The Audit of Innovative Enterprises (Universities) in Educational Management

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Abstract
If a university, due to the nature of its activities (teaching and search activities), organization, structure and functionality specific purpose for which they were established mainly with direct educational development and the other two components of the knowledge triangle: research and innovation.

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General considerations
If a university, due to the nature of its activities (teaching and research activities), organization, structure and functionality specific purpose for which they were established mainly with direct educational development and the other two components of the knowledge triangle: research and innovation.

The model innovation assessment for universities
Given that the size of a university innovation is a complex process, given that you cannot establish uniform evaluation criteria which are associated to a system of specific indicators in this regard, for these problems has also taken proposed development of a multi criteria evaluation model (Fig. 1.1).

To get an overview of innovation at a university level to develop a proposed assessment model based on five key components of innovation (potential driving innovation, knowledge creation potential, ability to integrate a relational system, the ability structuring activities and ability to exploit intellectual property), with direct implications for sustainable development of the university, which are associated evaluation criteria. It envisages a set of criteria associated with each component of innovation so that, for each criterion, to identify indicators of characterization. For each indicator, criteria, component is given a number of points depending on their degree of achievement of RDI.
compared with other centers within the university. Scoring system operates at between 1 to 10, which granted the degree of fulfillment of each criterion after analyzing indicators associated to each criterion.

For each component subject to evaluation, is assigned a weighting. Also, for each criterion is assigned a coefficient of importance, so that the weighting coefficient associated with the innovation component to represent the sum of the coefficients of importance associated criteria established for that component. Group evaluation components and associated weighting coefficients, system criteria, indicators and associated criteria importance coefficients, the system of evaluating the criteria, and recommended measures to improve the assessment of a criterion may be a model for establishing the degree of innovation at a university. To determine the degree of innovation was at a university developed a model based on key components of innovation (eg potential driving innovation, knowledge creation potential, ability to integrate a relational system, ability to structure activities capability to exploit the intellectual property, etc..) with direct implications for sustainable development of the university, which are associated criteria and indicators of innovation. Innovation indicators, such as sustainable, it must be consensual and give a representative picture of the three dimensions of sustainable development: society, economy and environment. Equally, it is necessary that they should be very clear, robust and statistically viable, be prepared from the best sources of data sources to be harmonized in terms of methodology with international standards, to be comparable with EU Member States and to provide comparability with international standards used by the United Nations and OECD. At the same time, these indicators should be able to obtain timely and easy to be revised to update them. In order to build a system of indicators of innovation research has been undertaken on the types and categories of indicators used by
international organizations (Eurostat, World Bank, UN, OECD, etc.) For comparative studies and international rankings. Sources of relevant quantitative statistical data collection about the innovation process at a university are: reports of activity in research, development and innovation (RDI) existing at a university (faculties, departments, research centers), The Economic and financial, human resource managers, record the results of RDI, etc. Management of RDI.

The downside of deploying an innovation indicators and an analysis based only on quantitative statistics, is not surprised that qualitative aspects of certain phenomena in our area of interest, or otherwise can not provide feedback to innovation policies of the university. Therefore, to obtain a system of indicators as complete quantitative data were supplemented with qualitative information about innovation, obtained through sample surveys held in the university R & D centers. Research should address four target groups: university faculties, specialized departments, research centers and other entities to R&D or innovation and technology transfer within the university. Therefore, surveys should be conducted in the target groups to gather information on:

a) the involvement of R & D centers in enhancing innovation in the university, development trends and directions in university R & D centers, etc. immediate needs in innovation.

- Exhaustive statistical survey among IDUs in university centers;
- Statistical survey in each RDI center
- b) leverage the results of RDI center in each university
- Exhaustive statistical survey among IDUs in university centers;
- Statistical survey in each RDI center
- c) engage each RDI center, faculty management / R & D centers and general management of the university to support technology transfer (Oneness where applicable) - statistical survey of each center the RDI management and general management level university.

To assess the innovative potential and to exploit the short and medium term results of RDI projects at universities have conducted an investigation of the leaders / officers of RDI projects.

The conceptual model for analyzing the degree of innovation of a university

Components, criteria, weighting coefficients and coefficients of importance have been established both in the literature and empirical data, from the survey target groups (faculties, departments specialized research centers and other entities of RDI and technology transfer within University). Given that innovation is a dynamic process, activities come from the "past" and takes place mainly in the future, in determining the level of innovation at universities will follow the trend of innovation within the university, at least in the short .Establishing the degree of innovation (and indirectly the viability) is achieved by interpreting the calculated average score based on innovation components and weighting coefficients obtained by the relationship:

\[ G_{\text{nov}} = \sum_{i=1}^{5} C_i c_i \]

degree of innovation expressed in terms of innovation components where:

\[ G_{\text{nov}} \] degree of innovation
\[ C_i \] score given i component i=1,5
ci: component associated weighting coefficient

\[ G_{i}^{\text{inov}} = \sum_{j=1}^{n_i} \alpha_j C_{r_{ij}} = \sum_{j=1}^{n_i} \beta_j C_{r_{ij}} \]

degree of innovation of innovation component where:

\( G_{i}^{\text{inov}} \) - degree of innovation associated to i component i=1,5

\( C_{r_{ij}} \) - score given j criterion associated with i component i=1,5

\( \alpha_j \) - important factor associated with j criterion

\[ G_{\text{inov}} = \sum_{i=1}^{5} \sum_{j=1}^{n_i} \beta_j C_{r_{ij}} \]

degree of innovation expressed according to the criteria of innovation

By applying the computer model, the factors, under-factors and indicators, and their weights, have revealed three possible degrees of innovation in the university:

If: \( 0 \leq G_{\text{inov}} \leq 83 \) then the university has a low potential for innovation

\( 84 < G_{\text{inov}} \leq 165 \) then the university has a potential innovation environment

\( 165 < G_{\text{inov}} \leq 248 \) then the university has a great potential for innovation

The model was applied to all university faculties. The assessment were considered technical and economic information in the levels of 2009 (the reference data). In the study of analysis and assessment of innovation performance in the university were taken of the main components of innovation:

1. potential driving innovation - to quantify the structural conditions necessary to ensure innovation potential;
2. potential for creating knowledge - to measure investments in human potential as a resource to research and development - a key element of the knowledge economy);
3. ability to integrate a relational system - to measure innovation efforts in the university;
4. ability to structure activities - to measure performance, expressed in terms of added value;
5. capability to exploit the intellectual property - to measure the results obtained through the exploitation of knowledge and intangible assets.

The conceptual analysis and evaluation of innovation in a university based on a system of indicators grouped into factors (components) and the criteria of innovation will be achieved by aggregating the central analysis and assessment of indicators of innovation in the R & D centers indicators developed and developed under Partnerships in priority areas - project INNOINDEX – Model and computer program for determining the degree of innovation of SMEs, adapted and supplemented with other indicators specific academic activity. The indicators used to audit innovation in university and is harmonized with other indicators to calculate the degree of innovation, recognized nationally and internationally:

- European Innovation Scoreboard (used to evaluate innovation in the EU Member States).
- Inobarometru 2008 - Innovation in the development regions of Romania.
- HG 551/2007 on accreditation/certification RDI units in Romania.
- INNOINDEX (PN II Partnership Program) - system of indicators to calculate the rate of innovation in SMEs.

Indicators of model information are presented below:

1. Potential to lead of innovation:
- Staff involved in technological research and development activities (RTD)
- Staff involved in the promotion, marketing, economic forecasting and environmental monitoring
- Supporting innovation in the faculty
- Professional prestige to the faculty
2. Knowledge creation potential:
- Their funding sources for RTD
- Public funding of RTD including European funds
- Attracted funding sources for RTD
- Ability to attract funding sources
3. Innovation and integration in a relational system:
- Innovation
- Cooperation and collaboration with other entities (universities, INCD's, ITT entities)
4. Performance of innovation activities:
- Participation in the development of new products / upgraded or new technology / market upgraded
  - RTD activities
  - Consulting activities (services)
  - Promotional activities, marketing and distribution
5. Intellectual property
- Scientific publications and participation in scientific events, fairs, exhibitions
- Economic and technical documentation
- Patents
- Models and industrial designs protected
- Others (copyright, trademarks)

References