Indicators to measure progress and performance in entrepreneurial change processes in higher education institutions

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1. Introduction: progress indicators and the PDCA cycle

This note proposes progress indicators and possible applications that intend to support institutional practitioners engaging in entrepreneurial change processes in their higher education institutions (HEIs). The indicators allow the project leaders of institutional change projects to reflect on the progress and performance in their entrepreneurial change processes.

Entrepreneurial change processes are often undertaken by HEIs as part of a project. This note therefore, is based on the idea that indicators to measure progress and achievements are to be seen in the light of a project plan that is managed by a project leader. The note is also based on the assumption that the entrepreneurial change project is making use of the HEInnovate tool.

HEInnovate is a set of resources, including a self-assessment and a rich database of materials such as case studies of HEIs and guidance notes for running HEInnovate workshops. The tool was used by the HEIs that collaborated in the BeyondScale Forward Looking Cooperation project, funded under the European Commission's Erasmus+ program. Each of the project partners in BeyondScale used the tool for their entrepreneurial change projects – their inbound and outbound projects. In the course of their projects they made some additions to the tool, which are described in the other materials and notes hat can be found on the BeyondScale website.

Based on the experiences collected in the BeyondScale project, this note includes some hands-on practical advice on how such change processes can be monitored in the different phases in a *project life cycle*. This note is meant to support project managers looking for indicators to monitor and keep track of their organisational change processes aimed at encouraging entrepreneurship and innovation.

Projects are dynamic processes and can be divided into four general phases. This makes it possible to manage a project and to track progress towards the project's goals. The four phases are based on Deming's well-known PDCA cycle, that is: the Plan-Do-Check-Act cycle. PDCA is a management method used in business for the control and the continuous improvement of processes and products (see Table 1 and Figure 1).

Table 1: The project phases in the PDCA cycle

Phase	Description
Plan	Establish objectives and processes required to deliver the desired results
Do	Carry out the actions defined in the previous step. Test potential ways to address a problem/ challenge.
Check	Study the data and results gathered from the 'do' phase and compare these to the expected outcomes

Phase	Description
Act	Implement the findings from the 'do' and 'check' phases and identify problematic issues, inefficiencies and opportunities for improvement, The causes of such issues are investigated, found and eliminated by modifying the process

This note in particular looks at the third phase – the CHECK phase – as shown in orange in the graph below. It shows the P-D-C-A Cycle for the case of the BeyondScale projects, where each of the project partners worked on an inbound and an outbound project. The projects initiated by the BeyondScale project partners either focused on changing internal structures (these were labelled: inbound projects) or on strengthening the arrangements and interaction structures for cooperation with external stakeholders (i.e. the outbound projects). In the projects, the project partners involved some of the other project partners as buddies, to interact with while doing their project.

Figure 1: The Deming PDCA cycle
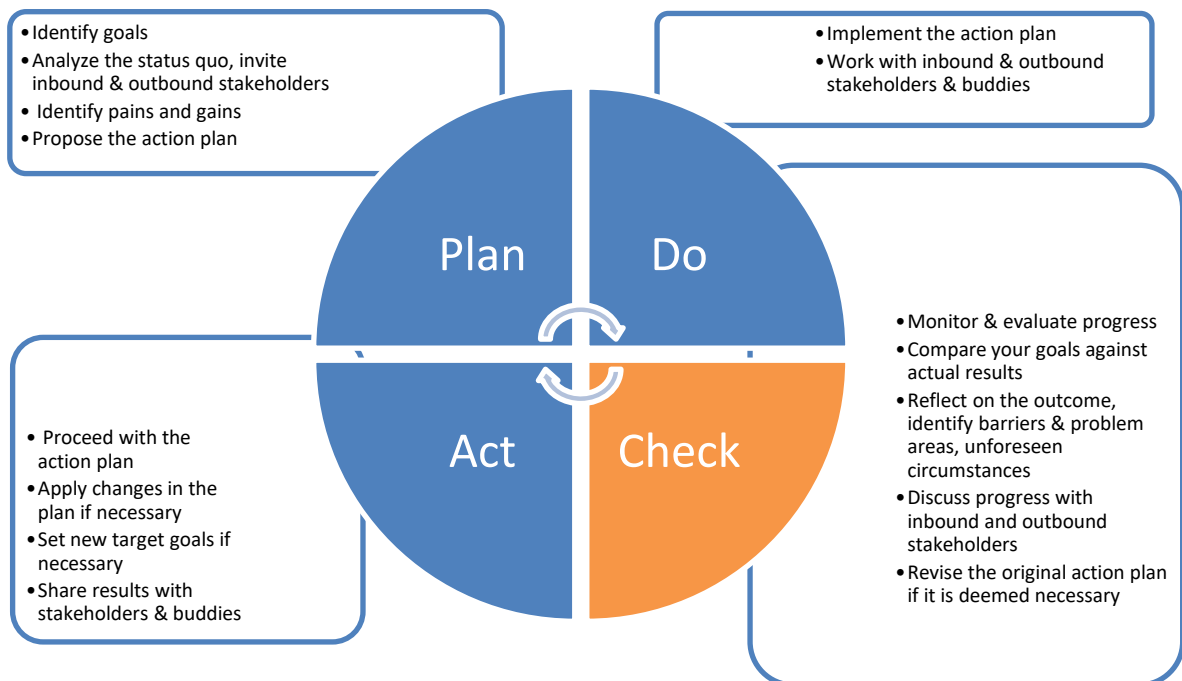
In the check phase, project managers do more than compile a set of indicators (see Figure 1). However, in this note we focus on the measurement of progress in a project and whether a project has made any impact in terms of contributing to the entrepreneurial character of the HEI.

2. Progress Indicators

How do we know a project is on track to deliver on its objectives? And whether progress is being made? How can we know if an action – a policy, an *intervention* – is working? Indicators are one approach to measure progress. With some carefully selected indicators, (see text box on the right) it is possible to get a good overview of the progress and performance resulting from undertaken the activities in the project.

Generally, an indicator focuses on a small, manageable set of information that gives a sense of the bigger picture. The choice of indicators is important as

What are indicators?
Indicators:

- Measure progress in realising performance (or, at least: change) against a target to evaluate the effect of policy actions and plans.
- Provide information to the project team (i.e. the responsible organisation), the HEI, policymakers, and internal or external stakeholders.
- Describe, show trends, communicate the results of implementing actions in a simplified way.
- Indicators can help identify barriers and facilitators in project implementation.

to whether it gives a sufficient 'sense of the bigger picture. There is no need to measure everything. It is better to start with a small set of feasible indicators to monitor and improve or adapt the set over time to meet the project goals. With the help of indicators, project progress can be assessed across the project lifecycle

If project managers wish to assess the project's progress and the impact of the activities undertaken as part of it, it is useful to structure the project into four major phases, that is: Inputs, Activities, Outputs and Outcomes. Figure 2 below provides an overview of this project lifecycle.

For each of the four stages in the project, a set of indicators can be established (Albats et al. 2018). The second line in Figure 2 shows examples of indicators for activities/projects linked to the HEInnovate dimension 'Entrepreneurial Teaching and Learning'. The bottom row in the figure shows the elements on which the indicators – and the assessment of the project's impact – is focusing.

Figure 2: Progress indicators, project lifecycle and assessment activities
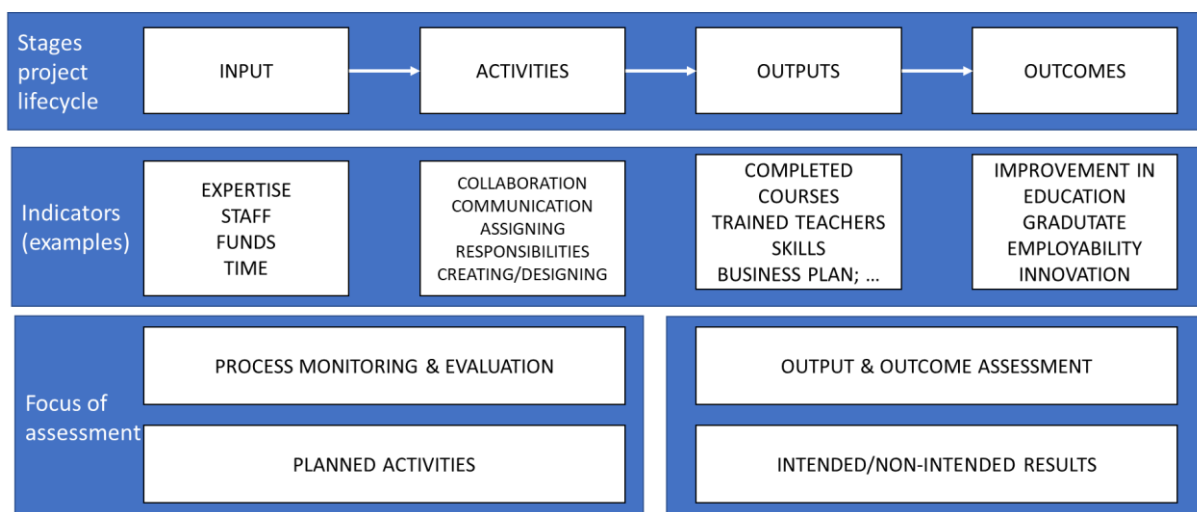
In the following, we will describe the indicators and how to use them in the reflection and provide a few example indicators.

3. Indicators for the project lifecycle

Inputs and input indicators

The first areas on which the assessment and measurement is focusing are inputs and activities. Inputs refer to the resources dedicated to the project. These mainly include time and money. Project managers should consider the resources the HEI (or the unit involved in the project) invests in the activity and the resources provided by other stakeholders. Besides time and money, one could also think of immaterial inputs such as knowledge, expertise and support, or hardware such as buildings, IT-Infrastructure and legislation.

Input indicators address the extent to which these inputs have been used so far in the project. These indicators also allow checking how much time and other resources are still available for the project.

Input indicators are, among others:

- Time until project completion
- Time spent on the specific activities that are part of the project;
- Number of dedicated staff involved in the project; and whether that number has changed during the project's duration;
- Financial resources dedicated to the project and whether the project budget has changed (depleted; augmented) during the project's duration; resources spent (by the respective partners) on activities so far.

Activities and activity indicators

The activities carried out during the entrepreneurial change project depend on the actual goals of the project. Most projects that try pushing the entrepreneurial agenda of a HEI have in common that they require partners (internal; external to the HEI) to *collaborate* in the activities. The partners have to work together to deliver on the project's objectives. For instance: creating entrepreneurial modules, training teachers, or helping students set up a business plan. To ensure such a collaboration, partners will have to meet, negotiate, agree on who does what, invest time and financial resources, exchange information and test their intermediate outputs.

Progress indicators could therefore measure:

- The number of meetings organised
- The number of participants in those meetings
- Whether the project has managed to extend its outreach (number of participants in the network/collaboration)
- The degree to which the general information, progress, and project issues were communicated among the partners in an effective and timely manner

- The degree to which those meetings and discussions between partners have contributed to achieving the project's intended results
- The degree to which the roles and responsibilities for each partner in the project were divided and communicated
- Whether external project partners have provided technical assistance or expertise
- Whether the initial time planning for delivering on the outputs of the project is realistic
- Whether the scope and objectives of the project were realistic
- Whether the deliverables (intermediate outcomes) that were specified as part of the project plan have been produced
- Communication to ensure the collaboration success the communication channels should be defined and established, communication groups should be formed

For many of the progress indicators mentioned above, objective quantitative indicators do not exist. For these, information can be collected among the project participants - asking them for their perceptions, opinions and qualitative assessments of the issues under review. For that, a five-point Likert scale can be used, as shown in the example below:

	not at all	to a little extent/ degree	to a moderate extent/ degree	To a great extent/ degree	To a very great extent/ degree
	1	2	3	4	5
the general information, progress, and project issues were communicated among the partners in an effective and timely manner	□	□	□	□	□

Assessing inputs and activities – Process monitoring and evaluation

The monitoring and assessment of inputs and activities thus essentially looks at the things that have already been contributed and undertaken. It is important to determine how much effort was put into the activities, i.e., relating the inputs to the activities. Here it can be questioned, for example, whether the planned activities can also be implemented with the planned resources. For example, can it be determined that a selected activity requires significantly more or fewer resources than planned? Then it makes sense to find out the reason for this and, if possible, redesign the activity.

Process monitoring can also be used to review the project timetable: Were the envisaged milestones achieved within the planned time? Which subtasks are delayed? What is causing these delays? Does the delay possibly endanger that the project goal cannot be achieved on time? What measures can be taken to make up for the delay?

The assessment of inputs and activities should address the following points, if possible:

- Determine whether sufficient resources are generally available to complete the project objectives.
- Determine whether the resources currently available are sufficient to achieve the project's objectives.
- Determine how much input has already been used for the activities and whether the consumption aligns with the planning.
- Determine whether the sub-activities of the project are still on schedule or whether any delays have occurred.
- Determine whether these delays have an impact on the achievement of the project objective.
- If these assessments show a difference between the initial planning and the project's current state, it may be necessary to identify the causes of the deviation and adjust the project plan accordingly. Accordingly, if possible, answers to the following questions should be formulated when such deviations occur:
- Why is there this deviation between the plan and the current processing status? What factors (individual, institutional, legislative, in the university's environment) have contributed to this?
- What activities can help to resolve the situation? Does it make sense to allocate additional funds to the project? Does the project goal perhaps need to be more realistic, i.e. adapted to the circumstances?

Outputs and output indicators

Outputs are the products and services which result from the project/intervention. They may also include other unplanned changes that result from the intervention and are relevant to achieving the outcomes. Depending on the project goals, the intended outputs will differ in their definition, nature and degree of exactness. The question is whether the intended outputs can be clearly defined and specified as measurable quantitative outputs.

Most projects in the area of pushing the entrepreneurial agenda have in common that they intend to create entrepreneurial education modules, train teachers, help students set up a business plan[1]. Projects that touch on the HEInnovate dimension 'Knowledge Exchange and Collaboration' often intend to enlarge and intensity the institution's number of contacts with external partners. Contracts or joint projects or joint activities may result from these contacts.

To measure outputs, quantitative as well as qualitative indicators can be used. Quantitative indicators could include the number of courses or modules developed in the project, how many students have signed up for them, or completed such modules). However, assessing or evaluating

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[1] See, for instance, the Inspiration Fiche on ' Entrepreneurial Teaching & Learning' that is available on www.digi-buddy.eu

the learning outcomes of students and staff is a more difficult undertaking. In these cases, one may have to resort to qualitative indicators or consider EPIC[2] or Entretime[3] .

So, some examples of progress indicators for assessing the outputs are:

- The number of new (or improved) education modules that focus on entrepreneurship & entrepreneurial skills
- How many students have signed up for these modules or completed such modules
- Training events organized by the HEI to introduce their lecturers in pedagogies that support entrepreneurship in education
- The number of spin-offs and start-up companies s created by students/staff
- Support services or technologies developed by the HEI
- The number of contracts signed between the HEI (or some of its departments) and companies or not-for-profit organisations
- Turnover in contracts and joint projects undertaken with external partners
- The number of spin-offs and start-up companies s created by students and staff
- Support services or technologies developed by the HEI
- Advice provided by the HEI to external partners

Outcomes and outcome indicators

Outcomes are the likely or achieved short-term and medium-term effects of the project's outputs. While outputs are often more tangible and direct, the project's outcomes are usually less tangible, with 'softer' effects unfolding some time after the outputs had been produced.

Outcomes relate to the wider goals or effects of the projects. For example, projects aiming at strengthening entrepreneurial teaching and learning in the institution could produce as an output an increase in the number of courses that include an entrepreneurial component or an increase in the number of teachers participating in entrepreneurship training. As project outcomes, one could think of more students venturing into their businesses upon graduation or a shorter time to a first adequate job. Outcomes thus reflect longer-term effects for stakeholders or targets groups of the actions and whether the outputs improve the target group's economic well-being, level of information, education, living standards, awareness, or capacities. As target groups, one could also think of the region in which the higher education institution is embedded.

Outcomes, however, are not per se positive or unfold as planned. Rather, there can be positive and negative, primary and secondary long-term effects resulting from a project. Some are felt directly, others indirectly, some outcomes are intended, while others are unintended.

To measure outcomes, quantitative as well as qualitative indicators can be used. Examples of outcome indicators are:

- Satisfaction with the impact of the project's activities & outputs on the institution

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[2] EPIC = The Entrepreneurial Potential and Innovation Competences. See:
https://heinnovate.eu/sites/default/files/EPIC_user_guide.pdf

[3] See: https://heinnovate.eu/en/related-projects/entretime

- Satisfaction with the impact of the project's activities & outputs on the target groups and relevant stakeholders
- Increase in the number of start-up companies in the close/regional environment of the HEI
- Increase in the number of students finding adequate employment shortly upon graduation.

For assessing or evaluating outcomes, one may have to resort to qualitative indicators that capture the opinions or perceptions of people by means of their scores on a five-point Likert scale. This comes close to the kind of self-assessment statements used in tools such as HEInnovate.

For example, in entrepreneurial teaching and learning projects, one can ask whether strengthening the students' entrepreneurial skills has improved their chances in the labour market. To assess this, the situation at the beginning of the project is usually compared with the current state.

Impact assessment

When monitoring the achievements of a project, there should also be room for more reflective, evaluation-type questions that try to determine the extent to which a project has been successful – whether it has had an impact. The evaluative questions touching on impact assessment can usually not be translated into indicators or measurements. The evaluation questions are more of a qualitative nature. They are the subject of another note made available on the BeyondScale website.

The BeyondScale project plan foresaw that the eight project partners conducted a self-assessment exercise as part of their inbound/outbound activities, where they would twice make use of the HEInnovate Self-Assessment statements. The first application of the self-assessment was done to kick-off their entrepreneurial change project, and stakeholders were invited to score the HEI on a five point scale for each of the self-assessment statements.

During the second self-assessment exercise, the representatives of a HEI could again be asked to score their HEI using the same statements. The difference between the two scores would then indicate the extent to which the HEI's performance has changed. Obviously, the question is whether this change is due to the project undertaken, or whether it is caused by other drivers. In case of the first, this would be a way to determine the extent to which the 'entrepreneurial agenda' has become further embedded in the HEI.

References

Albats, E., Fiegenbaum, I., & Cunningham, J. A. (2018). A micro level study of university industry collaborative lifecycle key performance indicators. *The Journal of Technology Transfer*, *43*(2), 389-431.