Graduate Career Tracking System Across the World - as Information Systems in higher Education Decision-making Process

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Abstract

All the higher education (HE) areas have faced significant changes in the last few decades. The traditional role of universities may become obsolete, and new tasks and strategic redefinition of the own position are necessary to fulfil the emerging needs. The 20th century shows evidence of aging societies in developed countries; decreasing capacity and willingness of state to participate in financing; the formulation and importance of knowledge-based society concept. While in developing countries a new expansion of HE participation is foreseen with increasing international mobility and appearance of IT based smart solutions like massive open online courses. These radical influences lead to a need for reform in HE. To develop new strategies, an emerging need for data-driven decisions arose, and we discuss whether it is due to the technological possibilities (push-based) or due to the decision making actors' requirements (pull-based).

The Graduate Career Tracking Systems (GCTS) and surveys offer an excellent source of objective data, but the practice varies widely from country to country. We analyze the empirical information regarding the GCTS solutions with the help of document analysis of different countries using research outputs, studies at the institutional level, at a network of institutions and nation-wide survey. Based on these, we created a possible categorization which contributes to understanding the role, structure and aims of GCTS within the countries, and the policy making process. Three different models were created by considering the following elements: the responsible institutions, the applied research methods, the surveyed basic population, the surveyed areas and the response rates. This in-depth analysis of the out of Europe models (short-term traditions or unstructured network of institutional surveys; long-term traditions of graduate tracking; compact student service package offered solutions) allows understanding better the possible ways to develop the European Graduate Career Tracking systems and formulate new policy making strategies regarding the higher education.

Keywords

Graduate Career Tracking System, Higher Education, labour-market, Student-services.

1. The changed framework of higher education

The higher education has undergone radical changes in the recent decades (Barakonyi, 2010), and certainly radical transformations will occur in the future because nowadays it has to react to every impact as integrated part of the society and the economy. To summarize the international trends affecting the higher education (Hrubos, 2014; Polónyi, 2014) we identified the following elements.

1. The traditional Humboldtian University concept was replaced by the approach of knowledge-based economy and society as supporting the value creation (Veroszta, 2010), and a rapidly growing demand appeared for let higher education accessible to broad masses. The number of training and institutions increased in a relatively short time (Kovács & Sipos, 2014), and the academic and administrative staff number kept pace with this. Basically, it is a demand pushed development.

2. As a result, the first signs of economic changes (oil crises of the '70s) forced the governments to realize that they have to play a significantly smaller financing role in the public services and the higher education, too. Private-funded institutions appeared in the market, which constitutes a significant competition to the state-financed ones regarding the student output quality. Then, the stabilization of the economic growth was accompanied by a greater expansion in higher education, until the former became questionable after the emerging crisis, mainly that of 2007. Consequently, the governments demanded a more direct control over the quality of the courses, and over the distribution of state-funded student places (Halász, 2012; Polónyi, 2012; Keresztes, 2014) This also means that market-orientation became a priority (fee-paying students) to finance the decreasing volumes of state-funds. The market expects that the processes and the operations be more transparent and responsible in the context of objective and subjective aspects of graduates' labor-market performance.

3. In addition to the introduction of the Bologna system and other international mobility programs, international student mobility is strengthened. (Duga & Szontágh, 2012; Komlódiné Pozsgai, 2014) HE institutions had to realize that the previously established competitive positions in the local markets are no longer sufficient to meet the challenges of the global market. New geographic areas can be reached, which is a great opportunity since most of the world's population does not live in developed countries and a greater need for HE expansion will happen. This also means that a cultural diversity and customer demand-side approach is required to assess these needs and to transform the training offer. (Hrubos, 2014).

4. In developed countries it is clearly evident, whilst in developing ones a delay is foreseen in facing a gradual but steady aging of society, and an excess in capacities. This problem is twofold: there is a shift in population age structure to a greater rate of inactivity, and also a part of HE institutions (staff included), has become obsolete. The potential closures face social resistance on the parts of intellectuals, local politicians, and economy actors. The HE institution is a prestige for the local administration and ensures a continuous presence of young people (Heindl, 2014; Kuráth & Sipos, 2013; Rechnitzer & Hardi, 2003), not to mention the multiplicative economic effect of their spending.

5. The general framework of education has changed, too. The appropriability of lecturers' knowledge declined in the classic sense, the direct lecturer-student relationship bonds loosened due to mass-education and to the decreasing need for personal presence. The online materials, the distance learning and Massive Open Online Courses shook the very foundations of the century-old ivory tower of higher education (Hrubos, 2012; 2014), creating new requirements for the institutions. It is further strengthened by the new generations of students using new technology and having different needs. (Balogh 2015; Törőcsik, 2011). The MOOCs has an enormous potential due to the million-student numbers, even considering the drop-outs and low-rate fee paying. In our view, the mass-based education in developing countries will not be engaged, but directly the MOOCs will have a significant impact on HE.

6. A further expansion of HE is foreseen, the major part of which will be realized in developing regions, thus the institutions must prepare for this.

All these factors have led to rethinking the institutional positions, which were previously representing and communicating absolute values and independence (and could be examined in itself), nowadays it is more likely that a loose network of service-offering points has to be considered, where quality is conceived in the context of the relative positions of the others. This is mainly caused by the greater extent of market-orientation which is a natural consequence of the above listed HE changes. HE transmits knowledge, culture, patterns, norms and values, which should be ensured on a high level of quality. (Deardoff, de Wit, Heyl, & Adams, 2012) It is clear that education is the basic task of HE; however, it is far uncertain what stands in the concept of quality. The average of the diploma can be a good measurement type for the quality, a summa cum laude

means more knowledge than a rite one, but it is easy to see that on the labour market – if the participants are aware at all of their differences – the former one not necessarily will prevail. This is because the 'know what' instead of 'know how' approach came to the fore. Therefore, entirely different employee skill-set is needed. Then consider as a sign of HE performance the percentage of graduates having a job within a year after graduation. We are not sure about it neither because we have to analyze whether they have a match for their qualifications, nor only the crowding out effect prevailed. We think that a valid, consistent and objectively reasonable ranking cannot be formed, even if a great variety of national and international rankings have been created to determine the differences between the performance of the HE institutions. All of them are criticized on different elements by many researchers. (Altbach, 2006; Fábri, 2008; 2010; 2013; Margison & Van der Wende, 2007; Rauhvargers 2011; Van der Wende, 2008) The deeper analysis of the rankings is not part of our research, but important lessons drawn have to be taken into account when determining the factors indicating an HE institution's performance. These efforts also highlight that a strong international and national tendency exists regarding the quantification, comparison, data collection and data-based decision-making processes.

Thanks to the ICT infrastructure development, the administrative management of HE students has been changed, too. Simultaneously, an increasing demand of a proper structuring and handling of information can be observed in many countries, therefore in the context of education, too. Many IT solutions were developed; it is clear that they were not meant to create the best possible operating state, but to connect the existing software systems. A great need arose to treat uniformly the sporadically recorded electronic data linked together and converted into a usable form. The established databases can provide an objective benchmark to local, regional and national decision-making processes. It is quite obvious that better results can be achieved with larger amounts of data, it is easier to identify the current trends, the main influencing factors, such as the future direction of the entire system can be estimated. Big Data method goes well beyond the traditional statistical tools, does not focus on showing the classic relationships, the 'why' rather the present situation 'what'. We have to point out this new direction as it has been possible the global man-

agement of data, so it is worth considering other ways of possible analysis, too. (Mayer-Schönberger & Cukier, 2014) The aggregate information source repository can be manifold:

- inputs of the HE application process,
- internal institutional data systems,
- government repositories: tax administration bodies, pension bodies, national statistical offices, ministries related to education,
- feedbacks from the labour-market entities.

The data-based decision making is no guarantee that the optimal decision is achieved, nevertheless generally are more efficient than those built on subjective judgments, as objective indicators interpreted in the same intervals – even if not in absolute terms, but – can give a relevant benchmark. A multiple approach, processing several factors can certainly reduce the possibility of error. (Dinya, 2010) Also, the data-driven decision-making in HE management can be found at the European level. The Europe 2020, a strategy for smart, sustainable and inclusive growth document (European Commission, 2010), contains as a main target the consolidation and effective governance realized within international cooperation framework of various HE systems.

On this basis, it is worth examining what solutions we can find about graduate career tracking systems in other countries, and which elements can successfully be applied to create a more efficient information-based decision-making in HE.

2. Graduate career tracking systems in the world

Substantial and significant differences can be observed in career tracking systems across the single countries, as they were created based upon a different history, financial background, survey method and policy embeddedness. The extensive career tracking system literature is very poor, typically a continental, multiple country bases can provide a starting point in this context. Also, Usher and Marcucci in their study attempt to establish some broad categories. In our analysis we will rely on their approach. However, new variables will be considered to create a new structuring. (Usher & Marcucci, 2011) The following factors will be taken into account:

- The main goal of the survey: institutional or governmental orientation (information for policy-making decisions or training development within HE), applied for com-

parison of institutions or accreditation purposes.

- The timing: it is important to determine the first period when to carry out the survey (before graduation, at the time of graduation, 6 months, 1 year after graduation etc.), how often it repeats on the same cohort (2, 3, 5 or 10 years later), or how often a new base population is established (annually, every five or eight years etc.)
- Method: how the base population is selected (total population, representative sample), what kind of student groups to survey (all types or only along some certain specifications), by what means to carry out the surveys (online, by phone, in person), incentives used if any (financial or non-financial).
- The use of information: public reports are prepared, treated as business secret or autonomously searchable databases are created. The list of potential application forms is quite large; it is determined by the stakeholders' attitude toward the research.
- Survey topics: selected topics vary based upon the purpose of the survey and the use of the data. They are the most frequent: institution evaluation, current studies, the transition to labour-market, job-related information, and socio-demographic background factors.
- Responsible organization for the survey: non-profit organizations, academic institutions, government authorities, or a combination thereof. The question is largely influenced by the common practice, legislation, and how it is seen to give student-related information to third parties.

The study framework does not allow a comprehensive description of all systems around the world; basically we will present cases which are primarily situated in non-Europe context. The European level graduate career tracking systems are more united, more elaborate and comprehensive by international researches (REFLEX, TRACKIT, CHEERS, HEGESCO EUROSTUDENT etc., for more details see Veroszta, 2011) and the EU is in the pursuit of supporting these initiatives. Obviously, a good best practice can be provided by EU countries, but we intend to disclose the elements of the GCTS systems of the countries outside Europe.

By following the principles described above, we applied a profound literature review and document analysis country by country. In several cases we had the possibility to create an overview of the GCTS practices only by the search of homepages communicating the survey results. After the relevant international academic journals and portals, we managed to discover more relevant information sources by the Google search engine. In addition to English language resources, our given more in-depth knowledge of Spanish helped to apply a different language search, too. The following expressions were used (in English and Spanish):

- Graduate Career Tracking;
- Graduate Destination Survey;
- Graduate Employment Survey;
- Graduate Follow-Up Survey;
- Graduate Follow-Up System;
- Graduate Survey;
- Graduate Tracer Studies;
- Graduate Tracking Survey;
- Graduate Tracking System;
- Tracer Studies.

Typically, at least ten hits pages were observed, and also as long as we felt that the results were still connected at any level to GCTS within the given country. We provide a summary table (Table1) about the GCTS practices of selected countries.

Table 1 Graduate Career Tracking System practices in the selected countries outside Europe, 2014-2016 (Part 1)

Continent	Country	Survey name	Responsible for survey	Survey type	Targeted population
North America	Canada	National Graduate Survey	Statistics Canada, Department of Human Resources and Skills Development	national	stratified sampling in 2 and 5 years after graduation
	United States of America	Baccalaureate and Beyond Longitudinal Survey	National Center for Education Statistics Higher education institutions	national, institutional	last-year students, representative sample cohorts in 1, 4 and 5 years after graduation
Australia	Australia	Graduate Destination Survey and Beyond Graduation Survey	Australian Association of Career Counsellors, Ministry for Education, Science and Training, Australian Vice-Chancellors' Committee	national	4th months, 3 and 5 years after graduation
		Course Experience Questionnaire		national	
Australia	New Zealand	1973-1996 unified, then 1997-2007 University Graduate Destinations	Standing Committee on Graduate Employment	national	6 months after graduation
		since 2011 Graduate Longitudinal Study New Zealand		national	2, 5 and 10 years after graduation
	Oceania	Graduate Destination and Programme Experience	Planning and Quality Office	national	5 months after graduation
Africa	South Africa	Labour Force Survey	Development Policy Research Unit	national	graduates between 1995-2005, 2000-2007
South America	23 countries	Universia	Universia	international	from 6th month until 2nd year after graduation
	Chile	Mifuturo	Ministerio de Educación	national	n. a.
	Colombia	Encuesta a Graduados	Observatorio Laboral para la Educación	national	at graduation
				national	1, 3 and 5 years after graduation
Near-East	United Arab Emirates		Zayed University Office of Graduate Students	national	exit survey and 1 year after graduation
Asia	Philippines	Knowledge Community	Commission on Higher Education	national, institutional	5 year periods
	Malaysia	National Graduate Tracer Study	Ministry of Education	national	final year students and within 4-6 months after graduation
	Singapore	Graduate Employment Survey	Ministry of Education	national	6 months after graduation

Table 1 Graduate Career Tracking System practices in the selected countries outside Europe, 2014-2016 (Part 2)

Continent	Country	Survey name	Frequency of new cohorts	Survey method	Average response rate	Other information
North America	Canada	National Graduate Survey	5 years	CATI	49%	
	United States of America	Baccalaureate and Beyond Longitudinal Survey	5-7 years	phone, internet, in person	representative sample	reward: 30-50$
Australia	Australia	Graduate Destination Survey and Beyond Graduation Survey	yearly	phone	60-65%	minimum response rate of 50%, it is the limit to publish data about the institution
		Course Experience Questionnaire	yearly	phone	60-65%	
Australia	New Zealand	1973-1996 unified, then 1997-2007 University Graduate Destinations	yearly	e-mail	34-38%	
		since 2011 Graduate Longitudinal Study New Zealand	n. a.	online	57%	
	Oceania	Graduate Destination and Programme Experience	yearly	post, online, and at graduation ceremonies	60-65%	reward: 100 Philippine peso voucher
Africa	South-Africa	Labour Force Survey	n. a.	n. a.	n. a.	
South America	23 countries	Universia	yearly	online	n. a.	complex services for HE institutions, foreigner students and for abroad studies
	Chile	MiFuturo	non-regular	institutional data	n. a.	homepage provides information about HE, after the labour market
	Colombia	Encuesta a Graduados	yearly	institutional data	n. a.	
			yearly	online	22%	
Near-East	United Arab Emirates		n. a.	online, phone, in person	n. a.	
Asia	Philippines	Knowledge Community	1993-1997, 1998-2002, 2006-2010	online	n. a.	
	Malaysia	National Graduate Tracer Study	yearly	online	100% exit	
	Singapore	Graduate Employment Survey	yearly	online	72%	

Source: The author

Based on our research, very diverse GCTS practices can be identified, there are top-down government-policy driven, top-down education-policy driven and traditional solutions based on loosely managed interactions between institutional researches. This classification fully covers the selected countries, but we have to deal with the existing data from a broader view to distinguish the model types from one to each other.

In most cases, the system is financed by the government (even if a non-profit organization plays the executive role), so it is evident that these interests appear more obviously in the surveys. The majority of surveys build on online tools, as it is the cheapest, quickest and easiest solution, but simultaneously is accompanied by lower response rates (Singapore is an exception, because of the extremely short survey). Those using phone or in person interview are much more expensive, but more than 50% response rates contribute to more reliable and statistically proved conclusions. In general, we can confirm, that longitudinal studies based on representative cohorts conclude in a more complex and long-term approach in order to handle the training and service development strategically. Further, it is an essential question how to incentive the response of GCTS surveys, as more and more requests will reach the possible respondents every day to participate in this or in that type of research. In most cases, we do not see a direct money flow, still a relative higher re-

sponse rate is achieved. On the one hand, this is mainly due to a good relationship with the former institution; the former students are willing to participate in the surveys, just to help them in this effort. On the other hand, the personal involvement also plays a significant role, that the graduates are pleased with the request for participation, that they finally can assess the educational institution. Thirdly, we see also good practices where direct money transfers are not offered to the respondents, some service package (e.g. integrated, searchable database) will be available as an added value instead.

In addition to the presentation of the several solutions of the selected countries along the predetermined factors, a complete questionnaire analysis was carried out within the framework of the manual data collection, which can help to understand the models better. (Table 2) Based on the available data we identified the 14 factors which occur most frequently, or in our opinion should appear in this type of surveys. Besides the socio-demographic background factor, 7 elements are related to the higher education, while 6 are linked to the word of labour. We firmly believe that these 14 factors completely cover the issues that could arise by the stakeholders. It is interesting to note that none of the surveys are likely to implement every one of them, a scarification; a trade-off is applied in most cases to reach the ultimate goal. These ultimate goals could be several: to make the survey easier or shorter to fill out, or simply a specific issue is not considered due to a political reason. It is important to consider whether the implemented system is built on a hierarchical or heterarchical decision system. The latter probably did not come to the fore, as the current mainstream in decision logic is considered to be linear, the implementation of a polycentric, mutually subordinated surveying system is difficult. We believe that it is worth to conduct a deeper and exploratory research in this area in the future.

Table 2 Graduate Career Tracking System topics in the selected countries outside Europe, 2014-2016

Country, survey	DEM	Evaluation of Higher Education							Labour-market position					
		ES	LS	AE	DU	HU	CR	CH	COM	EMS	GET	JQM	SA	JS
Australia Graduate Dest. Survey	✔	✔	–	–	–	–	–	✔	✔	✔	✔	–	✔	–
Canada National Graduate Survey	✔	–	✔	✔	✔	✔	–	✔	–	✔	✔	✔	✔	✔
Chile Mifuturo	✔	–	–	–	–	–	–	✔	–	✔	–	–	✔	–
Colombia Encuesta a Graduados	✔	✔	✔	✔	–	✔	–	✔	✔	✔	✔	–	✔	–
Malaysia National Grad Tr. Study	✔	✔	–	–	✔	–	–	✔	✔	✔	✔	–	✔	✔
New-Zealand Graduate Long. Study	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	–	✔	✔	–
Oceania Graduate Destination and Programme Experience Survey	–	✔	–	–	–	–	✔	✔	✔	✔	–	–	✔	–
Philippines Graduate Tracer Study	✔	✔	–	–	✔	–	–	✔	✔	✔	✔	✔	✔	–
Singapore Graduate Emp. Survey	–	–	–	–	–	–	–	–	✔	✔	–	✔	✔	–
South African Republic Pathways from U. to Work	✔	–	–	✔	✔	✔	–	✔	–	✔	–	–	✔	–
South America Universia	✔	✔	–	✔	–	–	–	✔	–	✔	–	✔	✔	–
United States of America B&B Longitudinal Study	✔	–	–	–	–	–	✔	✔	–	✔	–	–	–	–

Source: The author

Legend:

DEM: Socio-demographic background
ES: Education related satisfaction
LS: Language skills
AE: Abroad experience
DU: Degree usefulness
HU: Higher education usefulness
CR: Returns on higher education costs

CH: Current higher education program
COM: Competencies, skills, knowledge
EMS: Employment status
GET: Time between graduation and employment
QM: Job and qualification match
SA: Salaries
JS: Job satisfaction

The three major identified groups will be described below.

1. Surveys based on short-term tradition or a loose connection of institutional arrangements (United Arab Emirates, South African Republic, Philippines, Malaysia, Oceania, Singapore)

We classify in this type those countries, where the surveys are conducted at national level, but still, we cannot find a deeper embeddedness or long-term tradition or strategy related to it, or just the existing institutional surveys are not considered within an integrated framework. Typically, there are a couple of decades of practice, but at the level of policy-making there is a significant need for useful, quantifiable data, so the governmental bodies strongly influence the GCTS.

The countries belonging to this category are mainly developing ones with little or no information in English, but the general goal is to create a high quality and reputation of the higher education system at an international level. This requires having an appropriate monitoring and a quality assurance system which give feedback to successfully identify the areas that require attention. The surveyed topics are quite heterogeneous, not even the socio-demographic background is measured, and particular attention is on the current employment situation. Singapore stands out from the other countries, in the sense that only the labour-market position is surveyed. This is due to the fact that in recent years a strong pressure came from the public to actively increase employment among fresh graduates. The situation is quite similar in Malaysia, namely the main goal of the government is to reduce the high unemployment rate. In South African Republic a special demand arises by the side of the medical training accompanied with one of the most heterogeneous survey topics, not to mention the Philippines.

2. Countries with long-term GCTS traditions (United States of America, Canada, New Zealand)

The North American countries and New Zealand typically have several decades of graduate career tracking system history, with strong central financial tools, typically using representative samples and cohorts based surveys. The data are available on the website of the responsible organizations, and institutions receive data for further analysis.

The American countries have a long tradition in the field of data collection, so it was not difficult to reconcile the interests of the institutional and governmental levels. In the USA the assessment of higher education is quite neglected, rather a return on the HE investment and the current employment situation is in the focus of the surveys. The alumni system and the relation with former students is a major source of finance for the HE institution, therefore GCTS is treated as confidential, but the data showing how successful are the graduates are open-access and available for everyone. In Canada more topics are covered both in relation to higher education and to labor-market, but the New Zealand covers the broadest range of stakeholders' information need. In New Zealand the experiences regarding the transition to longitudinal surveys are now being tested, creating a cohorts-based GCTS.

3. Complex service-package offering systems (Australia, Chile, South-America, Colombia)

The countries in this category have a radically different GCTS form the previous ones. The feedback and presentation of the results are totally and organically connected to higher education stakeholders' needed information. A lot of information is needed to decide wisely when choosing among the available HE trainings. On the one hand, administrative questions arise (how and where to apply, the type and level of training); on the other hand, the possible conditions and related data for long-term career and work are in focus. This comprehensive approach allows the stakeholders to search autonomously among the data, and perform a multi-criteria search.

Thanks to the data collection an indirect recruitment or head-hunting activity can be offered which:

- is good for the graduates, as they can switch jobs more easily,
- is good for the employers, as it costs less to find the proper employee,
- is suitable for the survey responsible organizations, as a higher response rate can be achieved, and the graduates are interested in updating their data,
- is good for HE institutions, as not big administrative staff is needed to maintain the system at institutional level, which also means a cost-efficiency,
- is useful for the governments, as private companies can bear some of the costs and all the data can be collected.

We believe that this approach is the one that makes the graduate career tracking system sustainable and successful.

Summary

The higher education has undergone significant changes in recent graduates. Already it has to respond to the ever-accelerating environmental effects, HE institutions have to shift from the centuries of isolation 'ivory tower' to a 'lighthouse' and to redefine and rethink their role and mission. The performance, the quality, and the competitiveness conceptual frameworks have been fully placed on new basis with the forthcoming of globalization; the institutional rankings are not able to make an objective difference between

them. It can easily happen for a European HE institution to be a direct competitor of a Singapore's university, while 30 years ago this was unthinkable even at a theoretical level.

The HE changes and digitalization has also increased the demand for data-driven decision-making, and possibly a multi-criterion applicable integrated database search can contribute to better planning. For the higher education, one of the most useful information sources can be a uniform graduate career tracking system applied in an appropriate framework. It could seem simple and thinking it thoroughly it could be logical what to understand. However, there are many solutions based on the examination of the graduate career tracking system practices.

In this study we identified three different GCTS models based on a set of analyzing factors. The short-term tradition model fulfils specific needs; the long-term tradition model uses a systematic data collection, operating in predictable and stable frames; the complex service-package offering system reshapes the basis of the framework involving the graduates and rather considering them as consumers not as information sources to achieve a higher quality of services. SM

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