OPEN INNOVATION CURRICULA: KEY INDICATORS AND SUCCESS FACTORS

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Abstract

This article addresses the indicators and success factors characterising Open Innovation (OI), in order to provide a methodology for the analysis of a program on OI in Higher Education curricula. The focus is on indicators that facilitate the open innovation process in organizations and are expected to be useful for the design, development, analysis and implementation of a Higher Education curriculum focusing on open innovation.

Indicators are 'signs', 'processes' or 'actions' that are visible and may be measured. They enable the recognition of OI practices and provide visible evidence of the practices that may be critically assessed. The aim is to provide insights into and an increased understanding of the key indicators which Higher Education curricula need to take into consideration when designing, monitoring, implementing and evaluating OI programs and which are appropriate for the needs of organizations. The approach is needs-driven, taking all the stakeholders involved in the development process into account.

INTRODUCTION

This is a conceptual piece of research based on relevant literature. It addresses the indicators and success factors characterising Open Innovation (OI) in order to provide a methodology for the analysis of a program on OI in higher education curricula. Although it is not specifically directed towards a particular academic degree, it provides an initial framework which has the potential to be developed in line with the level of various degrees, i.e., Diploma, Bachelor's, Master's, MBA or PhD (see Figure 1: List of key indicators and relevance for HE Programs at different levels for a suggested distribution of the key indicators related to various program levels).

Table 1. List of key indicators and relevance for HE Programs at different levels

Indicators	Diploma	Bachelor's	Master's	PhD
A needs-driven program	√	√	√	√
Cost evaluation	√	√	√	√
Quality	√	√	√	√
Leadership	√	√	√	√
Knowledge creation and knowledge transfer		√	√	√
Organizational culture		√	√	√
Organizational climate (including communication)	√	√	√	√
Resources	√	√	√	√
Eternal collaboration	√	√	√	√
Human Resources training and development	√	√	√	√
Relational issues			√	√
People involved in the open innovation process – including Director of Innovation, idea scouts, idea champions, idea connectors			√	√
Strategy: Strategic Alliances and Alignment of a strategic OI agenda	√	√	√	√
Incentives – intrinsic and extrinsic motivation and rewards	√	√	√	√
Regular monitoring and regular review			√	√
Post program effects (alumni tracking, etc.)				√
Sustainability			√	√

The main focus is on indicators that facilitate the open innovation process in organizations, which are expected to be useful for the design, development, analysis and implementation of a higher education curriculum focusing on open innovation.

The ideas presented here may also be used in organizational training programs. The main aim is to provide insights into and increased understanding of the key indicators which higher education curricula on Open Innovation need to take into consideration when designing and analysing programs, and which are appropriate for the needs of organizations. The approach is needs-driven, taking all the stakeholders involved in the development process into account.

What are Indicators?

Indicators are 'signs', 'processes' or 'actions' that are visible and that may be measured, e.g., patents registered as a result of collaboration with other individuals or organizations outside the region or territory. The indicators may be assessed by using either qualitative or quantitative research methods. They should enable the recognition of OI practices and provide visible evidence of these practices that may be assessed critically. The OI indicators should be determined and set in place prior to implementing a curriculum in Higher Education or before the innovation process commences in an organization. They should emerge after meaningful discussion with stakeholders and be accepted by all stakeholders involved in the process. The indicators may also act as milestones to assist progression from one stage of development to the next, both with regard to curricula and to the implementation of OI in organizations.

Gajda and Jewiss (2004) distinguish between process indicators and outcome indicators. The former are concerned with the delivery of program activities, while the latter refer to outcomes achieved by a program. In their view, 'Process indicators help track the progress that your program is making as you work toward achieving the desired outcomes. Process indicators often provide important feedback to program providers long before you can expect to see evidence that outcomes are being achieved. Outcome indicators provide the most compelling evidence that the program is making a difference in the lives of program participants' (op.cit., 2004, p.2).

Indicators for innovation (and particularly for OI) are not a recent phenomenon. Already Schumpeter (1943) had listed clear vision, strong leadership, and close collaboration as components for cooperative entrepreneurship leading towards innovation. He anticipated the fact that collaboration would move beyond company borders. Chesborough (2003) has later promoted the topic of open innovation with emphasis on external collaboration.

Key success factors for Open Innovation

In order to elicit the key indicators for Open Innovation it is first necessary to review briefly some key concepts on which the rest of the article is based. Open innovation involves the transfer

of ideas and knowledge beyond traditional limits. It may operate in two ways, either inside-out (through transfer of expertise or sale of patents) or outside-in (through purchase of patents or use of external expertise). It often involves collaboration amongst individuals and communities that may be located at opposite sides of the world, possibly including the management and leadership of virtual teams. Leadership plays an important role in the process, and it is one of the key factors for successful collaboration and for creating, establishing and sustaining strategic alliances.

Knowledge creation and knowledge transfer, which may be more efficient through engagement with external sources, are crucial for successful open innovation. Knowledge may be acquired as a result of:

• Purchasing (through, for example, knowledge brokers or IP auctions)
• Sales of IP
• Sub-contracting (often allocated to established universities or research institutes)
• Collaboration with external partners (networking, clustering, joint ventures, crowd sourcing)
• Licencing
• Creation of spin-offs
• Venture capital

Some obstacles that inhibit knowledge creation and knowledge transfer include:

• Reluctance to share knowledge (for example, for fear of the competition taking over ideas ripe for innovation),
• The risk of 'free-riders'
• Strategic problems related to the identification and efficient absorption of relevant knowledge (e.g., not in line with the organizational vision, policy or strategy)
Some caution should be exercised in this regard:
• It is relatively easy to purchase information but this needs to be properly combined with experience, skills etc., in order to generate knowledge.
• Purchasing a license is nothing more than obtaining access to information, which is still far from knowledge.
• Mere chaotic (as opposed to strategic) transfer of information could be an impediment to a smooth innovation process.

Attention should be paid to two enablers of successful OI and successful innovation management – organizational culture (e.g., aspects such as behaviour, rituals, how we do things around here) and organizational climate (e.g., communication practices and other environmental factors that enable collaboration and the exchange of ideas).

Successful OI requires an appropriate and feasible strategy and the cultivation of a climate and culture that enable knowledge transfer and the sharing (and flow) of ideas. In this regard, 'com-

munication and other interfaces must become as permeable as possible in order for ideas to flow easily and to be directed towards those who have the authority to take action and for knowledge transfer to be effective' (Goodman and Dingli, 2013, p.197).

Lindegaard (2010) provides a list of elements that need to be put into place before an OI initiative is launched. These include:

• a clear mandate,
• a strategic purpose,
• an ideation theme,
• stakeholder analysis,
• a communication strategy,
• a shared language about innovation within the organization,
• organizational approaches that allow the involvement and commitment of all relevant internal and external actors,
• an attitude that strives for being innovative rather than becoming innovative.

In a paper that provides a systematic review of 29 referred empirical articles on the open innovation process, Durst and Ståhle (2013) describe 'a simple model' of the open innovation process as comprising 'the search for innovation opportunities, the selection of suitable opportunities that organizations want to pursue, the implementation of the projects chosen and the capture of benefits as a consequence of the innovative activities' (op.cit., p.113).

Durst and Ståhle (2013) give four reasons why external collaboration is difficult to establish and control:

• Establishment of common and fruitful ambitions and aligned incentives.
• Trust (related to information sharing), particularly between remote partners from business and NGOs.
• Resources – including financial, knowledge or learning capabilities.
• Behaviour (between partners, possibly including coordination, discipline, communication, and relationship management).

There are various ways in which resistance could be avoided or overcome, but this goes beyond the scope of this article. In brief, however, Goodman and Dingli (2013) suggest that the following aspects should be considered and implemented strategically to avoid resistance:

• Appointment of a Director of Innovation
• Identification and appointment of idea champions
• Establishment of open communication channels
• Effective dissemination of information [to the right people, internally and externally]
• Appointment of idea connectors and idea scouts

• Staff training and development
• Creation of effective strategic alliances and university/enterprise collaboration.

INDICATORS FOR OI IN ORGANIZATIONS

After extensive research and exploration of the relevant literature, the following key criteria have been identified and are considered to incorporate the relevant issues related to indicators for open innovation in organizations (adapted from Durst and Ståhle, 2013, pp.123-125).

• Relational aspects - collaboration, shared objectives and effective management of relationships.
• People involved in the process - motivation, willingness to develop new skills, commitment, and diversity (age, gender, education).
• Governance - clear distribution of tasks, a dedicated project team, establishment of mechanisms, structures, objectives and agreements, performance evaluation, and intellectual property issues
• Facilitators - idea champions, idea connectors, idea scouts, innovation brokers, relationship managers, and research centres.
• Resources - human resources, time, equipment, and budget.
• Strategy - awareness of feasibility issues, alignment of open innovation with the overall strategy, environmental scanning, availability of Plan B.
• Leadership - leading the change process, modelling desirable behaviour, and experience in change management.
• Climate - trust and open communication.
• Culture - monitoring elements of organizational culture (mission statement, myths, legends, rituals, how 'we' do things around here) and transforming the organizational culture into an open one.

In line with the above indicators, Buerkler (2013, p. 2) provides a list of four key conditions which are necessary for the success of an innovation platform which could also be considered to apply to OI. These key conditions are:

• sufficient common interest in the planned innovations
• trust among the partners involved
• appropriate resources (human and financial)
• behaviour and conduct directed towards achieving outstanding results, i.e., innovation.

INCENTIVES AND OPEN INNOVATION

Incentives play a role in the open innovation process as they may potentially increase motivation related to the generation and sharing of knowledge and ideas. The incentives may involve either intrinsic (e.g., recognition or acknowledgement of contribution) or extrinsic (e.g., financial) rewards.

Incentives may be awarded to either individuals or teams. Buerkler (2013, p. 19) states:

"Incentives in an innovation platform are important and should be streamlined and rationalized, not only for individuals, but also for groups and individual organizations. Incentives guide individuals and institutions when they split or structure their work portfolios. Therefore, expected appreciation, bonuses, and profits from innovation activities are crucial to generate necessary enthusiasm and energy. In order to motivate all partners, incentives must also be fair and based on delivered inputs".

Research has been conducted on incentive systems for open innovation practices. Schneckenberg (2014) conducted research on incentive systems for open innovation through semi-structured interviews with 10 experts in Germany and the Netherlands. He observes that 'The key strategic function of incentive systems is to open mind-sets of the workforce and to overcome the mental barriers of the 'not invented here' syndrome' (op. cit.,p.70). He concludes that 'none of the experts has been able to present a comprehensive and strategically aligned framework of specific and measurable objectives for the development and implementation of corporate incentive systems for open innovation practices' (op. cit., p.70), and therefore he recommends 'executive decision makers to integrate open innovation into corporate strategies. Strategic alignment is essential for identifying, incentivising and measuring progress in process implementation and long-term achievement of open innovation goals. Alignment is also the basis for developing sustainable incentive systems which foster open innovation practices' (op. cit., p.70).

Although the discussion in the preceding paragraph applies mainly to organizations that introduce and implement open innovation strategies, it is applicable to HE Institutions that introduce the topic into their curricula. Leadership is essential, as it has the potential to provide behaviour that others could emulate, particularly related to 'open mind sets'. Incentives (intrinsic or extrinsic) could, moreover, be provided for staff (academic or administrative) who are involved in the introduction of this topic, which is extremely relevant in today's fast-changing world.

METHODOLOGY FOR THE ANALYSIS OF OI CURRICULA

In order to analyse OI curricula, HE institutions should ensure, in a similar manner to organizations, that the following criteria are established:

• top management and faculty support
• a clear business plan with a precise vision
• effective communication, both internal and external to the department or faculty
• a system for monitoring the program
• an evaluation system of performance
• regular review for the purpose of updating the program

The following recommendations provided by Goodman and Dingli (2013, pp. 171-172) should be considered as key factors in the design of a program on OI:

• Information and communication should flow, vertically and horizontally.

• A specific person or department should be allocated to deal with innovation [or OI].

• Networks or links to outside sources should be created to explore collaboration or outsouring.

• The importance of external sources for idea generation and collaboration should be fostered, with focus on sustaining customer satisfaction, customer retention [and creating new markets / customers / or sources for new external collaboration].

• Awareness that R & I is relevant in all sections of the organization should be fostered.

• All employees regardless of grade should be involved in the innovation process / innovation management [and awareness of scanning environment for new ideas / new sources].

• 'Agility' for collaboration and new product development [also service / business model development / innovation] should be fostered.

• There should be fluidity within the organization to avoid creation of 'silos'.

Taking into consideration the factors listed in the preceding paragraphs, the following action should be taken:

• Develop connections and networks to foster the importance of creating and developing strategic alliances at all levels

  • sectorial and geographical

• Awareness raising

  • communication flows (in and out, vertical and horizontal)

• Integrate stakeholders into programs

  • to generate motivation and enhance recognition

• Develop methodologies, skills and expertise

  • relevant to the implementation of the program

• Seed opportunities and innovation to create strategic directions:

  • involve policy makers, prescriptors

  • create and/or develop public/private cooperation

  • establish/reinforce the links between universities and organizations.

METHODOLOGY

The proposed methodology to analyse curricula raises the following issues and questions, each of which comprises an indicator to assess the process and outcomes of a program critically:

A needs-driven program:

  • Identified level of students (degree?)

  • Should students and / or trainees be addressed (continuous education)?

Cost evaluation

- Is there a return on investment?
- Has (co-) funding been identified?
- Should it be expected to be profitable?

Human resources

- Support of all levels of management?
- Qualified personnel?
- Needs for new competencies?

Strategic alliances

- Will the needs be fulfilled / met?
- What are the roles and actions of the companies involved?
- What sort of network links should be established (commitment and geographical scope)?
- Is the identification and use of external resources required?
- Should strategic alliances be created with other HEI? / with other industry departments? With consultants, lawyers, banks? With NGOs? With others?

Communication

- Where should visibility be registered? (Internet, specialized magazines, etc.)
- How can the target market be addressed and accessed?
- Participation at relevant conferences

Quality

- Satisfaction of students/trainees
- Employment rates and career paths
- Course participation, retention and success rates
- Will client organizations sponsor potential students?
- Will the organizations sustain their sponsorship?
- Patents resulting from training

Sustainability

- Profitability?
- Percentage increase of trainees / students?
- Number of spin-off companies created
- Creation of on-site jobs?
- New applications foreseen?

Conclusion

This article has provided a discussion on concepts that are relevant to the implementation of OI at University level, some of which could be adapted for in-house training in organizations.

Key issues related to OI have been discussed, drawing attention to a number of focus areas to be included in a curriculum that covers OI, a topic that deserves increased attention, particularly at the University level. The ideas and topics included in this paper provide a starting point for the analysis of an OI curriculum which could be adopted easily by HE Institutions, and possibly by organizations that wish to increase the awareness of their key personnel.

In conclusion, it has to be admitted that change has become more visible and that the OI landscape is in the process of development and adaptation. Therefore, due to the constant presence of change, particularly in the OI landscape, it is strongly recommended that any implemented program should be revised and updated at least every two years in order to keep up to date with the shifting landscape.

KEY TAKE-AWAYS

• Providing an increased understanding of the key indicators which Higher Education curricula need to take into consideration when designing, monitoring, implementing and evaluating OI programs.

• Insights elicited from the literature on indicators and success factors for OI in organizations, and subsequently applied to Higher Education.

• A needs-based approach adopted, taking account of the various stakeholders involved.

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