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What Determines Enterprises' Perceptions of Future Development in Higher Education – Strange Bedfellows?

Tomaž Deželan,¹ Jason Laker² and Samo Pavlin³

ABSTRACT

Over the last few decades, global changes (e.g. an increasingly integrated world economy, new technologies, the emergence of an international knowledge network) have increasingly determined developments in European higher education. Policymakers addressed these challenges using processes that support the practical orientation of higher education, among others the university–business cooperation. One of the key policy concerns is the extent to which higher education will be able to support graduates' early careers and to cooperate with business in general. Because employers are becoming increasingly important stakeholders and partners in the creation of higher education policy, the future developers of higher education need to know what employers expect of future development and whether they will meet or resist those expectations when it comes to their input. In this paper, we identify the areas that need to be improved and examine the ways in which employers' existing experiences in higher education determine their perceptions of it. Building on the EMCOSU (Emerging Modes of Cooperation between Private Sector Organisations and Universities) survey we analysed responses from executives of 396 companies based in five European countries. The analysis indicated that the level companies participate in university-business cooperation importantly influence their perception of the way higher education institutions should develop in the future. To be precise, companies with more experience in university-business cooperation pressed for more strategic cooperation between universities and business, more support to international orientation of academic institutions, and less attention to immediate valorisation of applied research, practical orientation and short-term skill development.

Keywords: higher education, university–business cooperation, higher education reform, higher education policy, Europe

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Introduction

Over the last few decades, global changes have increasingly determined developments in European higher education. Altbach et al. (2009, p. iv) defined these changes as “*as the reality shaped by an increasingly integrated world economy, new information and communications technology (ICT), the emergence of an international knowledge network, the role of the English language, and other forces beyond the control of academic institutions*”. Countries such as Brazil, Russia, China and India, which until recently mainly competed through the use of cheap labour, are challenging traditional Western leaders in innovation and knowledge production (Friedman, 2006), even though they face various obstacles in becoming new academic superpowers (Altbach, 2013). Similarly, professions and human resources in the Western world are experiencing deregulation, the precarity of work and the flexibility of labour markets, which is in line with a neoliberal doctrine. These phenomena have been accompanied by policies based on the knowledge-based economy and the Lisbon Strategy (Pavlin & Svetlik, 2014). This period has been marked by the massification of higher education in which the key problem identified by policymakers relates to the “*more efficient*” flow of knowledge from higher education to the world of work (Pavlin, 2014). In this setting, the challenge for higher education is to adjust the academically determined composition of knowledge with professional requirements.

Policymakers have recently addressed these challenges using two related processes that support the practical orientation of higher education. The first process involves the professional relevance of higher education in general and the problem of linking the determinants of professional success (e.g., work experience, teaching modes, learning etc.) with the components of career success (e.g., quality of jobs, job satisfaction, skill match etc.) (Pavlin, 2014). The second process refers to university–business cooperation and the problematic relationship between such cooperation modes, drivers, barriers and outcomes (Davey *et al.*, 2011). Both discourses—employability and university–business cooperation—have now moved beyond the arena of higher education. The employability discourse has been related to the labour market, particularly youth unemployment, while university–business cooperation has been related to key stakeholders in education and research as postulated by “the triple helix model” (Etzkowitz, 2008).

Increasingly, relations between the private sector and academic world have introduced the narratives of “strange bedfellows”, “hegemonic bargain”, “be careful what you wish for”, “from criticality to instrumentalism”, and “public-private partnerships are rarely partnerships”. These terms have been used in the discussion on academic de-professionalisation. Particular attention has been paid to changes in the academic profession in terms of work intensification, the hunt for projects, technocratic control over academic work, and the distinction between research and teaching (Musselin, 2007; Krause, 2009;). Higher education professionals have become increasingly responsible for acquiring financial resources, which is reflected in the hybridisation of the tasks of administrators and academics (Whitchurch, 2004; Musselin, 2007). In some countries, policymakers have introduced indicators of “performativity” in higher education, which, among other things, measure the number of successful applications, quality and auditing measures as well as the collaboration with industry (Leisyte & Dee, 2012). Reactions to the increasing orientation of the academic world to the business world vary. While employers and the public primarily believe that higher education should establish stronger links with enterprises, most academics still firmly support the idea of academic freedom (Pavlin, 2014) and the importance of avoiding purely instrumental and financial interests. However, differences exist. According to Lam (2010), on one hand is the traditional academic who believes academia and industry should be distinct; on the other hand is the more entrepreneurial academic who believes in “*the fundamental importance of science-business collaboration*”.

In this context, a key policy concern is the extent to which higher education will be able to support graduates' early careers and to cooperate with business in general. Because employers are becoming increasingly important stakeholders and partners in the creation of higher education policy (Pavlin, 2011; Pavlin, 2012), the future developers of higher education need to know what employers expect of future development and whether they will meet or resist those expectations when it comes to their input. In this paper, we first identify the areas that in the view of enterprises need to be "*modernised*". Second, we examine the ways in which employers' existing experiences in higher education determine their perceptions of it. We assume that in this respect, employers do not represent a black box and that there are big differences in their perceptions. We assume that existing university–business practices significantly shape the future of European higher education. Indeed, "*the more successful public entrepreneurial universities are today, the greater the chances are of them following this entrepreneurial direction in the future*" (Kwiek, 2009, p. 218).

The context of employers' idea of *future* higher education

Nearly two decades ago, the beginning of the Bologna Process marked an important milestone in synchronising the "*modernisation*" of higher education. This process can be perceived as the coordinated action of European governments, academics, non-profit and student organisations with regard to (Zgaga, 2004, p. 15) new social demands (study massification, distance and lifelong learning etc.), the relationship with the economy (emergence of researchers in companies and university-business cooperation etc.), the relationships between universities, such as the mobility of students and professors, and the relationships within universities mainly in terms of specialisations. Since then policymakers have managed to synchronise the system from above while higher education institutions have diversified the number of their programmes in order to become competitive. Teichler (2008, pp. 351–352), for example, questioned the implications of general policy assumptions, as follows: i) *expansion of student enrolment is desirable and expansion is intertwined with diversification of higher education establishments*, ii) *increasing diversity of higher education establishments is beneficial in terms of quantity, quality, relevance and efficiency of higher education*, iii) *diversification is multi-dimensional, but the single most important dimension of diversity of higher education is research quality* and iv) *the vertical dimension of diversification is more relevant than the horizontal dimensions*. According to Altbach (2013, p. x), the massification of higher education has reduced its quality because "*less money is spent on each student, and the conditions of study have deteriorated*". Furthermore, there is greater diversification among top universities and institutions at the bottom of the hierarchy, many countries have failed to ensure that their higher education systems are able to serve varied needs and populations, the quality of the academic profession has deteriorated and the private sector has expanded. After the Bologna Process, developments in higher education were accompanied by the concepts of new public management, globalisation, marketisation, new steering directions, funding and resource conditions, neo-liberal ideology, competition, commodification and marketisation (Meek *et al.*, 2009). These concepts have raised questions about whether higher education institutions are becoming drivers of innovation or followers of whatever will occur in the future. Indeed, what can we expect in the future?

In 2008, a survey of 289 executives was conducted in the academic community and the world of work in the USA, Europe and the Asia-Pacific. The majority of respondents reported that as a result of university–business cooperation, technology would have an impact on the duration of courses, changes in credit systems, increases in multidisciplinary, greater cooperation among universities, flexibilisation of the curriculum and specialisation of degrees

(Economist, 2008). Lefrere (2007, pp. 203–204) noted that the extrapolation of the trends of in recent years indicated the following: competition for work in higher education institutions, increased commercialisation of research, pressure to develop distance-learning tools, diversification of teaching-focused and research-led universities, a growing need to support graduates' careers and enhance student satisfaction with teaching, further diversification of courses in order to accept less capable students and so forth. Based on the predictions of several “futurists”, the author labelled six very distinct scenarios (Lefrere, pp. 201–202): i) the traditionalist scenario slows mass education and marketisation and reorients them towards traditional learning; ii) the private funding of higher education institutions scenario; iii) a market-led scenario concentrating on specialist niches; iv) a continuing professional development and lifelong learning scenario in which universities that certify courses are moved into the private sector; v) a learner-led scenario in which learners design their studies; and vi) an informal learning scenario in which formal tertiary education disappears. Current developments fall in between these scenarios, and strong variations exist among fields of study and national particularities.

The Organisation for Economic Cooperation and Development (OECD) (2015) provided another set of scenarios of the future development of higher education, which included the following: i) *open networking* based on strong internationalisation connects “*institutions, scholars, students and with other actors such as industry. It is a model based more on collaboration than on competition*”. In this scenario, knowledge is openly available, and students have a great deal of autonomy regarding how to plan their studies via modularisation; ii) *servicing local communities*, which presumes support for national and local developments, particularly in the research and development of human resources; iii) new public responsibility that integrates private initiatives and benefits from foreign education markets; and iv) “*higher education Inc.*”, which presumes strong global competition and the privatisation of education. Altbach *et al.* (2009, p. xx) stated that most scenarios would be affected by the current economic crisis. The implications would include significant constraints on the budgets for research, restrictions on loan programmes where they exist, pressures to establish or increase tuition fees, reduced development of new facilities and technology, all of which might be reflected in the overall deterioration of quality.

A central theme that remains on the agenda concerns the question of whether European universities in the future will retain the Humboldtian research-teaching model. According to Deem (2006, p. 298), “...*whilst academics remain motivated by research as well as teaching, the transformation of the European Humboldtian tradition into a post-Humboldtian one is still far from complete and is likely to be resisted*”. This is especially the case as different kinds of organisations compete for public funding, whereas many universities try to survive the game by producing rising student enrolment numbers but are expected to become more practical in their nature. This might shift the traditional role of higher education institutions from being innovators to being facilitators of ongoing developments that are dictated by the external world. According to Teichler (2003, pp. 177), such developments might trigger a bureaucratic and managerial university that is characterised by the jurisdiction of managers, a larger number of new higher education professionals combined “*with a reduction of the role of the academic profession*”, and the “*growing role of mechanisms of evaluation, reporting*”.

As indicated above, higher education institutions are expected “*to do more with less*” (OECD, 2010). This implies the notion that revenue sources—particularly governments—will continue to decline in favour of tuition increases and/or private sector investments (ideally, also non-profit philanthropy, but that is thus far a hope rather than reality). To achieve this, they need a strong and well-resourced external partner, which would probably require practically oriented higher education and better skills in graduates. Based on past surveys (e.g., Allen *et al.*, 2011), we already know which competencies employers seek from

graduates of higher education and which areas have competency shortages and surpluses. However, little is known about how higher education could generate these competencies and whether institutions could do it alone. Other surveys (Pavlin & Svetlik, 2009; Pavlin, 2014) revealed that higher education institutions consider themselves far more important actors than employers in generating competencies. Employers report a shortage of competencies in graduates more than graduates do. Higher education institutions perceive traditional learning modes as a suitable vehicle for developing competencies, whereas both graduates and employers prefer active learning modes, such as problem-based learning or teamwork, as key factors in generating competencies. Empirical data have shown that employers are satisfied with the level of theoretical knowledge acquired by graduates, but they are less satisfied with their practical experience. Based on empirical results, we assume that among all competencies, employers require young graduates to be a master in their own field, have the ability to work under stress, engage in teamwork, be proficient in time management and have the ability to work with a computer and the Internet (ibid.).

Based on information gathered from past surveys and international conferences (Pavlin & Svetlik, 2009; Pavlin, 2011; Pavlin, 2012), some blueprints of how employers imagine the future development of higher education have already been provided. As expected, employers' views of the main labour market for graduates of higher education were related to an increase in practical work, traineeships, university–business cooperation, adaptation to employers' needs, improvements in the financial system, curriculum development, greater professional relevance, flexibility, an international orientation and improvements in teacher training and research. In terms of developing competencies, employers agreed that universities should *“direct their teaching processes more towards practical issues; “increase practical work of students; give more practical courses for specific professional competencies and be involved in higher education decision making processes”* (Pavlin & Svetlik, 2009). The Pavlin & Svetlik (2009) survey revealed that in some European countries, employers had complained about the quality of practical training, the low level of adapting curricula to employers' needs, as well as the weak mobility of academics and students. In general, most of them believed in the idea of the discrepancy between *“good practice”* and *“bad theory”*. In this setting, the emerging agenda of university–business cooperation brings with it several open policy questions such as the following:

- i) What is the overall idea of the relationship between universities and enterprises and what is the workable middle ground for cooperation?
- ii) How can the better quality and synergy of various university-business cooperation modes be ensured, including research and development, mobility of students, their transition from education to the labour market and the accreditation of relevant work experience?
- iii) Which are the key areas of university–business cooperation, and to what extent should universities be accessible and amenable to people from the world of work?
- iv) What are the main drivers of and barriers to university–business cooperation?

In the remaining part of the paper, we focus on the aspect of how employers perceive the future development of higher education because their opinion is no longer considered unimportant or trivial.

Results and discussion

Method and data

Based on a review of the literature and interviews with experts in the field of university–business cooperation (UBC), a survey questionnaire was designed using the framework of the Emerging Modes of Cooperation between Private Sector Organisations and Universities (EMCOSU) project (see Melink *et al.*, 2014). The EMCOSU survey asked the following:

What are the most dominant UBC modes, the rationales for them, their key characteristics, perceived avenues of future cooperation and the main drivers of UBC. Because this survey was also aimed at bettering the understanding of industry's expectations of universities, controlling for experiences in university collaboration, it proved an excellent source of information to help us reach our research goals. In line with the knowledge accumulated in research on UBC (e.g., Davey *et al.*, 2011) the subjective information provided by the survey respondents is generally of very high utility (Walters, 2004) although it has been frequently ignored because of the respondents' level of experience and assessment capabilities (Lowe & Krahn, 1995). In line with other surveys in the field of UBC (e.g., Bacila *et al.*, 2009; Jung, 2011; Okamuro *et al.*, 2011; Iammarino *et al.*, 2012; Yeo & Lee, 2012; De Marchi & Grandinetti, 2013; Hewitt-Dundas, 2013; Plewa *et al.*, 2013; Sohal, 2013; Franco *et al.*, 2014; Isabel Maria *et al.*, 2014; Muscio & Vallanti, 2014; Plewa *et al.*, 2015), the target enterprises were examined by non-probability sampling, implementing principles of quota, purposive and convenience sampling (sector distribution, size of the company, evidence of UBC, geographical scope and level of technological advancement; for a detailed description of the sampling procedure, see Melink *et al.*, 2014, pp. 13–14).

The survey addressed the enterprises of 396 companies in five countries (Bulgaria, Hungary, Poland, Slovenia and Spain). The questionnaire targeted representatives of companies that had insight into the firm's UBC experience or active involvement in such cooperation. The majority of the respondents were managers (CEOs, directors, executive directors and general managers), followed by human resources experts and specialist managers (e.g., heads of departments). The vast majority of the responding companies were private for-profit organisations (88 per cent), public companies (7 per cent) and private non-profit organisations (3 per cent). The sample comprised the following: 34 per cent were large organizations (more than 250 employees), 56 per cent were small and medium enterprises (from 10 to 250 employees) and 10 per cent were micro companies (less than 10 employees). In addition, 42 per cent of the organizations were in the industrial sector, 34 per cent were in the service sector and 24 per cent were in the information and communication technology sectors. The surveying was conducted between November 2013 and June 2014.

In our analysis, we employed the binary logistic regression technique (see Hosmer & Lemeshow, 2000; Kleinbaum & Klein, 2010) to model the links between opinions about the extent to which higher education institutions (HEIs) should change in the future and the existing cooperation with/engagement in activities concerning UBC while controlling for the economic sector and profit orientation. Similar to seminal studies in the field, we built regression models by testing theoretically relevant variables for statistical significance, thus side tracking the power of probability. The following dependent variables, which measured opinions regarding the future changes of HEIs to facilitate UBC, were included in the analysis: increase in the practical orientation of teaching, enhancement of traineeships and internships, improvement in HEIs' financial systems, focus on short-term and long-term skill development, support for international orientation, focus on research and development, strategic cooperation with business and enabling the valorisation of applied research. The independent variables were the following: a) the extent the organisation cooperates with HEIs (R&D; mobility of academics; mobility of students; curriculum development and delivery; adult education, training and short courses); b) frequency of the organization's engagement in activities related to HEIs (participation of academics on company boards; participation of business on HEI boards; participation in alumni networks; cooperation with HEIs' career counselling offices; cooperation with institutes focused on UBC; cooperation with incubators for the development of new businesses; participation of the business in study, teaching and research activities); c) type of organization; and d) economic sector of organization (see Melink *et al.*, 2014 for a detailed description of the variables).

Results

The opinions about the way HEIs should change in the future varied considerably. The survey participants in the business side of UBC perceived that some aspects of HEIs were in need of more change than others were. Before examining each variable that was used to explore how and to what extent HEIs needed to change in the future, we observed that the business representatives generally believed there was much to be done by the universities. Specifically, the distribution of the responses was heavily skewed in favour of the need to change to a high extent: most respondents ticked the highest three points on the scale (see Table I). The aspects that were perceived to be the most in need of change were the essence of UBC itself: strategic cooperation with business (Mean = 6.19 on a 7-point scale) and the classical Napoleonic idea of the increase in the practical orientation to teaching (Mean = 6.04). Closely following were enhanced traineeships and internships (Mean = 5.71), support for an international orientation (Mean = 5.53) and the focus on long-term skill development (Mean = 5.49). The business representatives responded that the focus on long-term skill development should not be highly prioritized (Mean = 4.47), which indicates that business strategically thinks about universities. Similarly, somewhat less prioritized was the need for universities to improve their financial systems. It was clear that in the post-2008 recession period, most universities in the examined countries had undergone severe budget cuts and financial rationalizations.

Table I. Descriptive statistics of the variables regarding business perceptions of future changes in HEIs (*In your view, to what extent should HEIs change in the future?*)

	<i>Increase the practical orientation of teaching</i>	<i>Enhance traineeships and internships</i>	<i>Improvements in their financial systems</i>	<i>Focus on short-term skill development</i>	<i>Focus on long-term skill development</i>	<i>Support an international orientation</i>	<i>Focus on research and development</i>	<i>Enabling the valorisation of applied research</i>	<i>Strategic cooperation with business</i>	
Mean	6.04	5.71	4.96	4.47	5.49	5.53	5.21	5.33	6.19	
Median	6.00	6.00	5.00	4.00	6.00	6.00	5.00	5.50	7.00	
Mode	7	7	7	4	7	7	7	7	7	
Skewness		-1.434	-1.011	-.422	-.142	-1.110	-1.031	-.493	-.665	
Kurtosis	1.869	.690	-.578	-.973	.845	.435	-.391	-.227	3.344	
Std. Deviation	1.238	1.308	1.601	1.764	1.506	1.558	1.470	1.523	1.166	
Percentiles	25	5.00	5.00	4.00	3.00	5.00	5.00	4.00	4.00	6.00
	50	6.00	6.00	5.00	4.00	6.00	6.00	5.00	5.50	7.00
	75	7.00	7.00	6.00	6.00	7.00	7.00	7.00	7.00	7.00

(7-point scale: 1-Not at all, 7-To a very high extent)

Based on the selected variables, we constructed nine binary logistic regression models because we chose the same number of dependent variables to measure the opinion of business representatives about the extent to which HEIs should change in the future. The omnibus test of coefficients, -2 log likelihood (-2LL) statistics, the Hosmer–Lemeshow test and the Nagelkerke R^2 were used as key measures of the goodness of fit of the nine models. The omnibus test of coefficients was used to determine the significance of an improvement in the new model, and the explanatory variables were included in the baseline model. The results showed that all nine models were a significantly better fit than the null model was. The Hosmer-Lemeshow test was used to test the null hypothesis that the predictions made by the model fit perfectly with the observed group memberships. The nonsignificant chi-square indicated that the data fit the model well for all the estimated models except Model 5. The results of the Nagelkerke R^2 indicates how much the degree of variation in the dependent variable is explained by the model. The results suggested that Model 2 (22.7 per cent) and Model 4 (22.5 per cent) explained most variation in the dependent variable.

The classificatory ability of the models was evaluated using a classification table that included the following measures: overall success rate (percentage of correct predictions), sensitivity (percentage of correct predictions of the event), specificity (percentage of correct predictions of the non-event), false positive rate (percentage of predicted event that were observed as non-event), false negative rate (percentage of predicted non-events that were observed as events). Model 4 recorded the best overall success rate (83.8 per cent). The highest sensitivity was observed in Model 9 (69.8 per cent) and the highest specificity was observed in Model 8 (98.1 per cent). The highest false positive error rate in classification (predicted event as if it occurred when it did not occur) was observed in Model 1 (35.7 per cent), and the lowest was observed in Model 7 (25.0 per cent). The highest false negative error rate in classification (predicted event as if did not occur when it did occur) was observed in Model 9 (39.5 per cent), and the lowest was observed in Model 4 (15.3 per cent). In terms of the ROC curve diagnostic,⁴ for all estimated models (except Model 5) the area under the ROC curve was significantly different from $p = 0.05$, which means that the specified models classified the event/group significantly better than by chance. Four models (Models 1, 5, 6 and 7) were “poor” (0.6–0.7) at separating an event from a non-event. The remaining five models (Models 2, 3, 4, 8 and 9) were “fair” (0.7–0.8) at separating an event⁵ from a non-event.⁶

⁴ The area under the ROC curve ranged from 0.5 and 1.0. Larger values indicated better fit. Values closer to 1 indicated a reliable predictor, while values closer to 0.5 indicated a predictor no better than chance.

⁵ Because the distribution was highly skewed, the event or the category of interest encompassed a very high value on the 7-point scale (very high = 7), while the non-event encompassed other values on the same scale (other = 1, 2, 3, 4, 5, 6). For details, see Table I.

⁶ The criteria for the quality of the model were as follows: 0.9-1 = excellent; 0.8-0.9 = good; 0.7-0.8 = fair; 0.6-0.7 = poor; 0.5-0.6 = fail.

Table II. Binary logistic regression models for business's perception of HEIs' changes in the future (*In your view, to what extent should HEIs change in the future?*)

	Increase the practical orientation of teaching (Model 1)		Enhance traineeships and internships (Model 2)		Improvements in their financial systems (Model 3)		Focus on short-term skill development (Model 4)		Focus on long-term skill development (Model 5)	
	b	Exp(b)	b	Exp(b)	b	Exp(b)	b	Exp(b)	b	Exp(b)
Constant	0.629	1.876	0.291	1.338	-1.669	0.188	-0.918	0.399	-1.771	0.170
Industry sector	-0.150	0.861	-0.251	0.778	-0.781	0.458**	-0.075	0.928	0.271	1.311
Service sector	-0.101	0.904	-0.237	0.789	-0.463	0.629	0.066	1.069	0.291	1.338
Public organisation	-1.064	0.345	-1.932	0.145**	0.193	1.213	-1.449	0.235	0.295	1.343
Private non-profit organisation	-0.785	0.456	-2.160	0.115*	-0.533	0.587	-0.886	0.412	0.921	2.513
Private profit organisation	-0.878	0.415	-1.605	0.201**	-0.027	0.973	-0.973	0.378	0.531	1.701
<i>Cooperation with HEIs regarding ...</i>										
research and development	-0.051	0.950	-0.123	0.884	0.055	1.057	-0.137	0.872	-0.087	0.917
mobility of academics	-0.204	0.815**	-0.109	0.897	-0.052	0.950	-0.149	0.862	0.058	1.060
mobility of students	-0.096	0.908	-0.084	0.919	-0.140	0.870	-0.155	0.857*	-0.055	0.947
curriculum development and delivery	0.063	1.065	0.016	1.016	0.040	1.040	0.079	1.082	0.040	1.041
adult education, training and short courses	0.064	1.066	0.174	1.190***	0.218	1.244***	0.058	1.060	-0.052	0.950
<i>Engagement in activities regarding ...</i>										
participation of academics on company boards	-0.085	0.919	0.048	1.050	0.007	1.007	0.071	1.074	0.119	1.127
participation of business people on HEIs boards	-0.279	0.756***	-0.299	0.742***	-0.141	0.868	-0.241	0.786**	-0.016	0.984
participation in the activities of alumni networks	0.145	1.156	0.129	1.138	0.024	1.024	0.103	1.108	0.088	1.092
cooperation with HEIs career offices	0.084	1.088	0.056	1.058	0.051	1.052	0.225	1.252***	0.072	1.075
cooperation with institutes focused on UBC	0.145	1.156**	0.251	1.285***	0.015	1.015	-0.092	0.912	0.055	1.057
cooperation with incubators for the development of new businesses	0.066	1.068	0.035	1.036	0.071	1.074	0.015	1.016	-0.060	0.942
participation of business people in study, teaching and research activities	0.093	1.097	0.072	1.075	0.037	1.038	0.154	1.167	-0.040	0.960
Omnibus test (df=17)	66.404***		78.502***		46.939***		64.196***		16.072	
Hosmer-Lemeshow test (df=8)	14.453		13.242		4.840		10.350		12.479	
-2LL	539.222		486.913		404.678		346.420		514.065	
Nagelkerke R ²	0.188		0.227		0.159		0.225		0.052	
Overall success rate (%)	63.8		72.9		80.0		83.8		70.8	
Sensitivity/ specificity (%)	57.0/ 70.4		43.5/ 89.0		17.0/ 97.6		21.5/ 97.7		7.6/ 98.3	
False positive/ false negative rate (%)	35.1/ 36.9		31.6/ 25.8		33.3/ 19.2		32.0/ 15.3		33.3/ 29.0	
Area under the ROC curve	0.696**		0.730**		0.711***		0.757***		0.600**	

Notes: *p<0.1; **p<0.05; ***p<0.01

Table II continued

	Support an international orientation (Model 6)		Focus on research and development (Model 7)		Enabling the valorisation of applied research (Model 8)		Strategic cooperation with business (Model 9)	
	b	Exp(b)	b	Exp(b)	b	Exp(b)	b	Exp(b)
Constant	-0.995	0.370	-1.445	0.236	-0.995	0.370	-1.445	0.236
Industry sector	-0.119	0.888	-0.316	0.729	-0.360	0.698	-0.336	0.715
Service sector	0.142	1.152	-0.200	0.819	-0.105	0.900	-0.310	0.734
Public organisation	-0.595	0.551	-0.230	0.795	-0.445	0.641	-0.129	0.879
Private non-profit organisation	-0.269	0.764	-0.375	0.687	-1.262	0.283	-1.295	0.274
Private profit organisation	-0.245	0.783	-0.538	0.584	-0.481	0.618	-0.555	0.574
<i>Cooperation with HEIs regarding ...</i>								
research and development	0.051	1.052	0.114	1.120	0.197	1.218***	-0.078	0.925
mobility of academics	-0.154	0.858	-0.043	0.958	-0.178	0.837	-0.059	0.943
mobility of students	-0.065	0.937	-0.056	0.946	-0.048	0.953	0.033	1.033
curriculum development and delivery	0.002	1.002	0.013	1.013	0.165	1.179**	0.122	1.130
adult education, training and short courses	0.067	1.069	0.186	1.204***	0.169	1.184**	0.149	1.161**
<i>Engagement in activities regarding ...</i>								
participation of academics on company boards	0.161	1.175**	0.060	1.061	-0.067	0.935	0.066	1.068
participation in the activities of alumni networks	0.151	1.163**	0.029	1.030	0.007	1.007	-0.012	0.988
cooperation with HEIs career offices	0.084	1.087	0.052	1.054	0.078	1.081	0.125	1.133**
cooperation with institutes focused on UBC	-0.061	0.941	0.021	1.021	0.104	1.110	0.110	1.117
cooperation with incubators for the development of new businesses	0.066	1.069	-0.016	0.984	0.079	1.082	0.128	1.137
participation of business people in study, teaching and research activities	0.044	1.045	0.062	1.064	-0.050	0.951	0.045	1.046
Omnibus test (df=17)	39.546***		33.676***		67.657***		74.070***	
Hosmer-Lemeshow test (df=8)	12.003		14.259		14.793		6.523	
-2LL	529.615		460.437		462.234		522.697	
Nagelkerke R ²	0.119		0.075		0.063		0.210	
Overall success rate (%)	69.8		77.2		76.3		64.5	
Sensitivity/ specificity (%)	34.8/ 89.9		16.2/ 98.1		37.7/ 92.8		68.8/ 59.3	
False positive/ false negative rate (%)	33.7/ 29.3		25.0/ 22.6		31.0/ 22.3		32.4/ 39.5	
Area under the ROC curve	0.655***		0.667***		0.723***		0.723***	

Notes: *p<0.1; **p<0.05; ***p<0.01

The results of the binary logistic regression of Model 1 showed that the odds of the perceived extent of the future change of HEIs regarding the increase of practical orientation of teaching rose by 1.226 with every decrease in one level of the extent of organisational cooperation with HEIs regarding the mobility of academics. In other words, the higher the extent of the firm's cooperation with universities in terms of the mobility of academics, the lower the perceived need for HEIs to increase the practical orientation of teaching in the future. Furthermore, the odds of the perceived need for HEIs to change to a very high extent in terms of practical orientation increased by 1.323 with every decrease in one level of the extent of organisation's participation on HEI boards. Participation on HEI boards therefore decreased the perceived need for the increased practical orientation of teaching. Interestingly, the effect of cooperation with institutes focused on UBC showed the contrary: the odds of a very high extent of HEIs changing in the future regarding the greater practical orientation of teaching increased by 1.156 with every decrease in one level of the extent of organisational cooperation with institutes that were focused on UBC.

In terms of the perceived need to enhance traineeship and internship schemes (Model 2), the odds of the representatives of non-public organisations to perceive the need for HEIs to change to a very high extent were 6.897 times greater than of public organisations. In the case of organizations that were not private non-profit organisations, the need to change was 8.696 times greater than for private non-profit organisations. In the case of non-private profit organisations, the need to change was 4.975 times greater than for private profit organisations. In other words, the representatives of private non-profit organizations the least feel traineeship and internship schemes needed to be enhanced to a very high extent. These results were followed by the results of the responses of representatives of public organisations, private profit organizations and other organizational forms. Furthermore, the odds of perceiving that HEIs needed to change to a very high extent in the future regarding the enhancement of traineeships and internships increased by 1.190 with every increase in one level of cooperation with HEIs regarding adult education, training and short courses. In line with Model 1, the odds of the perceived very high extent of HEIs' need to change in the future regarding traineeships and internships increased by 1.348 with every decrease in one level of the extent of the organisational participation of business people on HEI boards. This result indicates that the participation of businesses on HEI boards would decrease the perceived need for traineeships and internships in the future. Interestingly, as in Model 1, the odds of a very high extent of perceived need for HEIs to change in the future increased by 1.285 with every increase in one level of the extent of organisational cooperation with institutes focused on UBC. Experience with institutes focused on UBC therefore again increased the perceived need for HEIs to change in the future.

Model 3 was used to investigate the perceived need to improve the financial systems of HEIs. The results revealed that the odds that the industry sector believed HEIs should improve their financial systems to a very high extent were 2.183 times smaller than for organizations in the other examined sectors (service and ICT). In addition, the odds of company representatives believing that HEIs financial systems should change to a very high extent increased by 1.244 with every increase in one level of the cooperation with HEIs regarding adult education, training and short courses.

Model 4 was used to examine the need to focus on short-term skill development. The results showed that the odds that representatives would believe HEIs should focus on this variable to a very high extent increased by 1.167 with every decrease in one level of the extent of the organisation's cooperation with HEIs regarding the mobility of students. This result indicates that the mobility of students contributes to firms' realization that short-term skill development is not the most important function of HEIs. Similarly, participation on HEIs boards showed a similar effect: the odds that the representatives of companies believed that

HEIs should focus on short-term skill development increased by 1.272 with every decrease in one level of the extent of an organisation's participation on HEIs boards. In contrast, the cooperation with HEIs career offices was positively associated with the perceived need to increase short-term skill development. This result shed a different light on the potential effects of career offices. In other words, the odds that the representatives of companies believed that HEIs should focus on short-term skill development to a very high extent increased by 1.252 with every increase in one level of the extent of the organisation's cooperation with HEIs career offices.

Model 6 was used to examine the perceived need to support international orientation. The results revealed that the odds of supporting this need to a very high extent increased by 1.175 with every increase in one level of the extent of the organisation's inclusion of academics on company boards. A similar effect was identified for the participation of companies in the activities of alumni networks. The odds of business representatives believing that HEIs should support international orientation to a very high extent increased by 1.163 with every increase in one level of the extent of the organisation's participation in the activities of alumni networks. In contrast, the participation of businesses on HEIs boards produced a different effect. The odds that the surveyed representatives of companies would believe that HEIs should support international orientation to a very high extent increased by 1.168 with every decrease in one level of the extent of the business's participation on HEIs boards.

Model 7 was used to determine whether the intensive participation of business representatives on HEIs boards would decrease the belief that HEIs should focus on research and development to a very high extent. The results showed that the odds of representatives of firms believing that HEIs should focus on research and development to a very high extent increased by 1.185 with every decrease in one level of the extent of the organisation's participation on HEIs boards. In contrast, regarding the cooperation of firms in terms of adult education, training and short courses, the surveyed organizations indicated that HEIs should focus on research and development. The results showed that the odds of surveyed representatives believing that HEIs should focus on research and development to a very high extent increased by 1.204 with every increase in one level of the company's cooperation with HEIs regarding adult education, training and short courses.

Model 8 was used to examine the extent to which HEIs should enable the valorisation of applied research. The results showed that cooperation with HEIs in terms of research and development was positively associated with the valorisation of applied research. The odds of the surveyed representatives believing that HEIs should enable the valorisation of applied research to a very high extent increased by 1.218 with every increase in one level of the company's cooperation with HEIs regarding research and development. Similarly, the odds increased by 1.179 with every increase in one level of the company's cooperation with HEIs regarding curriculum development and delivery. Similarly, the odds of the surveyed representatives of companies believing that HEIs should enable the valorisation of applied research to a very high extent increased by 1.184 with every increase in one level of the company's cooperation with HEIs regarding adult education, training and short courses. In contrast, the participation of business on HEI boards was associated with the diminished belief that valorisation was important. The odds of the surveyed participants believing that HEIs should enable the valorisation of applied research to a very high extent increased by 1.282 with every decrease in one level of the extent of the organisation's participation on HEI boards.

Model 9 was used to determine whether strategic cooperation with business was associated with several aspects of the existing cooperation and intensity of engagement. The odds of surveyed representatives of companies believing that HEIs should strategically cooperate

with business to a very high extent in the future increased by 1.161 with every increase in one level of the company's cooperation with HEIs regarding adult education, training and short courses. Cooperation with HEIs career offices was similarly associated with the belief in the need for strategic cooperation in the future. The odds that the surveyed representatives would believe that HEIs should focus on strategic cooperation with business increased by 1.133 with every increase in one level of the extent of organisation's cooperation with HEIs career offices. As in the case of some other models, the participation of business on the boards of HEIs functioned differently. The odds of business representatives believing that HEIs should focus strategically on cooperating with business to a very high extent increased by 1.188 with every decrease in one level of the extent of the organisation's participation on HEI boards.

Conclusion

Similar to other studies, the present study indulged in the use of a false binary: the question of whether HEIs and higher education in general should cooperate with or resist the private sector. When higher educational institutions were organised as finishing schools for elites, students from privileged families were funded by their association with industry and upon graduation entered that sector as entrepreneurs and employees. Hence, contemporary and realistic questions pertain to whether and how to recast relationships between HEIs and the higher education sector with organizations in the industrial sector. The governmental sector and policy makers mitigate, regulate and direct the variables associated with these questions. In short, funding is increasingly tied to so-called accountability measures and instruments that clearly privilege instrumental and market-driven interests.

The participation of representatives of the private sector on HEI boards and vice versa is arguably marginal given the broad context in which HEIs have less autonomy and are increasingly subject to the external demands caused by the distribution of resources. As in many other instances of interdependence, including the influence and aggression of organizations and sectors, it is perhaps more productive to explore how to make the best of the inevitable intersections between sectors. In this article, we approached these intersections in terms of HEIs and business organizations, which are both influenced and enforced by policymakers. This approach led us to theorize and contemplate a "both/and" arrangement in which it is understood that there will be decisions regarding resources, regulations and accountability, which will force HEIs to continue to cooperate with private sector organizations. Also understood is the prospect that such cooperation can—and should—be mutually beneficial. Indeed, if there is a battle to be waged, it is on the counter-narratives and resistance activities by HEI representatives (e.g., faculty, administrators and students) to demand, establish and rigidify a reciprocally respectful partnership in which both HEIs and the business sector benefit and to require that policymakers structurally reinforce this arrangement.

It is possible that the linchpin resides in students, whose increasing consumerism can both ensure that HEIs are accountable to teach them as whole persons and prepare them for success (and happiness?) in the world of work. Here again, the consumerism bemoaned and critiqued by academics might actually serve to mitigate and reshape the influence of the market to achieve a moderate balance between learning for its own sake and learning to earn a living. This theoretical middle ground might also achieve a balance that is valuable to the project of engagement of graduates in democratic citizenship. Such conjecture is theoretical because the current situation resembles a confederation of realities rather than one overarching reality. It is presently the case that some students do not complete their programme of study, some complete it but remain un/under-employed, some are adequately employed and some achieve wealth. The variables of these outcomes do not solely rely on the questions raised in this article. They are as complex and varied as humans and organizations.

For instance, a HEI that is regarded as prestigious might readily attract private sector partnerships and investments but could produce graduate students who are doomed to wealthy misery. Some HEIs that are seen as unimpressive can actually spend less energy, time and money on protecting their brand than their more “impressive” counterparts do, thus investing in students’ learning and success. HEIs that are focused on vocational programs might be marginalised in the sector, but they could graduate students who live well both personally and financially. Luck is also a variable, and it is not uncommon for a graduate from a basic school to achieve great professional and financial success and to take ongoing interest in supporting their alma mater and its students and graduates.

Despite the strong desire by the leadership of HEI and the business and government sectors to find a predictable pathway, human diversity and sensibilities serve to prevent the achievement of this goal. Moreover, the continued delusions slow the prospects for dynamism and synergy. Accordingly, we recommend a cluster of investments rather than a targeted investment. This could be achieved through communication, openness and increasing the proverbial “dipping of toes” in each other’s waters. Activities such as diverse representation on the boards of HEIs and private sector organisations, internships, practical and mentoring relationships, transparent and collaborative curricular experimentation, non-traditional educational delivery systems and settings, investments in student mobility, and collaborative research and applications all could support a respectful and positive engagement between sectors. Furthermore, the engagements and collaborations of NGOs, governmental and primary educational sectors have much to offer this dynamic and should be explored and piloted in future research.

Perhaps it is not that the various sectors are strange bedfellows, but instead they seem to have forgotten that they have been married forever. Some counselling and the willingness to subordinate egos to the relationship might bring us closer to solving a problem that, in any case, is difficult to articulate.

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