

Universities and transition to sustainable development: lessons from the Costa Rican case

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Universities and SD in the industry (1)

- Universities can play a relevant role to determine the rhythm and direction of the technological change in the industry.
- This is especially true in countries where most of the firms are small or medium size.
- Universities can contribute to the design and transfer of technologies with better environmental performance in sectors where firms have difficulties to develop this kind of technologies.

Universities and SD in the industry (2)

- Universities and public labs are not only the source of personnel trained in science and technology fields.
- In a number of industries they are also a source of scientific and technological knowledge relevant to the innovative activities of firms, and research and problem solving capabilities that can be directed to problems relevant to firms.
- These knowledge and capabilities provide a broad support to the innovative activities of business enterprises.
- In turn, firms, while trying to identify solutions for technical problems and bottlenecks in the context of their innovative activities, provide universities with demands that may lead to new research questions, scientific findings, dissertations, papers and others.

Lessons from Costa Rica

- Most of the effort of R&D in the Costa Rica is done by universities.
- Firms also have R+D but few of them have a formal department.
- However, the links with industry are still weak and hindered by several obstacles.

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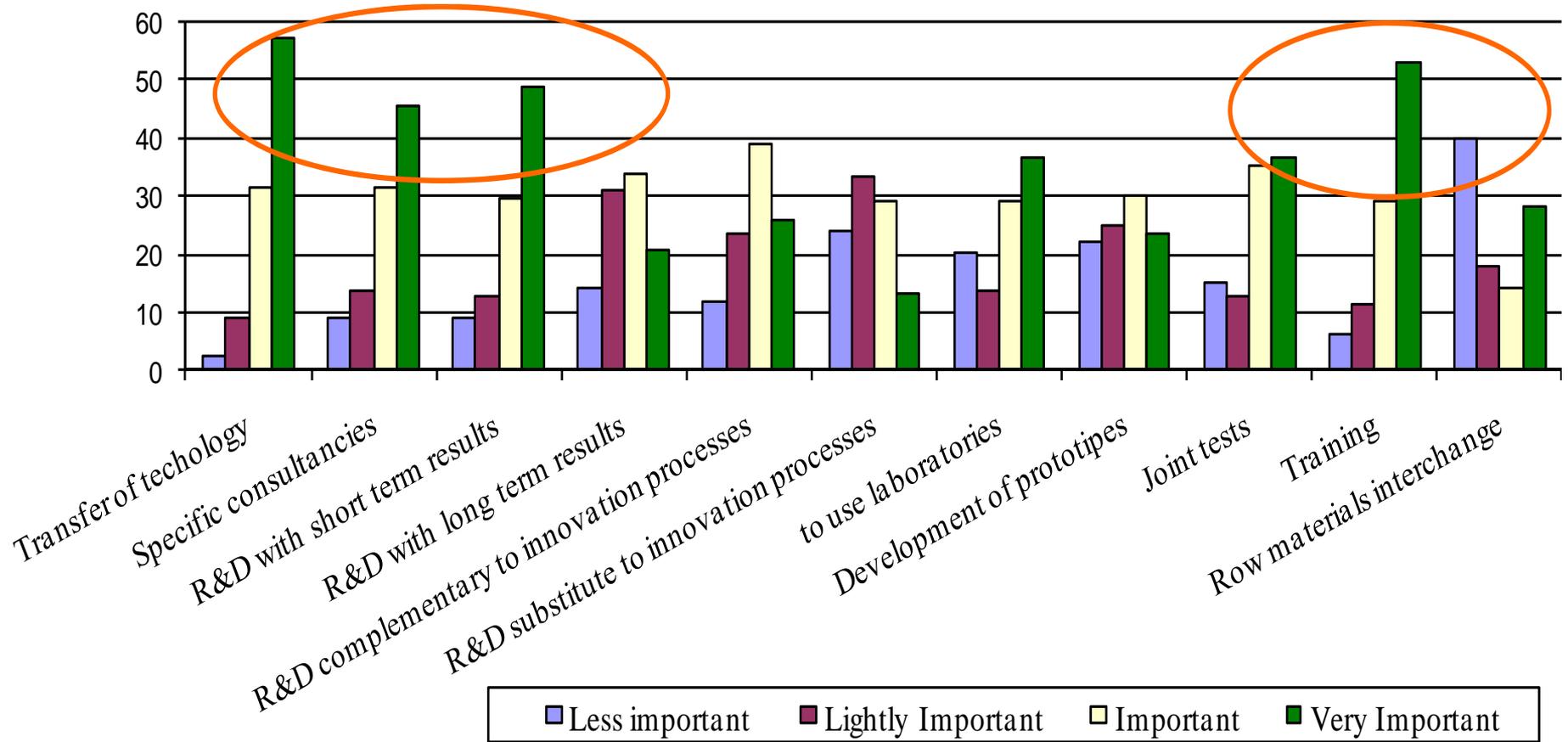
Table 2
Costa Rica: Investment in R&D, by sector
2006 – 2007

Sector	Investment in millions of dollars		Percentages	
	2006	2007	2006	2007
Total	87,82	84,27	100,0	100,0
Public Sector	11,33	13,45	13,0	16,0
Academic Sector	28,64	38,18	33,0	45,0
Non Profit organizations	4,13	4,88	5,0	6,0
International Organisms	0,03	0,03	0,0	0,0
Firms Sector (R+D)	43,68	27,73	50,0	33,0

Source: National survey of science, technology and innovation to Firms. Costa Rica. 2008. MICIT-CINPE/UNA.

Graph 5

Costa Rica: Importance of different types of U-PRC interaction with firms (%)



Source: Own elaboration based on Universities and

Table 3

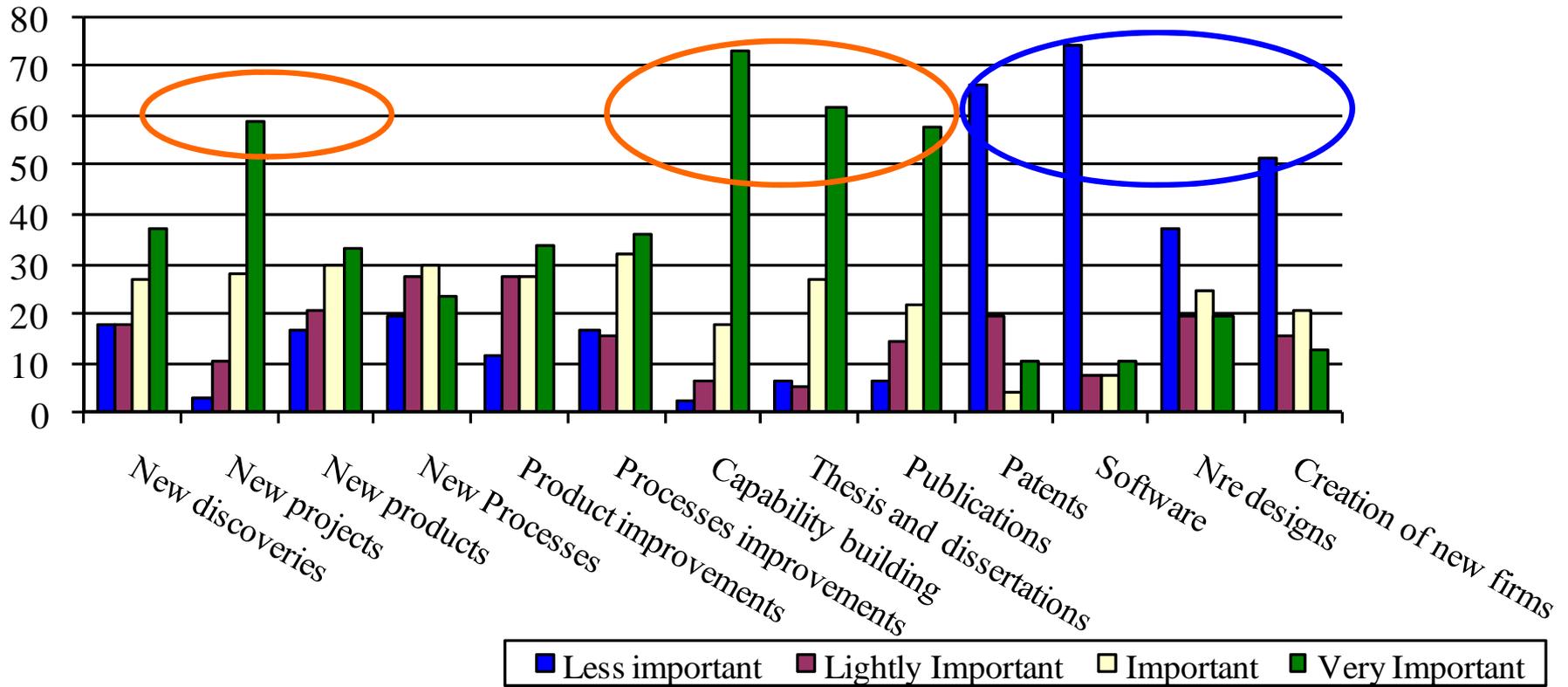
Relations between R&D and Industry-university linkages, by size of the firms

In percentages

		Do not invested in R&D	Invested in R&D	Total
Having linkages with universities	25,4	23,3	76,7	
Small firms		28,6	71,4	100,0
Medium firms		29,0	71,0	100,0
Large firms		8,3	91,7	100,0
Without linkages with universities	74,6	60,0	40,0	
Small firms		63,1	36,9	100,0
Medium firms		62,2	37,8	100,0
Large firms		54,0	46,0	100,0

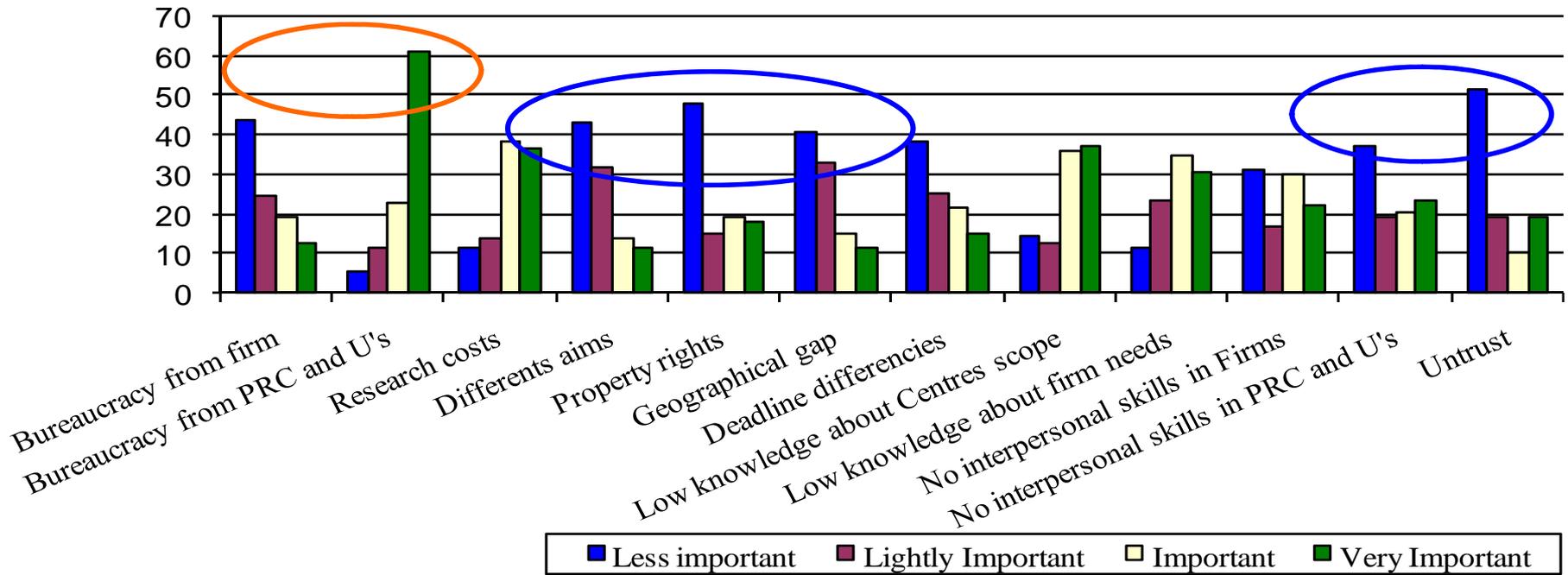
Source: Own elaboration with data from Costa Rica: National Survey of Science, Technology and Innovation, 2006-2007

Graph 6
U-PRC interactions with firms in Costa Rica : main results
(percentages)



Source: Own elaboration based on the survey to Universities and PRC

Graph 7
Costa Rica: Main barriers in the relationship with firms
(percentage)



Source: Own elaboration based on Universities and PRC

TABLE 5
SUCCESSFUL LEVEL OF COLLABORATION BETWEEN UNIVERSITIES AND PUBLIC
RESEARCH CENTRES WITH THE INDUSTRY
(IN TERM OF ACHIEVEMENT OF OBJECTIVES)

	Percentage
a) Yes, Collaboration have been successful to reach the objectives	<i>63,7%</i>
b) No, Collaboration have not been successful to reach the objectives	<i>8,9%</i>
c) Collaboration is ongoing, but objectives will be reached on time	<i>25,0%</i>
d) Collaboration is ongoing, but objectives will not be reached	<i>2,4%</i>
TOTAL:	<i>100,0%</i>

Source: National Survey of Science, Technology and Innovation. Costa Rica, 2008.
MICIT-CINPE/UNA.

Conclusions (1)

- One possible contribution of universities to sustainable development is by the influence on innovation and technological change in firms.
- The responsibility of universities is to orient their research agendas considering the different dimensions of sustainable development.
- The curricula must be actualized in order to produce professionals that solve problems considering the principles of sustainable development.
- The linkages with the industry must be also oriented by the principles of sustainable development, especially in those projects that directly contribute to R&D processes.

Conclusions (2)

- most of the R&D efforts in the country are done in the universities and public research institutes.
- Because of that, the kind of research developed by universities is very relevant in the country.
- However, several limitations avoid stronger interactions with the industry, hindering innovation processes.
- Many of those limitations are originated inside the universities and public research centers.
- Most of the may be overcome with institutional changes to avoid the bureaucracy and excess of requirements that delay the links with firms.