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Dialogues between Vocational Education and Training and Higher Education.

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This paper does not reflect the view of the Ministry of Education and Research in Romania

ABSTRACT

For the purposes of this piece, we take as accepted wisdom, first that higher education will continue expanding towards a mass system, and second that it will continue to move in the direction where individual adaptability and the progressive building of expertise are at a premium.

There are cited in reports of different national or international institutions economic considerations as major reasons for the state to support further expansions in higher education, and so presumably there is a public policy interest in maximising the economic impact of higher education. Some scholars may disagree with citation of only economic related arguments, but the reference does not mean these are the only ones or the most relevant ones.

The purpose of this paper is to contribute to the ongoing discussions on the subject of the Challenges of the Labour Market and the Work-Place on Higher Education Development from an outsider perspective coming from the area of the technical and vocational education and training (TVET), from where, one can suspect the labour market feature has been borrowed.

In order to facilitate the faster understanding of the opinion we formulate as reaction to the question launching the debates of the seminar: Vocational Content in Mass Higher Education? we propose to examine the potential dialogue topics of the apparently two different worlds: TVET and Higher Education.

We propose first some key words and succinct portrayal of challenges TVET is facing in our days and even more, on the tomorrow eve; secondly some potential
commonalities of TVET and Higher Education developments and trends, and thirdly, we are coming to the opinion that suggesting to analyse the potential vocational content of higher education, one could be mislead by the past meaning of the concept vocational, and so to repudiate its association to higher education. This is why, for the same purposes, we advocate using the concept professional instead of vocational when referring to the content of higher education in its relations to labour market. And fourthly, we propose some examples of professional content in higher education.

**INTRODUCTION**

We are not going to give details about the international or multinational context, higher education developments are placed. Our assumption is the readers of the paper are quite familiar with the UNESCO 1998 World Declaration on Higher Education and the Framework for Priority Action for Change and Development in Higher Education, the Bologna process and the subsequent “signpost” documents, the World Conference on Higher Education reports and recommendations, the European Higher Education Area related documents, just to name some of perhaps the most relevant ones, without claiming to have given an exhaustive list.

For the purposes of this piece, we take as accepted wisdom, first that higher education will continue expanding towards a mass system, and second that it will continue to move in the direction where individual adaptability and the progressive building of expertise are at a premium.

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concept **vocational**, and so to repudiate its association to higher education. This is why, for the same purposes, we advocate using the concept **professional** instead of **vocational** when referring to the content of higher education in its relations to labour market. And fourthly, we propose some examples of professional content in higher education.

**TVET AND THE NEW CHALLENGES**

What is Technical and vocational education and training? Which are the various layers of training included within the term TVET? What is the function/place of pre-vocational training? What is technical versus vocational education in upper secondary (the former usually leading to post secondary or higher vocational education, the latter leading to entering the labour market)? What is the nature and purpose of TVET in secondary education versus post secondary, and versus higher education and CVT?

As far as TVET is concerned, the European context is particularly defined by **The Declaration of the Ministries of Education and Training in Copenhagen**, from November 2002. The signatory states proposed strengthening the cooperation (within the process known as the Copenhagen process) at the European level in this field so that the following objectives to be accomplished:

**European Dimension**

- Strengthening the European dimension in vocational education and training with the aim of improving closer cooperation in order to facilitate and promote mobility and the development of inter-institutional cooperation, partnership and other transnational initiatives, all in order to raise the profile of the European education and training area in an international context so that Europe will be recognized as a world-wide reference for learners.

**Transparency, information and guidance**

- Increasing transparency in vocational education and training through the implementation and rationalization of information tools and networks, including the integration of existing instruments such as the European CV, certificate and diploma supplements, the Common European Framework of reference for languages and EUROPASS into one single framework.
- Strengthening policies, systems and practices that support information, guidance and counseling at all levels of education, training and employment, particularly on issues concerning access to vocational education and training, and the transferability and recognition of competences and qualifications, in order to support occupational and geographical mobility of citizens in Europe.

**Recognition of competences and qualifications**

- Investigating how transparency, comparability, transferability and recognition of competences and/or qualifications, between different countries and at different levels, could be promoted by developing reference levels, common
principles of certification, and common measures, including a credit transfer system for initial and continuing vocational education and training.

- Increasing support to the development of competences and qualifications at sectoral level, by reinforcing cooperation and co-ordination, especially involving the social partners.
- Developing a set of common principles regarding validation of non-formal and informal learning with the aim of ensuring greater compatibility between approaches in different countries and at different levels.

Quality assurance

- Promoting cooperation in quality assurance with particular focus on exchange of models and methods, as well as common criteria and principles for quality in vocational initial and continuing education and training.
- Giving attention to the learning needs of teachers and trainers within all forms of vocational initial and continuing education and training.

As mentioned by different documents or recorded by different reports, early identification of skills represents a priority due to the need to increase TVET responsiveness to the labour market demand. There are different approaches that have been adopted by countries, but the common one refers to the sectoral approach and to decentralised labour markets, mainly at regional level. In case of sector demand the tendency is to standardize the demand, a lot of countries having completed the processes.

Increasing transparency and mobility have been translated into curricular decisions trough modularization and credit transfer and accumulation schemes. Recognition of learning achievements in non-formal and informal contexts as well as prior learning and experience open the ways to enhanced mobility both, at occupational and geographical levels.

The recently adopted by the European Council “New integrated guidelines on growth and employment”, recommends education and training to foster their contribution to economic development and employment enhancement.

A common trend of the TVET qualifications in the knowledge based economy is the move towards “knowledge worker” which implies new and more complex skills to be acquired. The capacity to understand complex processes and to operate complicated equipments has consequences on the nature of knowledge and skills. More general skills, based on fundamentals of science and technology are needed which conducted to diminishing the differences between academic and vocational subjects. This is more relevant for the higher qualifications levels which are usually provided by upper secondary education and post-secondary non-university education levels.

Relevancy of TVET and its best fit to the purpose is under development in most European countries and a European Framework for quality assurance in VET has been agreed and now implemented on volunteer basis.
Specific indicators have been developed which makes TVET comparable in between countries and in between institutions within a country. Competitiveness and competition will bring improvement in favour of better professional and social insertion of graduates, increased participation in TVET within a lifelong learning perspective due to the trust of both trainees and social partners.

**TVET and HE – looking for commonalities**

First some words about Higher Education and mass Higher Education in order to share our concerns and perception of the areas under debate.

Does mass Higher Education refer to all cycles of Higher Education as agreed by the Bologna signatory countries?

Given the assumption about expanding higher education that we have made, there is a very reason to believe that its interaction with the labour market will become more, rather than less important. This is because higher education will interact with a broader group not only of students but also of occupations. Many of these occupations have been in the past accustomed to interacting with schools and other vocational training providers (sometimes through apprenticeship); with some and possibly an important proportion of those graduates now experiencing higher education, these occupations are bound to look to higher education institutions to replicate the relationships they had with the world of education at earlier stages. The competition with non-university organizations is already a reality. The partnership perspective is also vital.

**TVET and HE – a systemic approach in a lifelong learning perspective**

TVET and Higher Education could be mentioned together if accepted they are part of one education and training system. But, it seems that in many countries we meet a disjointed education system, characterized by absence or misalignment of key system components: standards, learning outcomes, curriculum, assessment, teacher quality, accountability. Improvement requires collaborative leadership (business, education, policy).

If Higher Education and business are those creating knowledge, transferring and diffusing knowledge, why not asking HE accountability for TVET outcomes?

Looking in depth to higher education, and in particular due to the Bologna challenges, we suggest exploring the study programme stratification. This lies in attributing and distributing academic study objectives and subsequent development of skills to the two, or three, tier system in an adequate manner. It may be said that there is an issue of contributing elements to a qualification framework.

A Qualifications Framework as lecturing grid is looking for all types of qualifications, irrespective the provider type or the learner age. A comprehensive restructuring of the European landscape of higher education is underway, and qualifications themselves are becoming the focus of more attention as their meaning and relevance are being considered in relation to the realities of the 21st century. Part of this
process is a pronounced tendency to create more explicit systems that map and explain the purpose and relationship between different qualifications. In the meantime, a European Qualifications Framework is under consultation right now and has the purpose to make transparent and visible, in the sense of readable, qualifications at all levels, supporting the lifelong learning.

The question of lifelong learning – which is of great importance due both to the acceleration of knowledge required and to the tendency towards part-of-lifetime employment and extended worklife – comes in as well as the existence of trainee programmes and training on the job schemes, which may at least in part be organised as academic study programmes in conjunction and cooperation with employers. Furthermore, the call for differentiation of expertise calls for flexibility of study structures to be created by more interfaces within study programmes and making provisions for crossover opportunities. Indeed this is the key idea behind the concept of modularization and of the three-tier system, or even multiple-tier system when integrating lifelong learning schemes.

Learning attractiveness for individuals call for their prior learning achievement recognition, and the modularised, competency based study programmes is representing one of the possible approaches to encourage participation and thus, lifelong learning. Associated credits schemes to the modular study programmes are just solutions for confirmation of learning achievements both for the vertical and horizontal mobility. Additionally, credits could serve to make the multiplicity of entrances and exits operational being based on clearly defined interfaces, and to build bridges between qualifications and practical experience alike, be the latter being achieved through internships or previous informal or formal yet non-university and non-polytechnic learning experiences.

In saying that we would like to exemplify the previous not yet non-university experiences as being achieved through TVET and to call the attention on the need for articulation of TVET and HE, within a systemic approach, based on the qualifications framework provision.

This is one of the ways higher education can shape its function in the move towards a society of lifelong learning. While politicians and higher education representatives agree on the need to provide lifelong learning, many higher education institutions – and in particular traditional universities – are reluctant to going beyond the lip-service they are paying and to develop concrete activities. While they agree that lifelong learning is important in the overall development of education and training, they hesitate to accept a central role for higher education in it.

The approach to lifelong learning should not be reduced to education institutions involvement in providing services to working adults seeking continuing professional development, even if this service is probably the most concrete form of such contribution. The culture of lifelong learning must start much earlier in the context of a comprehensive educational strategy of knowledge transmission, the important component of which has to be the development of the capacity and of willingness to learn permanently. If higher education is concentrating on this approach which
includes teacher education as well, the benefits will multiply as the effect will be recorded (the positive attitude versus learning) for youngsters before entering higher education.

**TVET and HE - a sector approach**

Discussing about TVET and the sector perspective is at ease. Trying to apply the pattern to higher education, first we need to acknowledge that there is dispute about whether education in general and higher education in particular should – as a matter of policy – attempt at all to engage with labour market. Some have questioned the morality of this. There are real arguments either for defining the education only as expression of individuality or for questioning whether education of itself can provide much by way of meaningful preparation for work, experience of "real world" being considered as being all that really matters.

We have to live in between the two attitudes, and maybe, the truth should be found there.

Skill development is regarded as a second-order activity by HE/ academics who are more concerned with broadening and deepening their subject knowledge and understanding.

But in the knowledge economy where exactly is the frontier between knowledge and skills? How did the skills nature change and which are the trends in this respect? As analyses of employer needs and graduate attributes, carried out in different countries, have become more sophisticated, there has been a refinement in thinking about skills.

TVET and HE (at least the segments accepting they are leading to skills creation) could be mentioned together, as part of a sector stakeholders group, if accepted they are addressing the following common goals:

- Reducing skills gaps and shortages
- Improving productivity, business and public service performance
- Increasing opportunities to boost the skills and productivity of everyone in the sector's workforce, including actions on equal opportunities
- Improving learning supply

The sector approach, at least in case of higher education, draws the attention on the stakeholders’ target groups needed to be involved. The relation to occupations - in some countries to trades - is changing, in our opinion when moving to higher qualification levels, from occupations to professions. Therefore, we suggest professional bodies' participation to partnership structures created either by universities or specialised qualification boards to be fostered.
TVET and HE contribution to the regional development

Reactive and more and more proactive TVET is designed to play contributions to regional development. The University is considered as a tool for regional development. Its regional presence is actively sought by political decision-makers and socio-economic operators. Whilst universities have always contributed to the social and cultural development of places in which they are located through a sense of civic responsibility, the merging regional development agenda requires regional engagement to be formally recognised as a “third role”. Within the university the challenge is to link the teaching, research and community service roles by internal mechanisms and within the region to engage the university with all facets of the development process (e.g. skills enhancement, technological development and innovation, cultural awareness) in a region/university “value added management” process within the “learning region”.

There are discussions related to the regional development and the territorial dimension to higher education policy. Territoriality is an extremely complex and problematic concept for higher education institutions, which by their mission or within their institutional plans embrace some notion of territoriality that ranges from contributing to “society” and international research to more precise commitments to local and regional communities. Introducing a regional agenda within the national system is likely to require a stronger regional planning framework which brings together a number of regional stakeholders to co-manage, co-ordinate and regulate the management and funding of teaching and research. Such mechanisms may pose a challenge to institutional autonomy.

Higher education institutions, then, operate within multiple and overlapping territories and usually manage a portfolio of activities ranging from the global to local. The advantage of a university presence in a region is that expertise can be a major asset to the community.

The challenge of regional development on higher education remains the relevancy of the education supply. Does a university educate only for a region within the context of globalization and internationalization? Maybe not, but its contribution to regional development is an important aim. Historically, universities have played a key role in nation building and continue to do it. A key challenge is to enhance the role which universities play, through their staff and students, in the development of networks of trust and civic engagement and hence in the wider political and cultural leadership of their localities. Higher education institutions can play an important brokerage role within regions in terms of promoting debate on the suitability of different models of regional development and their ability to meet the needs of the regional population. The demand to create more regionally relevant education systems is noted in a lot of countries conducting, *inter alia* to graduate retention of people with innovative, entrepreneurial and management capabilities.
**Employability**

For the purpose of analysis definition of terminology is essential. So, what is meant by “employability” in a general sense, what is linked to, and how could TVET and HE support its achievement. The employability idea is much commented on in the recent literature and policy discourse.

What is next in the career life of a higher education graduate? Most of them look for a job if not got it during the studies. A similar judgement could be applied to TVET graduates. Self employment is part of the employment understanding. From the viewpoint of society, an employable person is the one being able to fulfil a task which is meaningful enough for society or at least one of its members to be willing to pay for it. The individual’s viewpoint gives to employability the meaning of being able to earn one’s living by one’s own work. Hence employability means business, value for money, and depends on more or less rational choices of those who dispose of money. That is why employability means competitiveness.

Although this could be right, employability should not be perceived as the end of education, but a competency of the skilled authentic social agent. Employability is about making closer links between education and the world of work. But, employability is, at heart, about a process of learning, not least, learning how to learn.

TVET and employability are easily accepted together. What is the employability related to could also be questioned in case of TVET. We tried mentioning the challenges in a very synthetic manner. But, the identification of possible identities between elements of “employability” and of “good academia” still continues in case of higher education.

Some schools of thought relate employability to general employability skills. The idea of general employability skills, named frequently transferable or key skills, has featured strongly in the policy discourse of the past decade. It offers much intuitive attraction; the essential ideas are not hard to grasp and are easy to build an “agenda” around. Large and prestigious companies can be found to subscribe enthusiastically and in an articulate manner to the more advanced concepts of problem solving, autonomous functioning and learning to learn. Moreover, the precepts of general employability skills often coincide with good teaching and course design. On the other hand, there must be some doubts as to how far this kind of approach can be pressed. There are certainly problems in operating some key skills concepts for the purposes of teaching and, particularly assessment. Additionally, we have to notice there are not many, if any, complete and convincing accounts of the nature and contribution to employability of key skills. This, of course, is not to say key skills may not serve a function to foster successful entry to the labour market, but is simply to ask for caution when mentioning only key skills as the employment predictor.

There is also a tendency to measure employability in terms of whether the graduate obtains a job of a specific type within a given period after graduating. This becomes irrelevant as an indicator of the employability of those already in work. Therefore, we
would like to underline the employability development is a process in itself. An important proportion of education institutions have been focusing it on the following actions:

- Development of employability attributes;
- Development of self-promotional and career management skills;
- Willingness to learn and reflect on learning.

What is the role of education institutions in the employability development process?

We should mention that the employability development activity organised by education institutions is measured through the employment rate of graduates which represents a crude performance indicator. So, the employment rate of graduates from an institution is not an employability measure. There is a more sophisticated understanding of the factors that impinge on employability and its relation to widening participation and employer recruitment. The latter calls for close relations of education institutions with the world of work!

In case of universities, they have to cope with the dichotomy of academic educational goals and the future employers’ wishes for usability on the job. Taking for granted the proposition that higher education should, where ever possible, perform the function of preparing at least some of its graduates for employment, we confine the discussion in this paper to some aspects related to the questions as to how and to what extent that can be done.

The diverse range of employability-enhancing activities within education institutions can be categorised as follows:

- Enhanced support (usually via career services) for undergraduates and graduates in their search for work;
- Embedded attribute development within the programme of study, often as the result of modifications to curricula to make attribute development explicit or to accommodate employer inputs;
- Innovative provision of work based learning/work experience opportunities within, or external to, programmes of study;
- Enabled reflection on and recording of experience, attribute development and achievement, alongside academic abilities, increasingly by using progress files.

The tendency is the education institutions to develop clear strategy linking the wide range of employability projects. There is a lot of information on both TVET and HE institutions initiatives and activities, but relatively little analysis of the impact of employability development, in particular, in universities.

Other critical point which may be important to be mentioned is the readiness of the teaching staff to deal with the new “employability oriented” study programmes. If one can agree employability could be associated with “transferable skills”, the immediate question is, do teaching staff have sufficient transferable skills? Are they
ready to achieve and practice them since there is a necessity of thinking in a
discourse that is strikingly different from their own discipline?
And even more, if we are going to agree that employability calls for partnerships
which aims at study programmes elaborated in partnership with the world of work
representatives, so the price that universities will pay, may be less autonomy in
curriculum design and an on-going need to abide by extraneous quality assurance.
Is it realistic to expect immediate organizational support at university level under
these circumstances? Or should we presume the changes will start from smaller
structures as departments or faculties?
We will continue to explore the impact on and of the employability from other
perspectives: (i) the Europeanisation of TVET and the internationalisation of higher
education, and (ii) the diversification of TVET and HE modes of delivery, e.g.
distance education.

Since internationalisation of higher education involves at least cross-border learning
and cross-border provision, one can question the impact on employability which has
different understandings, given the wide range of academic cultures.
Internationalisation could take into account mutually-agreed curricula or may focus
on mutual recognition of qualification to enable the mobility of labour across borders,
the latter being fully preoccupied with employability. The aspect mentioned also in
the paper section TVET and HE contribution to the regional development
refers, in the internationalisation context, to the influences of multi-national
corporations versus the national employers in deciding the nature of skills,
employability related ones being included.

Traditional distance education – which has only been offered by a minority of
institutions – is undergoing dramatic changes as virtual and corporate institutions are
attracting an ever growing percentage of students, particularly among mature age
group that is already employed. The delocalisation of the education provider is
questioning the type of partnership these institutions could achieve with the world of
work representatives. What is to be questioned too, is also the relevancy to the
labour market of the competences to be learned, namely when trying to find which
exactly is the labour market that will recruit these graduates. One could be sceptical,
but considering the ICT experience there are not remaining too many answered
questions.

VOCATIONAL CONTENT IN MASS HIGHER EDUCATION – AN OPINION

Professional content instead of vocational content

All the above mentioned aspects add maybe new confusion in defining the scene, but
the purpose of listing as many queries is to underline the changing nature of
concepts we are accustomed to use. This is why we suggest discussing about
professional instead of vocational content.
The major reasons consist in the changing environment for both TVET and HE which make vocational meaning almost inappropriate. We already noticed substantial divergence as regards the occupational fields which are considered “professional” in various countries.

There is maybe a need to reconceptualise the academic/professional divide. Serious concern, however, is raised by the attempt or misunderstanding - unfortunately a frequent one with dire influences in identifying the right programmatic consequences – to dissociate “practice” from “theory” in the context of higher education study programmes. This attempt or misunderstanding may lie behind the frequently used distinction between “academic” and “professional” programmes. While not embarking on linguistic considerations of the understanding of “professional” in English, which is closely linked to “academic profession” such as medicine, law, accountancy and not to “vocation”, “trade” or “practice” as such, the concept is basically flawed when seen as opposites. Taking up a positive interpretation of “academic” versus “professional”, those advocating this distinction probably try to characterize elements of a binary system, which in essence, is independent of the structure of a given higher education system. We favour to describe the essential difference more succinctly by labeling the programmes as geared towards “research-based practice” and “research-driven practice”. In both terms, the word “practice” may be also replaced by “employability”, and “research” by “academic”.

**Professional relevancy of education and training**

Continuing to suggest terms replacement and to some extent the reconceptualisation, we would suggest to treat relevancy, as expected from TVET and higher education, for the latter in terms of “professional relevancy” instead of, for example, employability.

Relevance is a crucial issue in higher education as well as in other education sectors. For factors affecting relevance, higher education institutions should not only be responsive to societal needs and changes, it should also be proactive and leading the society. In developing countries which are striving to keep up with the world and are bombarded with different ideas, facts and values, higher education institutions have been seen to serve as neutral, non-partisan and rational voice of society based on evidences. It can clear some confusion and conflicts.

Another fact is the diversity of societal needs. Countries and communities are in different stages of development. They are, therefore, facing different problems. Relevance must be adjusted to the local setting. The required human resource and knowledge must vary. For instance, in industrial development, productivity and competitiveness may be most relevant. Universities must respond by innovations and creativity.

In line with the above mentioned, professional relevancy should be coordinated with the country specific needs of social and economic development in order to secure the contribution of higher education to societal needs.
Innovative approaches to content in higher education

We will limit our contribution to the professional content as being the topic of this paper. The factors calling for rapid and in-depth change and innovation in content, out of which some have been already mentioned, are numerous and very diverse. Advances in ICT are a major driving force. So does the evolving nature of societal needs to which higher education should respond. The relevance of the knowledge, competences and skills acquired does not always match the realities of the world of work.

It can be stated however that the ivory tower image of higher education institutions where things change slowly, is increasingly an image of the past. Of course, reform and innovation are not smooth processes. There is resistance to change, justified sometimes in terms of defending traditional academic values, but mostly reflecting inertia and adherence to old practices.

It is important to stress that, when faced with difficulties of this kind, institutions cope better with them when they strike partnerships – academic, but also economic and entrepreneurial – at local, regional, national, multinational and international levels.

Curriculum reform is looking for increased effectiveness both in terms of content and pedagogy. Curricula are increasingly focusing on learning outcomes, defined in terms of acquired competences and skills, rather than on the passive storage of knowledge, data and facts. Modularisation of the curricula structure and the use of credit systems is favouring mobility and learning attractiveness. Updating curriculum is one of the priorities since technological advancement renders it obsolete very rapidly. Assessment and certification should follow the same approach, meaning to be learning outcomes focused.

The changing world of work - In a climate of technological and organisational change characterised by downsizing, delayering and outsourcing, graduates cannot expect either a job for life or linear career progression.

Graduate attributes - Many research studies have revealed a consistent core set of desirable skills, often independent of degree subject, and a periphery of organisation-specific requirements. Some employers have gone beyond compiling lists of desirable attributes, to examining how these attributes enable graduates to be effective at work, how well equipped they are to learn and continue learning.

What could someone name as being professional oriented content in higher education? What kind of knowledge, competences and skills higher education is looking for?
Some examples include the following:

1. We discussed previously about **general employability skills** and related aspects that have to be considered;

2. Classification of competences and skills varies in the literature, but additional to what we named general employability skills or transferable skills, we would like to emphasize on the **entrepreneurial skills**;

3. As far as specific or specialized occupational skills are concerned we rather prefer to be cautious on naming the skills or recommending a methodology to prognosticate them on medium and long term. This is why we suggest measuring what is measurable and accepting labour market intelligence short term results. If agreed, we advocate in favour of facilitating learning of **general skills** – science and technology fundamentals – as foundation for later learning of the specialized skills. By later we understand either last part of the study programme (combined with work based learning/work experience in real work settings and applied research) and during continuing training or just during the continuing training for those graduating bachelor degree. The “professional master”, as introduced by some countries, offers by its aim the possibility to focus on the achievement of a profession related qualification.

**Partnership** with the world of work is crucial, and we would like to add the **networking** development which includes cooperation with other higher education institutions, the cooperation with TVET institutions too. Supporting articulation arrangements across the school, TVET and higher education sectors will conduct to optimization of education supply and increased learning attractiveness.

**Higher education institutions**

Adapting the structure of the universities to the realities of the 21st century requires strong governance and may be a new conception of the academic community. Two issues dominate the scene:

1. introduce “new managerialism” (Braun and Merrien, 1999) in the management of the university system

2. establish clear rules for the interface with the economic and social world.

In the meantime higher education institutions are expected to be more entrepreneurial, thus contributing to economic and cultural development. Academics and higher education graduates are invited to act as “Intellectual entrepreneurs”, while their institutions are closely related to various corporations for facilitating the transfer of knowledge and technology or for carrying out practice-oriented research. (Kwiatowsky and Sadlack, 2003).
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