Executive Summary

The PEUID (Strategic Planning for R&D Units) is a project aiming to provide all R&D units of IST with a planning mechanism for the medium/long term to allow them to adapt and respond to the current context and future scenarios. This project consists of 3 approach levels: first, a model for the evaluation of R&D Units made in Brazil was adapted and tested in a medium-sized R&D unit; second, a comprehensive study was prepared, which addressed the performance of the R&D units of IST focusing on survey information regarding human resources, training, research infrastructure, funding, projects, publications and patents, third, a study and collected bibliometric information / publications was carried out with analysis comparative and respective benchmarking (IST, Portugal, international) that focused on the impact of scientific output.

The PEUID has an implementation plan which varies over time: each year, a bibliometric study is carried out in IST; every 3 years, a bibliometric study of the information of R&D Units; every 5 years a study of the performance of R&D units and review of all strategic planning. The bibliometric study results in the production of an informative dashboard which includes financial information and human resources, and allows, in addition to constructing performance indicators, for comparing the IST and its units with some international institutions.

Implementation of the practice

(Describe the implementation of the practice: actions, timing, resources applied. Degree of adjustment of the practice deployment with the objectives, areas and the planned approach)

The PEUID began in 2011 through the development and adaptation of methodologies, tools and skills necessary for their attainment level. This project was coordinated by the Scientific Board of the IST with the support of AEP (Area of Studies and Planning) in its most operative aspect (2nd and 3rd level approach). On one hand, the implementation plan was based on an initial period of about 1 year (with revision/review planned after the first 5 years), and consisted in the adaptation of a model to evaluate the R&D units/large companies conducted research for the Brazilian Ministry of Science and Technology. This model was tested in a pilot project developed a medium sized R&D units, to validate the context of the IST and subsequent application to other units.

Within the scope of good practices the focus is on the project in its operative aspect, and a second level of approach framed the comprehensive study of the performance of the R&D units of IST. This study integrated in PEUID, aims to make a diagnosis and benchmark national and international results and position the R&D carried out at IST. Its implementation was based on the collection of indicators of activity/results of the R&D units of IST focusing on human resources, training, in research infrastructure, financing, the developed projects, publications and design patents. This study is marked every 5 years, preparing for the next cycle of strategic planning of R & D units (5 years). A third level of approach, a special focus was placed on the bibliometric analysis, which aims to raise the profile and impact of scientific publications of IST and evaluate policy outcomes (external and internal) in the scientific productivity of the school. Annually, bibliometric information / publications is collected, therefore contributing to the benchmark (IST, Portugal, international) with focus on the impact of scientific output. 3 in 3 years, the process is further comparing all units of IST in the areas listed above. Together with bibliometric collection of information, the financial and human resources indicators are also collected that complement the institutional and unit dashboards and allow for the construction of a set of performance indicators

Achieved results

The first results came out in early 2012 with a comprehensive study regarding the performance of the IST R&D units between 2005 and 2010, with a very special emphasis on bibliometric analysis. In the period at issue, there were some external contacts with experts in the field (national and international), which made it possible to support the final decisions of the model.

In addition to the Scientific Board, through the coordinating committee, the team involved 3 full-time members of AEP, during the months of greater workload. Given the fact it was a very innovative initiative, which uses an external database (ISI Web of Knowledge), and whose processing was fully ensured by the team (by extracting the BD from the website), the production of the first report was extensive and forced to standardize information for several scientific publications

As already mentioned, in 2013 the process underwent some adjustments due to the availability of information through another source with sufficient resources to save time and quality. However, it should be noted that the main findings obtained from the performance study in 2012 and discussed in the Scientific Board was that the R&D units must strategically reflect on their placement (e.g. using the tools made available by the SB) to set (at global level and for its researchers) goals and improve its key indicators focusing on the impact of component research, competitive funding (at FCT) and human resources (PhD students + staff / administrative technical support). These results made available to R&D units (Individual dashboard) allow for making them more competitive and allows for defining if there is this need , an adjustment in the number of existing R&D units, closing , merging or creating new ones.

This experiment identified that the membership processes were not having the desired quality. To solve this problem, a strategy to communicate with Thomson Reuters (the owner of the ISI Web of Knowledge) was designed, and this partnership has resulted in an improved number of correct tags who just as a curiosity, in the case of STIs were detected 22 (12 detected by Thomson Reuters and 10 detected by the IST team), and in the case of different R&D unit that number ranged from 3-10 tags.

The main performance indicators involved in this study made it possible to detect an increase in the number of publications and papers produced in recent years, although with different dynamics in each compared year, for example, the number of publications in internationally or nationally ranked 10th or 20th. For example, the doctoral fellows/teachers ratios also allowed for identifying different realities in each R&D unit, as well as units with the largest installed capacity in terms of attracting competitive funding.

Assessment and review

The adjustment level had some practice with the objectives and guidelines redefined nuances given its complex nature. For example, it is noted that in 2013, the treatment of the information was based on data from FCT (Foundation for Science and Technology), which provided the bibliometric data of most R&D units nationwide and allowed for working on data differently but with the same objective. However, the work plan remains unchanged, with the purposes of the project and practice to remain in accordance with the objectives defined.

To complement the analysis of scientific output promoted by PEIUD, and to improve some indicators, an extensive study of the journals was developed both in DB ISI Thomson Reuters and in the BD Scimago (both Journal Rankings), and it was possible to define a set of tier 1 and tier 2 journals, in each of the areas and scientific domains could help researchers, the units of R&D and IST to position themselves more effectively and improve their productivity.

Focusing this analysis on the 2nd and 3rd level approach, some improvement measures and evaluation process were taken. For example, the level of scientific productivity, it was recommended that the units should focus on articles publications and participation in conferences , ensuring that publish in scientific journals with highest coefficients in the respective areas of influence and harmonize the names of schools and centers ("tags") and increase international collaboration. The level of funding was recommended to increase the external funding to the FCT (Foundation for Science and Technology). As a third and final example, in methodological terms, which were defined indicators to be collected in future studies based on the first experience, the placement of relevant information units in a centralized R&D system and a workshop to share good practices between the R& units were recommended.

The process was always followed up by the Scientific Board, involving all its members, and sought to improve and refine the model before each step of the study and its variants. Other fundamental aspect that consolidated this practice as of excellence was the accreditation of the Integrated Quality Management IST (SIQuIST) by the National Assessment and Accreditation of Higher Education (A3ES), which introduced this project as a good practice, which is capable of spreading by higher education institutions national.

Innovative character and transferability

(Describe the aspects of internal innovation (at the institution) and innovation as respect to the context (at the university system) of the practice. As well as the elements and aspects that can be applied to a different context and possible recommendations that should be taken into account in a benchmarking opportunity)

Internally, this was a highly innovative practice, given the fact that lack of awareness of the R&D units, mostly about their relative positioning on all indicators worked out, did not favor their strategic planning. The creation of an individual dashboard per unit was an action in line with plan and resulted in a gain for the institution and its units, also allowing for the analysis about which way to become more competitive units, merging them in some cases, to capitalize on the critical mass installed and raising competitive funding

The whole process is extremely valuable and can be included in another external reality, because it is the production of an information system with precise indicators that support strategic decision making, as recognized by A3ES. However, the following recommendations for its implementation should be taken into account (in particular, for the 2nd and 3rd level approach):

1) Try to start from a system of affiliation designations as much consistent, harmonious, similar as possible (the use of ID Research is recommended) ;
2) Build convergence bridges with R&D units for the missing information to be easily detected and corrected;
3) Build a simple layout whose indicators are easily noticeable (recommend some graphics for the visualization and interpretation is almost ready);
4) Define a strategy for the collection of all non-bibliometric indicators are not dependent on annual responses of each unit individually (it can become very time consuming process, if there are many units to be assessed); should become mandatory a system of placing this information that is centrally managed;

5) Ensure an effective communication tool that should always be endorsed by the body that oversees the institution scientific credibility to the system itself
6) Ensure the mediation between each unit management and implementation of strategic measures.