative

Evaluating institution:

Deutsche Forschungsgemeinschaft (The German Foundation for Science) together with The German Scientific Council

The evaluation's objective:

The promotion of the excellence research

The evaluation criteria

For every line of financing:

1. Schools for doctoral students

- The background of research and training of the young doctoral students
- The training process of the young doctoral students
- The institutional structure

2. Excellence clusters

- The research
- The human resources
- The structure

3. Institutional strategies for advanced research in universities

- The practice of the excellence scientific research in different scientific domains
- The increasing or the maintaining of a high standard of the research
- The increasing potential of the competitiveness at the international level in the future

The evaluation methodology:

The evaluation in the panel of experts

