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Editorial note

„European Studies on Inequalities and Social Cohesion” has been established in the year 2005. The idea was to create a forum for dissemination of results of the research project PROFIT (Policy Responses Overcoming Factors in the Intergenerational Transmission of Inequalities) funded by the European Commission under the 6th Framework Programme. The project was realized by the international consortium lead by the Institute of Sociology, University of Lodz. Journal Board and Editorial Board are constituted by the scholars from nine countries and twelve universities who took part in this successful research project. Since the beginning, we were publishing four volumes a year containing outcomes of the study in national and comparative articles, up to the termination of the project in the year 2007.

The current volume, as well as two forthcoming ones, will provide an opportunity to present the results of other research attempts undertaken by the scholars from the Institute of Sociology, University of Lodz in collaboration with partners from various universities and various countries.

However, we do not plan to limit the scope of the journal in any other way than via taking care of the quality of the articles and their relevance to the general subject area. We are open to any proposals from the academic community which will meet the guidelines for the authors. We hope to retain the international character of the journal and work hard in order to receive positive acclamation from an academic community.

We are pleased to invite potential contributors to read the rules regarding submission of the articles and not to hesitate to provide us with outcomes of their academic work.

Agnieszka Dziedziczak-Foltyn

Sociology of Education Department,

Institute of Sociology, University of Łódź, Łódź, Polska

Introduction

The current volume of the „European Studies on Inequalities and Social Cohesion” (1/2009) consists of the texts of authors who were the participants of the project „New Social Risks in the European Knowledge Society and Higher Education” (NESOR), conducted in the years 2006–2009 under the Socrates programme. The authors of this volume represent the following institutions: University of Lodz (Poland), University of Modena and Reggio Emilia (Italy), University of Barcelona (Spain) and University of Nijmegen (Holland). Scientists from the Academy of Science (Hungary) and Navreme (Austria) also participated in the project.

The papers cover detailed studies on higher education system in the context of the Lisbon Strategy, the Bologna Process, also the European Social Model. Social equality postulated in the European Social Model means that higher education should promote social equality and should protect against new social inequalities resulting from the development of knowledge based society. Focusing on the main challenges of the Lisbon Strategy, the Bologna Process and the European Social Model requires to define the role of higher education appropriate for the new forms of social exclusion and create the opportunity to co-design a long term strategy concerning the future of higher education in Europe and social cohesion of the European Union.

Texts published in this volume concern the central concept in the political strategies of the European Union (Lisbon Strategy), i.e. the knowledge society. Four articles review the debate of the knowledge society, new social risks and universities in four countries: Poland, Italy, Spain and Holland. Authors of each text describe the concept of the knowledge based society, focusing on different areas of the new type of society and locating it in different contexts. In Poland, due to a relatively limited progress in building knowledge-based society, this

concept is connected with the socio-economic development of the country. In Italy, the notion of knowledge society is viewed first of all in the context of the labour market. In Spain, the discussion about the new type of society is dominated by the technology paradigm of the information society concept. In Holland, the debate of the knowledge society focuses on the problem of the transfer of scientific knowledge to practice (innovation paradox) and mobilizing talents in Dutch society. Generally all authors agree that the systems of higher education must respond to new challenges including new social risks of exclusion in knowledge society.

Anna Buchner-Jeziorska

Sociology of Education Department,
Institute of Sociology, University of Łódź, Łódź, Polska

Globalised Knowledge-based Society and New Social Risks and Universities. The Polish Case

SHORT DESCRIPTION

The paper presents the problem of the „knowledge society, analyzing it on the basis of the relevant Polish literature, public discourse, and interviews with participants of the focus group and government projects, such as the National Development Strategy 2007–2015, the National Reform Program 2005–2008 and other sources. The conducted analyses lead to the conclusion that, in scientific discourse, the problem of the knowledge society is treated as a marginal issue. The category of the „knowledge society” has not got an explicit definition. Scientific literature uses synonymous terms, such as: „knowledge-based economy”, „new economy” „information society” and, less often, „learning society” or „web society”. The terms „information society” and „knowledge-based economy” seem to have become the most deeply rooted in scientific discourse. A similar diversity of opinions can be found in approaches to research. The relevant literature mentions four such approaches: historical, dynamic, evolutionary and institutional. The category of the knowledge-based society and economy is mentioned in official documents laying down the development strategy of Poland, drawn up on the basis of the Lisbon Strategy and the key BU documents that set out the development strategies for the entire Community. However, it is weakly rooted in the consciousness of the key social actors (stakeholders), both at national and local level. Therefore, it is anticipated that the further socio-economic development of Poland may be significantly jeopardized. One of the conclusions presented in the article is that Poland, in comparison with other countries of the EU, has achieved a relatively by low level in building the knowledge-based society, as measured by both specific and overall indicators that characterise the knowledge society.

1. Knowledge Society in Scientific Discourse

1.1. Essential Theoretical Approaches in Polish Subject Literature

One can find different approaches to the genesis of the knowledge society in Polish scientific literature. Having read texts on the knowledge society, one can distinguish the following four approaches; historical, dynamic, evolutionary and institutional. They describe the emergence of the knowledge society from different points of view. The first of these approaches emphasizes that although „knowledge society” is a new notional category, as a socio-economic phenomenon, it is rooted in the past. Its origin should be looked for as far back as in Ancient Greece (Witek 2006). In fact, the knowledge-based society is a society based on the ascetic ideals of Socrates and Platon, adopted by Christianity a few centuries after their death. This perception rejects the technocratic vision of the knowledge society, according to which the primary aim of the knowledge society is to achieve „... global dominance by building a competitive economy in which the intellectual capital would be recognized as the most important factor” (Witek 2006: 96). This concept is concerned with a society based on art and religion in which „the process of degeneration of a specific human being to the level of a one-dimensional creature, similar to all other representatives of the species”, would be halted (Witek 2006: 101). Placing an emphasis on tradition as a mechanism of handing down the cultural heritage is intended to give the knowledge society an axiological dimension.

The dynamic approach, on the other hand, points to the depth and speed of changes taking place in a post-modern society. The suddenness of changes occurring in different spheres of social and economic life makes it more and more difficult to manage these spheres. Effective management is in turn associated with an improvement of suitable practices which require knowledge and information. „The interest of economists, sociologists, psychologists, information technologists and representatives of other scientific disciplines in the problems of knowledge-based economy was a reaction to the suddenness, radicalism, speed and scope of changes taking place in economy, science and technology in the last quarter of the century, and to an increase in their mutual correlations ...” (Kukliński 2003: 6). Another researcher expresses a similar opinion: „We are experiencing transformations on a global, regional and local scale which are shaping a new type of a society based on knowledge and information. In such a society, investment in education becomes the main factor of economic growth and social progress” (Solarczyk-Ambrozik 2003).

The third approach points to the evolutionary character of changes taking place both in economy and in other areas of social life. Such an approach can be

seen in publications of A. Kukliński, who argues that not only economy goes through certain development stages in which knowledge begins to play an increasingly important role. „For 150 years, coal-based economy was dominant on Polish land. This model became fixed not only in material structures, but also in many layers of consciousness of the society and political, economic and scientific elites. At the beginning of the 21st century, it is necessary to initiate deep processes of changing material structures and social consciousness in order to achieve a decisive transition from coal-based economy to knowledge-based economy” (Kukliński 2003: 4). In the past, land, workforce and capital were factors of economic growth. Gradually, economic growth became increasingly dependent on organizational knowledge (*know-how*) and educated workforce. Finally, these last two elements merged into one fundamental factor – knowledge. Civilizational progress was needed to lead to the current structure of the workforce, resulting in an increase in the number of white-collar workers and a decrease in the number of people working physically. Not muscles, but knowledge is becoming a fundamental causative factor of development.

The institutional approach refers to the Lisbon Strategy, describing it as the main cause of interest in the problems of the knowledge society and economic development based on the use of knowledge factors. The United States are leading in the development of knowledge-based economy, whereas the European Union has been lagging behind the USA for many years. The Lisbon Strategy was developed to narrow this gap. According to its authors, it is intended to force European countries to take practical steps leading to the knowledge society. In 2000, the European Council adopted a 10-year Lisbon Strategy, which aims to transform the EU, by 2010, into the most dynamic and competitive knowledge-based economy in the world. The following strategic aim was then set before the European Union: to become, in ten years' time, the most competitive and dynamic knowledge-based economy in the world. According to the Strategy, R&D activities are one of the most important sources of innovation, while innovation has a fundamental effect on productivity. This in turn has a decisive impact on the differences between income *per capita* and economic development in particular countries. At the Göteborg Summit in 2001, the aim of implementing the Strategy was set out in detail: by 2010, to increase expenditure on research and development to the level of 3% of GDP, 2/3 of which should be financed by the private sector. To this end, the Member States of the EU are to increase their spending on research and development (R&D) to the above-mentioned level of 3% of the gross domestic product (GDP). Researchers referring to the institutional factors base their argumentation on the fact that European countries have lower rates of economic growth and social development than the United States. As the main argument, they use statistical data on education, innovation, information infrastructure and the development of

modern technologies. Similar arguments are put forward in relation to post-socialist countries which acceded to the EU and are lagging behind the 'old' Member States of the EU.

1.2. The Origin of the Concept of Knowledge Society in Poland

It is difficult to say precisely when this term first appeared in Polish scientific thought. It seems that this concept was most probably borrowed from classic writings of authors such as David Bell, Peter Drucker, Alvin Toffler and others. This assumption is based on the number of quotations and references to these authors in numerous sources.

What does the term „knowledge society” mean?” It is not easy to answer this question. There is not only one definition of the knowledge society. Most definitions are descriptive and incorporate many designations attributable to the knowledge society. The criterion for including certain designations in the set of attributes of the knowledge society has not been clearly defined; the criteria are based on intuitive assumptions. Definitions of this type treat the knowledge society as a social model, characterized by a growing significance of science and social capital. It can be seen in the following example: „The knowledge society is a society that identifies, produces, transforms, disseminates and uses information in order to build and use knowledge for the development of mankind. Such society incorporates a vision of pluralism, cohesion, solidarity and participation” (Zachorowska-Mazurkiewicz 2007: 4). The latter are used as indicators of the development of the knowledge society.

A new element appears in definitions which can be classified as genetic definitions. They place an emphasis on the emergence of the knowledge society from earlier organizational forms, i.e. from the industrial society. This transition from the industrial society to the knowledge society is characterized by: dematerialization (i.e. transformation of a part of material economy into processing of information), acceleration (i.e. reducing the time needed to produce a new product), decentralization (i.e. for example, manufacturing products on order, which was impossible in centralized economy) and globalization (Szafran 2002). The civilizational breakthrough that societies are just experiencing is caused by „... an increasing role of science and education [...]; the basic resource of the post-industrial period, the era of the learning society, is knowledge, which has a significant impact on the quality of social capital” (Solarczyk-Ambrozik 2003). The above approach corresponds with the following one: „In sociology, the knowledge society is understood as such a type of society in which knowledge and knowledge-related skills constitute the fundamental element of the social capital of an individual and of modernisation

resources of a society” (Kochanowski 2006: 84). There are two basic consequences of such an approach: firstly, the modernisation success of a society is understood, in a broad sense, as a success associated with investment in knowledge and science. Secondly, the success of an individual in competitive free market economy is strongly dependent on investment in his or her own education. Summing up, we can assume that the knowledge society is a society in which knowledge constitutes a fundamental factor of civilizational development. At the same time, it is an essential determinant of personal development and individual fulfilment.

Apart from „knowledge society”, there are other commonly used expressions, especially the two with a similar semantic range – „information society” and „knowledge-based economy”. Both these terms can be replaced with the term „knowledge-based society” or, even more shortly, „knowledge society” (Kleiber 2006). The author of this synthesis adds: „my facetious definition of the knowledge society is as follows: it is a society that today is preparing the conditions so that tomorrow it can create innovative products and services which were not even thought of yesterday, and many of these products and services may prove to be completely useless as soon as the day after tomorrow. This definition is intended to illustrate the dramatic circumstances of taking strategic decisions on development. Such decisions are made in conditions of great uncertainty as to their ultimate result, caused by ruthless competitive need of investment in the knowledge-based social creativity, which does not guarantee the success of every initiative, but as a strategy, it is nonetheless the best guarantee of sustainable development” (Kleiber 2006).

Conclusions

Different terms are used in descriptions of the knowledge society in the subject literature. It is difficult to say precisely which type of the concept prevails in scientific and political debate. It seems that a variety of terms are used to refer to the knowledge society. Terms such as: „knowledge-based economy”, „new economy”, „information society” are usually used as mutually interchangeable synonyms. There are also less frequently used terms, e.g. „learning society” or „Web society”. The knowledge society, knowledge-based economy and information society are most often described from a technocratic perspective (Pawłowska 1999, Haber 2003, Makulski 2006). Some authors attempt to explain the above-mentioned terms holistically, encompassing their technological, economic and social aspects (Olechnicka-Gorzelać 2007). As follows from the analysis of the relevant literature, the concepts of „information society” and „knowledge-based economy” are more popular and more deeply

rooted in Poland (as measured by the number of publications) than the other concepts.

The above analysis reveals that, first, there are different theoretical approaches in the relevant Polish literature. Secondly, these issues are not very popular and are rarely discussed by recognized authorities on the subject (experts in sociology, economy or politics). Overall, they constitute a marginal problem in scientific discourse.

1.3. The Knowledge Society in Public Discourse

Issues associated with the knowledge society are virtually non-existent in public discourse in Poland. For the last two years, these problems have been excluded from public discussions (in scientific communities) or political ones (conducted in Parliament or by politicians). Poland's contribution to the attainment of the Lisbon Strategy objectives is an equally infrequent topic in public debate (and it is more often taken up by journalists than by politicians).

1.4. Knowledge Society: a Chance or a Threat for the Socio-Economic Development of Poland

The question of whether and to what extent the creation of the knowledge society is a chance or a threat for Poland's socio-economic development is seldom asked in the few debates on the knowledge society, whereas discussions on the country's participation in the pursuit of the Lisbon Strategy concentrate on the advantages of Poland's membership in the EU resulting from the availability of resources from structural funds and the implementation of operational programmes („human capital, innovative economy, infrastructure and environment, technical assistance, etc.). In this context, the use of EU funds is perceived as a chance to overcome the socio-economic backwardness of Poland (including: high unemployment, low innovativeness of the economy, low mobility of the workforce, large number of different excluded groups, etc.).

In connection with the above, the concept of the knowledge society (a concept which is not well established in the social consciousness) does not entail any new social risks, because these social risks already exist, posing a threat (barrier) for further socioeconomic development of Poland. The country's involvement in the implementation of the Lisbon Strategy (understood rather pragmatically as the possibility of using EU funds) offers a chance to reduce barriers to the socio-economic development (including barriers that impede the competitiveness and innovativeness of the Polish economy).

2. Strategies for the Socio-Economic Development of Poland and the Creation of the Knowledge Society

The above considerations lead to the following questions: to what extent are the national strategies for the socio-economic development of Poland oriented towards or/and take into account the concept of building the knowledge society? What is the scope of Poland's involvement in the implementation of the Lisbon Strategy?

2.1. National Development Strategy 2007–2015

In the face of globalization processes and civilizational challenges, Poland too has to step up its effort to modernize and narrow the development gap between itself and the richest countries of the European Union. In response to the renewed Lisbon Strategy, Poland drew up the National Development Strategy 2007–2015 (NDS) which brings together all development measures taken to improve the social and economic conditions. NDS is a fundamental strategic document that lays down the objectives and priorities for Poland's socio-economic development and defines conditions which should ensure this development. The National Development Strategy was drawn up in line with the strategic and programming documents of the European Community and the government of the Republic of Poland. It takes into account such EU documents as the Lisbon Strategy, EU Sustainable Development Strategy, Community Strategic Guidelines – Cohesion Policy 2007–2013, Integrated Guidelines on Growth and Employment 2005–2008 and other strategic EU documents relating to specific areas, e.g.: the programme „Education and Training 2010”, information society („2010 – European information society for growth and employment”), development of science and innovation (projects of the Framework Programme for Competitiveness and Innovation) and 7. Framework Programme for Research, Technological Development and Demonstration Activities 2007–2013. The National Development Strategy is also based, among others, on the following national documents: The National Reform Programme 2005–2008, Convergence Programme – the 2005 update and many other documents. It also refers to the document Poland 2025 – Long-term strategy for durable and sustainable growth¹. NDS is the principal, multi-year strategy for

¹The document „Poland 2025 – long-term development strategy” was drawn up by the Government Centre for Strategic Studies. It was adopted and recommended to the Council of Ministers in 2000. As a long-term development strategy, i.e. the first strategy to cover a 25-year period, it draws attention to the need of taking steps to create a knowledge society and

Poland's social and economic development, constituting a reference for other strategies and government programmes, as well as for the ones drawn up by units of territorial self-government.

As stated in the introduction to the strategy, „its task is a courageous, but at the same time realistic programming of development and modernisation of the country, with special regard to advantages arising from Poland's presence in the EU, and from all resources and assets that the country possesses, for the development and improvement of the level and quality of life²”. To use these resources and assets, such as a large number of young and better and better educated Poles, high entrepreneurship of the Polish society and a large internal market, the development policy must be based on continuous efforts to build a knowledge-based society and economy. From a long-term perspective of the economic development of the EU and Poland as its Member State, making progress in the implementation of the Lisbon Strategy is especially important. Assessments of Poland's performance show clearly that, for most of knowledge economy indicators, Poland is lagging behind not only the EU-15, but also behind other new Member States. Therefore, Poland should perceive the implementation of the Lisbon Strategy not only as a great challenge, but also as an incentive to speed up the economic development.

According to the Vision of Poland until year 2015, „Poland must develop a knowledge-based economy, with widespread application of information and communication technology in all areas of national economy and with social services available for every citizen³”. The document emphasizes that the State will promote the development of intellectual capital, both of individual persons and organizations. At the same time, the State should create favourable conditions for professional and financial promotion of the most talented, creative and enterprising persons. It is also essential to increase the activeness and social and professional mobility of the population, and to ensure a high level of education and continuous upgrading of qualifications by workers.

The main objective of the National Development Strategy is to raise the level and quality of life of the inhabitants of Poland, of each citizen and family. The State's policy is intended to help in the attainment of this goal by providing

a knowledge-based economy. The vision of Poland of 2025 envisages that, by then, the Polish society will transform into a knowledge society, capable of utilizing the growing numbers of information resources by using modern technologies – an innovative and creative society. A knowledge-based economy (also referred to as a competitive economy), dominated by modern technologies and high quality human capital, will constitute a foundation of this society.

² National Development Strategy 2007–2015, the Ministry of Regional Development, Warsaw 2006, p. 8.

³ as above, p. 26.

conditions for rapid and sustainable economic development of the country. In the context of current social and economic problems of Poland, resulting from development gaps, underinvested Polish economy and external conditions, the following priorities were identified as the most important:

1. Growth of competitiveness and innovativeness of the economy.
2. Improving the state of technical and social infrastructure.
3. Increasing employment and improving its quality.
4. Building an integrated social community and its safety.
5. Development of rural areas.
6. Regional development and raising the level of territorial cohesion.

The creation of a knowledge-based economy was taken into account in priority 1 of the NDS – „Growth of competitiveness and innovativeness of the economy”, which points to the need of raising the technological level of the economy by increasing expenditure on research, development and innovations (increasing expenditure on R&D, strengthening cooperation of scientific and research entities with enterprises, targeting research expenditure) and the development of the information society (widespread acquisition of skills in the use and application of information and telecommunication technology, development of electronic services, national strategies for ICT diffusion). Priority 1 takes into account the role of higher education – recognizing tertiary education institutions and other scientific and research centres as the main source of innovation. In pursuit of this priority, the State’s spending on science and higher education will be increased. The development of information and telecommunication infrastructure of the country (including the public, fiscal and judicial administration) is also mentioned in Priority 2 – „Improving the state of technical and social infrastructure”. Lifelong learning is a prerequisite for survival in a knowledge society.

This is why priority 3 – „Increasing employment and improving its quality” comprises measures intended to promote the idea of lifelong learning. The improvement of information and telecommunication infrastructure and the development of human capital are also mentioned in the remaining priorities, i.e. 4 – „Building an integrated social community and its safety”, 5 – „Development of rural areas”, 6 – „Regional development and raising the level of territorial cohesion”.

The analysis of the priorities of the NDS shows clearly that Poland has accepted the new developmental paradigm for Europe and is fully aware of the necessity to strive towards a knowledge-based economy, i.e. towards the objective set by the Lisbon Strategy. However, the document does not say anything about the need to create a knowledge society. The only reference to the

knowledge-based economy can be found in the description of measures taken „to respond to the challenges of the knowledge-based economy”.

As follows from the analysis of the basic document that sets the directions for the socioeconomic development of Poland in the years 2007–2015, the category of the knowledge-based society and economy does appear in this strategy, however, more emphasis is placed on the economy than on the society.

2.2. National Reform Programme 2005–2008

„The National Reform Programme 2005–2008 for Implementing the Lisbon Strategy”, adopted by the Council of Ministers in December 2005, is the national counterpart of the Lisbon Strategy⁴ in Poland. The main objective of the NRP is to maintain a high rate of economic growth conducive to the creation of new jobs, in compliance with the rules of sustainable development. The Polish National Reform Programme lists the following priorities:

In the area of macroeconomic and budgetary policy:

1. Consolidation of public finance and improvement of public finance management.

In the area of microeconomic and structural policy:

- a) Developing entrepreneurship;*
- b) Increased enterprise innovation;*
- c) Development and modernization of infrastructure and ensuring competitive environment in network sectors.*

In the area of labour market policy:

- d) Creation and maintenance of new jobs and reducing unemployment.*
- e) Improving adaptability of employees and enterprises by investing in human capital.*

As we can read in the introduction to the NRP, „investment in human capital and increased outlays on science, research, development and innovation will facilitate the implementation of the programme, which aims to create a knowledge-based society, capable of meeting both the demographic and competitive challenges in an increasingly globalised world economy⁵”.

⁴ NRP was described in this way in the White Paper of the Polish Lisbon Strategy Forum 2006 (See Woźniak P. Lisbon Strategy Priorities in Poland, in: White Paper of the Polish Lisbon Strategy Forum (PFSL) 2006, p. 25).

⁵ The National Reform Programme 2005–2008 for Implementing the Lisbon Strategy, Warsaw 2005, Introduction, p.3.

Unfortunately, it has to be admitted that in view of the current situation, the education level of the society does not satisfy the requirements of a knowledge-based economy (the percentage of people with secondary and higher education is too low). Therefore, priority 6 – „Improving adaptability of employees and enterprises by investing in human capital” points to the need of improving the quality of education and vocational training. This will result in better preparation of school leavers and trainees for employment and self-employment. It is also essential to increase the participation of adults (especially from the so-called risk groups) in continuing education. Legislative solutions will be introduced to facilitate the attainment of these goals, stimulating the demand for educational services and increasing the participation of adults in continuous education. The above-mentioned legislative solutions are to be accompanied by legal measures to improve the quality of education and training, such as the amendment of the Act on the promotion of employment and labour market institutions.

The postulate of investing in human capital will be implemented through the following institutional instruments:

- development and implementation of a cross-sectional „Lifelong Learning Strategy”,
- development and implementation of system solutions for the improvement of the quality and effectiveness of education and training (taking account of key competencies in teaching and testing standards, in teacher and trainer education and improvement programmes, in the evaluation of teaching and training and the development of a system of accreditation of lifelong learning institutions),
- creation of a system for validation and certification of qualifications obtained outside the educational system), adjustment of the contents and programmes of training and professional development to the needs of the labour market on the basis of regularly updated professional qualifications standards, facilitating the dissemination of information about continuous education and promoting of the idea of lifelong learning, enhancing cooperation with social partners,
- implementing solutions to support the development of distance learning (e-learning) and professional counselling in order to remove barriers in access to education caused by poverty or disability,
- creation of the National Qualification System and the National Qualification Framework to facilitate comparison between levels of professional and general qualifications of workers from different Member States of the EU⁶.

⁶ The National Reform Programme 2005–2008 for Implementing the Lisbon Strategy, Warsaw 2005, Introduction, p 40.

According to the NRP, the level of innovativeness of Polish enterprises is also too low. If this situation persists for a long time, Polish enterprises will be increasingly at a competitive disadvantage in future. Innovative processes in company environment are assessed as equally unsatisfactory. These processes are measured with such indicators as: gross expenditure on R&D activities as a share of GDP, balance of payments in the area of technology, foreign trade in high-technology goods produced in a given country and the number of patent applications. Limited spending on the R&D sphere, low effectiveness and the lack of organizational and institutional measures to adjust this sphere to the needs of entrepreneurs, as well as insufficient links of R&D with science and economy in Poland all cast a shadow on long-term prospects for the development of Polish economy. To remedy these problems, the following specific objectives were set out under priority 3 – „Increased enterprise innovation”: 3.1 – „Development of the innovation market”, 3.2. – „Support for research and development area”, 3.3. – „Development of institutional environment to enhance cooperation between the R&D sector and the economy”. Due to low rates of ICT diffusion in administration, business, education and health protection sector and a low level of expenditure on electronic information and communication technologies (ICT), priority 3 was extended to include specific objective 3.4. – „Development of information and communication technologies in economy and administration”. Each of the above priorities comprises a list of legislative solutions and institutional and organizational instruments to assist in the implementation of the Programme’s objectives.

To sum up, the National Reform Programme is targeted at the creation of an innovative and competitive economy and a *knowledge society*. *In passages relating to investment in human capital, several references are made to the low percentage of people with higher education in comparison with other EU countries. There is also one sentence about a low percentage of people studying technical and ICT-related disciplines. Unfortunately, the question of tertiary level education for the needs of a knowledge society and knowledge-based economy and the role of higher education institutions in the creation of such a society and economy remains almost completely unaddressed.*

The strategic goals set forth in the two above-described documents are also taken into account in several subsequent documents setting the directions for the socio-economic development of Poland:

1) The National Strategic Reference Framework (NSRF) 2007–2013, National Cohesion Strategy (NCS)

The document outlines the directions of financial aid available from the EU budget in the forthcoming 7 years under the European Regional

Development Fund (ERDF), European Social Fund (ESF) and the Cohesion Fund (in the years 2007–2013 Poland will be the greatest beneficiary of the European cohesion policy). NSRF is a reference instrument for the development of operational programmes. At the same time it is aligned with the provisions of the National Development Strategy for the years 2007–2015 (NDS) and the National Reform Programme for the years 2005–2008 (KPR), while also responding to the challenges contained in the Lisbon Strategy.

„The strategic goal of the National Strategic Reference Framework for Poland is to create conditions for the growth of competitiveness of the knowledge-based economy and entrepreneurship, to ensure a growth of employment and to raise the level of social, economic and territorial cohesion⁷”. The main directions of the cohesion policy for achieving the strategic objective are reflected in the structure of the horizontal objectives, which are as follows:

1. Improving the functioning standard of public institutions and developing partnership mechanisms.
2. Improving the quality of human capital and enhancing social cohesion.
3. Development and modernization of technical and social infrastructure essential for the growth of Poland’s competitiveness.
4. Improving the competitiveness and innovativeness of enterprises, in particular of the manufacturing sector with high added value and developing the services sector.
5. Enhancing the competitiveness of Polish regions and preventing their social, economic and territorial marginalization.
6. Providing equal development opportunities and supporting structural changes in rural areas.

2) Operational Programme Innovative Economy (2007–2013)

The creation of the knowledge based economy is mentioned in almost all priorities (6) and objectives (6) these objectives, either directly (objectives: 1, 5 and 6) or indirectly (in objectives 2 and 3, which relate to the development of Polish science). The objective „Increasing the role of science in economic development” even contains a reference to the so-called „triangle of knowledge”, consisting of research, education and innovations. In other words, if Poland’s economy is to become competitive and based on knowledge, the potential of knowledge must be increased through scientific research,

⁷ The National Strategic Reference Framework 2007–2013 in support of growth and jobs (The National Cohesion Strategy), the Ministry of Regional Development, Warsaw 2007, (document approved by the European Commission), p. 40.

disseminated through education and introduced to the economy through innovation. Only such a synergy, together with a new approach to innovation (*open innovation*⁸), allows for close cooperation of scientists with entrepreneurs, and hence for enhancing the role of science in the economy. Furthermore, it is assumed that the Operational Programme Innovative Economy will also serve as a basis for a science development strategy, so that it can become a driving force for the economic development of the country.

Summing up, the Operational Programme Innovative Economy is targeted at the creation of a knowledge-based economy through measures promoting innovations and the development of science and ICT. These measures are taken into account in particular priorities and detailed objectives, at the same time constituting a larger whole. However, they have not been brought together in separate programmes, as had been planned by the previous government team in the draft of the National Development Programme 2007–2013⁹. The above-mentioned draft had incorporated two additional Operational Programmes – „Science, Modern Technologies and Information Society” and „Innovations-Investments-Open Economy”.

3) Operational Programme Human Capital

Similarly to the OP IE, the Operational Programme Human Capital (OP HC), serves as one of the instruments for implementing the National Strategic Reference Framework 2007–2013 (NSRF). Being aligned with the strategic objective of the NSRF (i.e. inter alia, the creation of conditions for growing competitiveness of the knowledge-based economy and entrepreneurship in order to boost employment and increase the level of social, economic and territorial cohesion), the programme nonetheless mainly concentrates on the fulfilment of the second horizontal objective of the NSRF, i.e. on improvement of the quality of human capital and greater social cohesion. This aim is achieved within the framework of the main objective of the OP HC: „Promoting a high level of employment and social cohesion”. The above main objective is further subdivided into the following five detailed objectives:

⁸ This strategy consists in looking for and combining new ideas that are complementary to the already existing scientific and research projects and help to remove geographical and technological barriers which hinder the development of new products and markets.

⁹ The Information and Promotion Department at the Ministry of Regional Development informed that the National Development Plan 2007–2013 had been proposed by the previous governing team. On the basis of the NDP, the current Government drew up the National Strategic Reference Framework 2007–2013 and this document is legally valid now.

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- Detailed objective 1. Adaptation of human resources to the changing labour market.
 - Detailed objective 2. Reducing areas of social exclusion.
 - Detailed objective 3. Improving the level and quality of education in compliance with the requirements of the labour market.
 - Detailed objective 4. Promoting the creation of an efficient and citizen-friendly State.
 - Detailed objective 5. Increasing the level of territorial cohesion¹⁰.

The Programme's objectives were defined in line with the principle of strategic planning. For this reason, support measures concentrate on key areas and essential problems that require intervention with regard to employment and improvement of the quality of human capital. At the same time, these support measures are comprehensive enough to allow for an appropriate extension of the scope of available aid, in accordance with the nature of problems arising on the Polish labour market. The Operational Programme Human Capital consists of 11 Priorities, simultaneously carried out at central and regional levels.

Objective 3 („Improving the level and quality of education in compliance with the requirements of the labour market”) contains a direct reference to the need of investing in human capital, associated with the imperative of building a knowledge-based economy in Poland. It comprises actions targeted at raising the level of education and competence of the human capital. They focus around three strategic impact areas: increasing the availability of education, improving its quality and adapting the educational offer to the requirements of the labour market. They will be carried out by providing assistance within the framework of four Priorities. The actions listed under Priority III („High quality of the education system”) are designed to provide support for the education system and institutions, leading to their grater efficiency and modernization and, consequently, to an improvement of the quality of educational services. In addition, Priority III comprises national programmes aimed to provide educational opportunities and to help pupils in the acquisition of key competences. Priority IV („Higher education and science”) covers in its scope measures intended to improve the quality of higher level education and to make it more responsive to the needs of a competitive and innovative economy. Priority IX („Development of education and competence in regions”) focuses on providing assistance for individual persons, for example through improved access to pre-school education, regional scholarship programmes and

¹⁰ Operational Programme Human Capital 2007–2013, the Ministry of Regional Development, Warsaw 2006 (version approved by the Council of Ministers).

popularization of the model of lifelong learning. The actions listed under Priority X („Partnership for the development of rural areas”) will be taken to raise the level of education and competence among the inhabitants of rural areas. At the same time, the above actions will contribute to the attainment of objective 1 („Adaptation of human resources to the changing labour market”), since goals such as the adjustment of qualifications of the working-age population to the requirements of the labour market and the promotion of the idea of lifelong learning, especially among people with low and outdated professional qualifications, are identified as key issues. It is worth mentioning that the draft of the National Development Plan 2007–2013¹¹ contained a separate Operational Programme – „Education and Competences”. It aimed to improve the education level of the society by equipping individuals with key competences in order to increase their competitiveness on the labour market, at the same time preparing them for active and responsible participation in the social and economic life.

An analysis of the objectives and priorities contained in the Operational Programme Human Capital leads to the following conclusion: successful implementation of this Programme does offer the possibility of creating a knowledge society in Poland¹². Moreover, it is the first document that takes into account not only a knowledge-based economy, but also the development of a knowledge society in the current plans of the socio-economic development of the country¹³. It becomes apparent in the very introduction to the OP HC, which says that „the level of employment, the degree of social inclusion and the creation of a knowledge-based society are factors that determine the socio-economic development, at the same time contributing to the attainment of the main objective of the NSRF¹⁴”. Consequently, actions that promote the

¹¹ The National Development Plan 2007–2013 was replaced with the National Strategic Reference Framework 2007–2013 (reminder from the author).

¹² *Such an opinion on the OP HC has been presented by the Knowledge and Innovation Institute (See: Piech K., Pangsy-Kania S. Opinia na temat wstępnej wersji Programu Operacyjnego Kapitał ludzki z 31 maja 2006 r. W kierunku kreowania społeczeństwa wiedzy w Polsce, Opinie i rekomendacje” nr (2), 2/2006, s. 2 – Opinion on the preliminary draft of the Operational Programme Human Capital of 31 May 2006. Towards the creation of a knowledge society in Poland, Opinions and recommendations” No.(2), 2/2006, p. 2)*

¹³ A much higher status had been given to the knowledge society in the socio-economic development plans of Poland in previous years. The Sectoral Operational Programme of Development of Human Resources 2004–2006 (SOP DHR), whose actions are to be continued by the OP HC, contained an additional priority – Priority 2. Development of a knowledge-based society. The main objective of the SOP DHR was to build an open, knowledge-based society by ensuring conditions for the development of human resources through education, training and employment.

¹⁴ Operational Programme Development of Eastern Poland 2007–2013, the Ministry of Regional Development, Warsaw 2007 (version approved by the Council of Ministers), Introduction, p. 4.

development of human resources should concentrate, among others, on the construction of a knowledge-based society by improving education and qualifications. Another reference to the significant role of the Programme in the development of the knowledge-based society is made in the strategy pertaining to the objectives of the OP HC. As can be read in this strategy, human resources will be developed by improving professional qualifications, adjusting skills to the needs of the labour market and popularising the concept of lifelong learning. It is worth mentioning that the draft version of the National Development Plan 2007–2013 contained a separate Operational Programme „Competence and Education”. It called for the creation of an education system which would be capable to respond quickly to the needs of the knowledge-based society. It also stressed the need of intensifying efforts to promote greater social and professional integration.

2.3. Education

It provides for strategic measures in the field of education in Poland, at the same time contributing to the achievement of the objectives of the Lisbon Strategy and the work programme „Education and Training 2010”, adopted by the Ministers of Education of the EU and the European Commission in 2002. „The Strategy for the Development of Education 2007–2013” is designed to improve the level of national education level by 2013 (70% of 25 to 45-year-olds who complete at least secondary education) and to ensure a high level of teaching. It also emphasizes the importance of continuous upgrading of qualifications by adults.

Addressing the issue of higher education development, the strategy takes into account the Bologna Declaration, which was adopted by the Ministers of Education and the candidate Member States in 1999. The aim of the Bologna Declaration is to create, by 2010, the European Area of Higher Education and thus to establish a „Europe of Knowledge” by strengthening its intellectual, cultural, social, scientific and technological dimension. A government document which specifically concentrates on higher education is „The Strategy for the Development of Higher Education in Poland in the period up to 2010”, drawn up by the Ministry of National Education in 2004. Unfortunately, „The Strategy for the Development of Education 2007–2013” makes no use whatsoever of the earlier strategy¹⁵, and what is worse, the document which specifically focuses on

¹⁵ Moreover, the separate document on higher education is not even placed on the web site of the Ministry of Science and Higher Education (www.nauka.gov.pl).

higher education is not even placed on the web site of the Ministry of Science and Higher Education.

The country's education policy with regard to vocational education and training, formulated in the „The Strategy for the Development of Education 2007–2013”, is based on the arrangements laid down in the so-called Copenhagen Declaration from 2002. Another document which exclusively addresses the above-mentioned issues is „The Strategy for the Development of Continuing Education in the period up to 2010”, produced by the Ministry of National Education and Sport in 2003. According to this document, it is strategically important, in the context of building a knowledge-based society, to assign a proper status to the concept of lifelong learning in Poland and to identify the directions for continuous development, coordination and monitoring of changes taking place in Poland, at the same time taking into account social expectations and the feasibility of these measures.

2.4. Science and R&D Sphere

The documents that are strategically important for the development of science in Poland include, without any doubt, the ones compiled by the Ministry of Science and Information Technologies¹⁶ in 2004 – „Guidelines for Poland's Scientific, Scientific-Technological and Innovative Policy in the period up to 2020” and its more detailed version „Proposed Directions for the Development of Science and Technology in Poland in the period up to 2020”. Both these documents are consistent with the provisions of the National Development Plan 2004–2006, adopted by the Council of Ministers in 2003, and their implementation is to be continued in the National Development Plan 2007–2013¹⁷. Considering the distant time horizon, the programming document should be updated every 3 years.

The above-mentioned Guidelines lay down the directions and aims of the development of science, which are significant for the attainment of the postulate to create a knowledge-based economy and knowledge society in Poland. In the

¹⁶ The Ministry of Science and Higher Education ceased to exist on 31 October 2005, pursuant to a decision of the previous governing team. The ICT department was taken over by the Ministry of Internal Affairs and Administration. The tasks of the Ministry of Science and Information Technologies relating to science were taken over by the Ministry of Education and Science, which was transformed into the Ministry of National Education on 5 May 2006. The Ministry of Science and Higher Education, established on 5 May 2006, also deals with matters of science.

¹⁷ The National Development Plan 2007–2013 was replaced by the National Strategic Reference Framework 2007–2013 (reminder from the author).

context of the knowledge-based economy, the document contains general references to the need of mainstreaming support for science, first of all for scientific research and disciplines in which Poland is able to compete internationally. It is also important to focus on directions that will boost the competitiveness of the Polish economy. Bearing that in mind, the authors of the second of the above-mentioned documents present a detailed description of proposed directions for the development of science and technology in the period up to 2020. Another programme that helps to target the development of research and technology at areas that ensure the dynamic medium and long-term development of the economy, while also optimising public expenditure, is the National *Foresight* Programme¹⁸. It establishes three research fields: sustainable development of Poland, information and telecommunications technologies and safety. The development of science is also aimed to enhance the organizational and scientific potential of human resources through organizational and structural changes at the Polish Academy of Sciences, higher education institutions and R&D entities. In addition, it is to ensure greater mobility of scientists. As regards the creation of a knowledge society, „The Guidelines ...” point to the role of science in the above-mentioned civilizational and cultural development of the society, among others by raising public awareness of the significance of science, popularization and of its achievements and promotion. In connexion with the above, the documents presents a list of the following changes which are essential for the attainment of the established 6 goals.

Conclusions

As can be concluded from the analysis of the basic documents setting the directions for the socio-economic development of Poland for the years 2007–2015, in these documents the category of the knowledge society and knowledge-based economy is essential in defining priorities and specific objectives for further socio-economic development of the country.

Nonetheless, the creation of the knowledge-based society and economy is referred to as a challenge and opportunity for long-term development. It is also mentioned in connection with the removal of barriers and existing social risks (such as high unemployment, shortcomings of the education system and scientific research, low innovativeness of the economy, social exclusion, etc.). In general, however, higher education institutions play a fairly marginal role in all strategic programmes. The above-discussed documents present a more or less far-sighted vision of Poland (even up to 2025), formulated in accordance with

¹⁸ Undertakings relating to the implementation of the National Foresight Programme „Poland 2020”, Minister of Science and Higher Education, Warsaw 2006.

the principles of strategic planning and performance. The documents identify the economic and social policy priorities for each stage of the development process and they also attempt the difficult task of coordinating the endless number of various actions and processes, grouping them together under specific strategic objectives. They also demonstrate that it is possible to reach compromises in a creative way and to win social support¹⁹. But is it really possible?

The analysis of the above documents shows that, from the point of view of the Lisbon Strategy and in particular of its objective of building a knowledge-based economy and creating a knowledge society, the Polish policy of the socio-economic development is consistent with all-European trends. However, successive governments find it difficult to maintain continuity in the implementation of some of successively introduced programmes and strategic objectives. It should also be noted that only a generational strategy can make it possible to narrow the development gap between Poland and the most developed countries. The current government team has rejected the development plan and strategy drawn up by their predecessors, because in their opinion they were not perfect. However, the government is making changes to the development policy of the country without offering any convincing explanations that would be physically and intellectually accessible to the average citizen. It is hardly surprising then that the public is unwilling to participate in the debate on Poland's future, especially when one considers that ambiguities emerge even at the planning stage – perhaps suggesting a conflict of interests or incompetence of politicians. Thus, it remains an open question whether such a development policy can really lead Poland to the Europe of Knowledge in the next few or a dozen or so years.

3. Strategies for the Socio-Economic Development of the Łódzkie Voivodeship

The most important challenges for the country and the objectives aimed at achieving socio-economic and territorial cohesion with other countries and regions of the Community are described in „The National Strategic Reference Framework for the years 2007–2013 (NSRF) in support of growth and jobs”. Particular Operational Programmes incorporated in the NSRF support undertakings of supraregional, national and international scope and significance,

¹⁹ The elements of the strategy leading to dynamic development. Based on: G. Kołodko, *W poszukiwaniu strategii rozwoju polskiej gospodarki*, a paper presented at the conference entitled „Proposals for Poland” Warsaw Management School – Graduate and Postgraduate School, 21 June 2001 (http://www.tiger.edu.pl/kolodko/kolodko/referaty/pl/WSzZarzadzania_21_06_01.pdf).

while the Regional Operation Programme of the Łódzkie Voivodeship for the years 2007–2013 defines actions of regional, subregional and local scope²⁰. The regional authorities present their vision of development in „The Łódzkie Voivodeship Development Strategy for the years 2007–2020”.

3.1. Regional Operation Programme of the Łódzkie Voivodeship for the years 2007–2013

The ROP LV lays down two priority axes which contribute to the creation of the knowledge society/knowledge-based economy. These priority axes are aligned with the EU guideline of promoting innovation, entrepreneurship and facilitating the development of the knowledge-based economy (axis III – Economy, Innovation and Entrepreneurship and axis IV – Information Society). Axis III envisages, among others, providing support for R&D work and for the operation of the business environment institution which is intended to facilitate the development of cooperation between the spheres of science and business²¹. This axis supports the growth of innovation and competitiveness of enterprises through a system of direct investment subsidies (based on a flexible system of assessing innovation in accordance with RSI LORIS²² and the Development Strategy for the Łódzkie Voivodeship). Axis IV sets forth operational objectives such as improving the use of advanced information technologies by inhabitants of the region and levelling out the disparities in accessibility and use of information and telecommunication

²⁰ The Operational Programme Human Capital consists of two components: central and regional. The priorities of regional scope include, among others: Priority VIII – Human resources in regional economy and Priority IX – Development, education and competences in the regions. Issues associated with the development of higher education were incorporated in the central component: Priority IV – Higher education and science.

²¹ Examples of cooperation between science and business that has been established up to now include: a project entitled „Łódź cluster as a network of cooperation for innovation in the region”, implemented in the years 2005–2006 (www.klasterlodzki.pl) or „Platform for the transfer of knowledge between R&D sector and enterprises – pilot project”, designed as an internet portal aggregating information in the database system and facilitating the dialogue between scientific and research establishments and enterprises (www.nauka-biznes.org.pl) and the activity of „The Centre of Excellence in the area of knowledge-based economy KNOWBASE”, a research unit of the Łódź University (www.knowbase.uni.lodz.pl).

²² „The Regional Innovation Strategy for the Łódzkie Voivodeship RSI LORIS 2005–2013” is intended to transform the Łódzkie Voivodeship into a region based on knowledge. The main task set before RSI LORIS is to build a lasting partnership between industry, local government and government administration, scientific and research entities and business infrastructure. Another project – LORIS PLUS is currently being implemented to increase the effectiveness of RSI LORIS.

technologies (ICT) in the territory of the Łódzkie Voivodeship. Priority axis V – Social infrastructure – envisages measures designed to raise the level of knowledge and to adapt competences to the needs of the labour market through the development of educational infrastructure, including the infrastructure of higher education.

3.2. The Łódzkie Voivodeship Development Strategy for the years 2007–2020

This strategy sets out two main aims: raising the general civilizational level of the voivodeship (social sphere), improving the competitiveness of the economy of the voivodeship (economic sphere) and creating a real socio-economic region with its own cultural and economic identity (functional and spatial sphere).

As can be concluded from the analysis of the priority areas, they do take into account issues that are important for the creation of the knowledge society/knowledge-based economy. Priority area „Knowledge and competences” provides for measures aimed at: making a better use of the potential of higher education and research centres, promoting activity in the area of international education, establishing closer links between science and economic growth of the region and equalising opportunities in the access to education (at every level of education). It also provides for measures designed to improve the quality of education and to raise and adapt qualifications of regional human resources to the requirements of the labour market. The area „Economic base” is aimed at the creation of a modern, pro-development and innovative economic base, among others by enhancing the research and development potential of the region and improving the effectiveness of the technology transfer process. In the area „Information society”, ICT diffusion in all areas of socio-economic life and ensuring common access to these technologies are highlighted as the most important²³.

²³ „i-Łódzkie 2013. Programme for the Development of the Information Society in the Łódzkie Voivodeship in the period up to 2013”, adopted in September 2007. It proves how important the creation of the information society is for the Łódzkie Voivodeship. The Programme distinguishes three strategic priorities: Human Capital for eDevelopment, Economic growth based on ICT and user-friendly on-line services for inhabitants. The main projects include, among others: „Łódzki Programme E-Integration” designed to reduce digital exclusion and promote e-Integration of rural communities, „Innovations for the Knowledge Economy” promoting research for eDevelopment and facilitating the introduction of innovative services and ICT products to stimulate economic growth and work productivity. Another programme – „Voivodeship Programme of Universal Education for the Information Society” is aimed at drawing up and implementing a universal

Conclusions

The term „knowledge society” is virtually non-existent in the analysed strategic documents of regional scope. The term ‘knowledge-based economy/ knowledge economy’ is used instead, especially with reference to economic matters. The development of the information society is treated as a separate issue. In visions, missions, aims and priorities, the economic aspect associated with the information and telecommunication technologies is clearly emphasized, however, it is not linked with education, training or areas of social development to form one entity – the knowledge society.

4. Progress Made in Building the Knowledge-based Society and Economy in Poland

The documents setting out the strategic objectives for the socio-economic development of Poland present an evaluation of the progress made in creating the knowledge-based society and economy. As follows from these analyses, the level achieved in building the knowledge-based society and economy in Poland is low, both in absolute and relative terms (in comparison with other countries of the EU). The above assessment is based on the following specific and overall indicators:

- 1) low level of innovativeness of the Polish economy (measured by the percentage of the so-called innovative enterprises and the participation of high-tech products in the export);
- 2) very low outlays on the R&D sector (among the lowest in the EU, as measured by GERD to GDP ratio) – 0,345%;
- 3) the lowest percentage of people with secondary education among the EU countries – 30,6%;
- 4) low percentage of people with higher education – 10,2%;
- 5) high rates of functional illiteracy among Poles;
- 6) a low percentage of students choosing studies in the fields of mathematics, science and engineering;
- 7) limited access to the Internet (about 1/3 of schools have no access to the Internet, mostly in rural areas);

8) only 17,3% of employees (according to data from 2003) performed the so-called information work (47,5% of employees performed traditional jobs – i.e. without using the computer and the Internet).

The data compiled by the World Bank Institute (2004) show (on the basis of an overall indicator taking into account 4 specific indicators) that, among the new Member States of the EU, Poland is the least advanced country in terms of building the knowledge society.

Specific indications (for the knowledge based economy):

1) the number of information and communication equipment, including computers, per one citizen of a given country;

2) the percentage of people skilled in the use of information and telecommunication technologies (computer, the Internet) in relation to the total number of citizens of a given country;

3) a percentage share of the sector of information and telecommunication industry and services in relation to other types of services and sections of national economy in the obtained global product and national income of a given country;

4) the rate of employment in the sector of services and information and telecommunication industry in comparison with the total number of employees; in addition, carrying out a percentage assessment of changes in social preferences with regard to participation in traditional forms of entertainment, such as the cinema, theatre, reading and show performances, in relation to their electronic counterparts.

The report compiled under the United National Development Programme (UNDP) „Education for employment” (September 2007) reveals that Poland has a large number of schools (especially at higher level – 412), however, they do not teach too well. Above all, they fail to prepare students for professional life and respond too slowly to market needs. If teaching methods and the structure of education do not change (at secondary and higher level), youth unemployment will remain high, while employers will have problems with finding employees. According to the Report, there is no cooperation between the local government, schools and business. Moreover, schools have no funds to invest in new technologies (low level of expenditure on education). The authors of the Report point out to the absence of vocational guidance and counselling. Neither are there any prognoses or information about the needs of the labour market in Poland. As can be seen from the Report of the United National Development Programme, the functioning of the education system (especially at secondary and higher level) gives rise to a lot of criticism and requires essential changes.

5. Participation of Local Social Actors in the Creation of the Knowledge-based Society and Economy

5.1. Basic Conclusions from the Interviews

At local level, trade unions, employers, non-government organizations, the local government and bodies responsible for the allocation of EU funds (European Social Fund) and the University were identified as key actors. In connection with the above, interviews were carried out with representatives of all these groups of local stakeholders (see annex IV). Then a focus group was organized and representatives of all the above-mentioned groups were invited to participate in it. Interviews were conducted with the following people:

Expert I

A representative of the trade unions (member of the Management Board of the Independent and Self-Governing Solidarity Trade Union of the Łódź Region – physicist, academic teacher).

Expert II

A representative of employers (President of the Management Board of the Regional Union of Employers in Łódź; owner of an IT firm and a private school; coordinator of a project financed from EU funds under action 2.6 „Transfer of knowledge from the world of science to the economy (business)”, a former academic teacher.

Expert III

A representative of non-government organizations (President of the Foundation for Promotion of Entrepreneurship – one of the oldest non-government organizations oriented towards education in business – Doctor of Economic Sciences – academic teacher. The Foundation operates as a Contact Point for the Framework Programmes of the European Union.

Expert IV

Professor, academic teacher; expert of the State Accreditation Committee, sociologist interested in the implementation of the Bologna Process and other educational issues.

Expert V

A representative of an intermediary institution of the 2nd level (Voivodeship Labour Office) responsible for the implementation of „areas of support for the Operational Programme Human Capital: employment, entrepreneurship and social integration”).

Expert VI

A representative of the local authorities (Director of the Department for the Operational Programme Human Capital at the Marshal's Office).

As follows from these meetings, the category of the knowledge-based society and economy is poorly rooted in the consciousness of the local actors (although the level of this consciousness is varied). They are much more aware of their „participation in the implementation of the Lisbon Strategy” (as they themselves describe their role).

Among all the interviewees, the highest awareness of involvement in the creation of „the innovative economy” (understood as utilisation of EU funds within the framework of the Operational Programme „Innovative Economy”) was demonstrated by entrepreneurs. It must also be noted that entrepreneurs assessed cooperation between business and science as unsatisfactory (mainly due to insufficient interest of researchers in cooperation with enterprises).

Although entrepreneurs seem willing to cooperate with research units of the University (despite their negative opinions on the level of education), they do not articulate any expectations towards the University as an educational institution.

The representative of a non-government organization demonstrated a high level of awareness of the Lisbon Strategy objectives (in terms of the knowledge society). The foundation run by this expert organizes training sessions, seminars and conferences for entrepreneurs, conducted by representatives of scientific communities. In the opinion of this expert, both sides (i.e. business and science) show little interest in this form of activity.

Trade unions, on the other hand, concentrate (as can be concluded from the interview) almost entirely on defending employee rights. In their opinion, frequent violation of these rights in Poland constitutes the main threat for the country's economic development. The highest awareness of the role performed in the creation of the knowledge-based economy and society could be observed among the representatives of the local authorities who are directly involved in the allocation of EU funds under particular operational programmes.

In the case of academic teachers, the awareness of the key role of the University or the entire education system in the creation of the knowledge-based society and economy (or, more operationally, in the implementation of the Lisbon Strategy) depends on the nature of their scientific and research interests (those who deal with these issues are, theoretically at least, aware of such participation). Nonetheless, their interest and involvement in drawing up or implementation of new study curricula, research projects, etc. is limited. For

example, a decisive majority of academic teachers associate the „Bologna Process” only and exclusively with the system of ECTS points and the two-level system of education. Furthermore, in the consciousness of the key local actors, Poland’s accession to the EU and its participation in the accomplishment of the Lisbon Strategy (understood rather narrowly and pragmatically as the possibility of using EU funds) are perceived as a chance for the socio-economic development of the region and the country.

5.2. The Main Conclusions from the Discussion of the Focus Group, Entitled: „Poland and the challenges of the Lisbon Strategy – strategies and regional and local actions”

Seven out of 9 invited guests took part in the discussion, as well as 2 representatives of the research team (one as a participant and the other as the moderator). All previous analyses showed clearly that the category of the knowledge-based society and economy and the new social risks associated with it are not well-rooted in the social consciousness, therefore the topic of the discussion was formulated in the above way. In the first part of the discussion, the participants of the focus group presented their points of view on opportunities and risks associated with the implementation of the Lisbon Strategy at local (regional) level. In the second part, the moderator attempted to introduce key problems associated with the knowledge society, the role of the education system and science in shaping the knowledge-based society and economy, drawing the participants’ attention to the new social risks connected with the emergence (functioning) of the new type of society and knowledge.

In the first part of the discussion, the representatives of the local authorities (including the administrators of structural funds under the Operational Programme Human Capital and Innovative Economy) referred to the category of the knowledge-based society and economy as an essential goal of the Lisbon Strategy.

This goal was defined in a similar way by the representative of a non-government organization (who for many years has been engaged in matters associated with the use of EU funds for company training).

The category of the knowledge society was also used by the academic teacher (participant of the project under the EU financed Profit Programme), who used this term in the context of youth education, saying that educational institutions (from nursery schools to university) should be more effective in preparing young people for future professional work and proper functioning in social life.

In contrast, the representative of employers (entrepreneurs) used the term 'innovative economy': on the one hand he ascribed a key role in its creation to entrepreneurs themselves, on the other hand he stressed the need for cooperation between business and research centres (including the University).

The representative of one of the two largest trade unions in Poland expressed a view that the Lisbon Strategy offered a chance to create „more and better jobs”. In his opinion, the attainment of this goal was jeopardized, first of all, by the currently applicable labour law.

The representative of the Research Team presented a brief overview of problems associated with the knowledge-based society and economy, outlining the basic assumptions of the Lisbon Strategy (with special emphasis on the role of the University as an educational and research institution in implementing this Strategy). In the second part of the meeting, many attempts were made to focus the discussion on the main problem (expressly stated or implicit), unfortunately these attempts were futile. For most of the time, the participants talked about the possibility of taking advantage of enormous resources allocated from the European Social Fund (504 mln euro) for the fulfilment of the Operational Programme Human Capital. The representatives of local authorities and at the same time administrators of these funds considered it to be a great opportunity for the socio-economic development of the Łódzkie Voivodeship. On the other hand, they expressed concern as to the possibility of absorption of these resources by potential beneficiaries.

Other participants of the discussion saw even more threats associated with the absorption of funds from the ESF, although each of them had doubts of different nature. In the opinion of the representative of the University, the main risk was associated with the absence of a system approach to the implementation of the Operational Programme Human Capital. He disagreed with the representatives of the local authorities, in whose opinion the Strategy for the Łódzkie Voivodeship was a sufficient tool (reference framework) that would ensure a rational and optimal use of the ESF resources. He also pointed out that the main effort of the national reform of education should concentrate on stage I (i.e. pre-school education, which should be provided for all children in Poland).

In contrast, the representative of employers stated that the main obstacle in using EU funds was the complicated and bureaucratized system of submitting applications, due to which firms had to employ or pay for the services of a qualified specialist („which most of small and medium-sized firms cannot afford”).

According to the representative of employers, another risk associated with an increase in the competitiveness and innovativeness of Polish enterprises

(especially small and medium-sized ones) is caused by insufficient cooperation of research centres (including the University) with business operators.

In the final part of the discussion, the participants exchanged their views on mutual cooperation of different key stakeholders in the region. Some debaters assessed some forms of bilateral cooperation as quite satisfactory. On the whole, however, they were quite disappointed with the mutual cooperation (most often „the other party was guilty”, of course).

The main conclusion that can be drawn from the above-described discussion is that the main actors, who should cooperate with one another in drawing up and subsequently in implementing the local strategy for the socio-economic development, have in fact failed to establish such cooperation.

All and each of them think that the ESF will help to increase the competitiveness of the Łódź region, because (as everybody agreed) the region possesses an appropriate educational and research base (especially at the level of higher education institutions), provided of course that the intellectual potential of the academic community is mobilised (i.e. there must be greater interest and involvement of academic teachers in the submission of educational and research projects).

All things considered, EU funds do offer a chance for development, whereas the most serious risk should be associated with unsatisfactory state of consciousness, insufficient qualifications and motivation of potential beneficiaries.

6. Conclusions

As can be concluded from the analysis of scientific literature and public discourse, the issues of the knowledge-based society and economy:

1) are not well-rooted in the social consciousness of Poles; although the long-term socio-economic development is treated as a way to the knowledge-based society and economy (in accordance with the provisions of the development strategy), the new social risks appearing on this way remain unnoticed. On the contrary, this new type of society and economy is perceived as a remedy for all social problems existing today;

2) both in scientific discourse and in the public education system, including higher education, these issues do appear. However, it is commonly thought that the entrepreneur is or/and should be the key actor who creates the innovative economy. In this connection, the future of Poland is much more often described in terms of an economic success rather than in terms of a social change or a modernisation process;

3) in scientific discourse (and much less frequently in public discourse), a change in the social structure (society) is most often perceived as a transition or a transformation process. Unlike the political and economic system, which had been interfered with (e.g. through privatisation), the process of changing the social structure is thought to be a result of economic transformations. For this reason, the system of education and scientific research have not been considered a basic modernisation factor for the society and economy (and even now they are recognized as such only to a slight degree). This is why the outlays on education and, in particular, on scientific research, have been decreasing since 1989;

4) as a result of Poland's accession to the EU, the category of the knowledge-based society and economy appeared in official documents laying down Poland's development strategy, in compliance with the provisions of the Lisbon Strategy and the key EU documents setting out development strategies for the entire Union;

5) the following hypothesis can be put forward in connection with the above: the terms „knowledge-based society and economy” are used in official documents, but it is a category which is not firmly rooted in the consciousness of the key social actors (stakeholders). The „Lisbon Strategy” is much better recognized, both at national and local level, whereas the strategies for the socio-economic development of Poland are aligned with or/and referred to in connection with the fulfilment of strategic objectives of the EU;

6) at local level and in the consciousness of the key local actors, the term „knowledge-based society and economy” is practically non-existent, whereas the level of conscious participation in implementing the Lisbon Strategy depends on the level of activity of particular actors involved in drawing up and implementing the regional development strategy;

7) Poland's accession to the EU and the peculiar „necessity” of participating in the implementation of the Lisbon Strategy is treated as a chance to overcome the country's civilizational backwardness and to diminish (reduce) barriers for the socio-economic development. However, the key actors fail to notice the new social risks associated with the creation of the knowledge-based society and economy;

8) both at national (to a greater extent) and local level, the key actors attribute only a slight role to the education system and scientific research in the implementation of the Lisbon Strategy;

9) the interest and actions of the local actors concentrate on maximizing the use of EU structural funds; at the same time there is no coherent or/and comprehensive strategy for the socio-economic development of the region;

10) the key local actors are not satisfied with the existing forms and character of mutual cooperation in drawing up and implementing the strategy for

regional development. Nonetheless, they fail to take actions to change this situation. Furthermore, their interest and awareness of the role of the education system and science in the creation of the „innovative economy” (the term used by entrepreneurs) is rather limited (unfortunately, it is also limited among academics).

General Conclusion

The category of the knowledge-based society and economy seldom appears in scientific and public discourse and it is not well-rooted in the consciousness of key actors.

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Michele Mariani, Monica Palmas

Department of Social, Cognitive and Quantitative Science,
University of Modena and Reggio Emilia, Włochy

Italian Labour Market and Higher Education in the Knowledge Economy

SHORT DESCRIPTION

The article, basing on literature analysis, statistical data, and empirical findings (interviews) at the level of the Italian country. The importance of knowledge as one of the most relevant (and accessible) production factors that can explain long-term growth is well accepted in Italy. The availability of young, highly educated people is acknowledged as a critical drive for country economic development and social cohesion. However, in Italy, young graduates find a job later than the EU average, earn less, and have more chances to be unemployed or to find a temporary position instead of a permanent one.

To counter such a negative scenario, two major changes were recently undertaken: the labour market reform and the „3+2” University curricula reform. Both reforms resulted in some positive impact, although with some important drawbacks, which are discussed through the report. Statistical data and interviewees opinions converge on the need to strengthen the HE-labour market connection to further reduce risks of social exclusion, which mainly affect the following groups: women, people located in southern Italy, young, first-level graduates, and those with scarce linguistic/informatics skills.

It is suggested that Universities should be the primary place of promotion of „workfare”, through the production and accumulation of human capital and up-to-date, market-ready professional profiles. The new educational offer has to be fine tuned to match the real needs of the labour market, reduce school-to-work transition lag and unneeded prolonged permanence in the educational system.

1. Introduction

The article discusses the theme: „Globalised knowledge society, new social risks and universities” at the level of the Italian country.

The text is based on three main sources: literature analysis, statistical data, and empirical findings (interviews).

The literature analysis is a review of a selected set of the most recent Journal articles and policy documents (e.g. issued by OECD, EU, etc.) that discuss the links between the general concept of ‘knowledge economy’ and the role of HE institutions both in Europe and at a global level.

Statistical data, when not otherwise indicated, are mostly taken from Almalaurea (Almalaurea 2007). Almalaurea is an institute that regularly monitors graduate occupational profiles from 1999. The 2007 report involved 185 000 graduates and 41 Universities (Atenei).

The final set of information is taken from eleven interviews carried out with stakeholders belonging to different institutions.

The text is structured in three main chapters: problem; themes; conclusions and debate. The ‘problem’ chapter contains an overview on the concept of knowledge economy and a brief summary of the recent reforms that took place in Italy both on the side of the labour market and on the side of Higher Education. The ‘themes’ chapter develops the three issues: how the concept of a ‘knowledge-based society’ is understood in Italy; the identification of the (new) social risks which are accompanying the transition towards the ‘knowledge-based society’ in Italy; the identification of both the actual and the possible roles that the Italian Higher Education institutions play in facilitating the country transition to a European knowledge society. The ‘conclusions and debate’ chapter summarizes the main findings of the studies, paving the way to further discussions.

2. Problem: Knowledge Economy, Labour Market and HE Reform in Italy

The first industrialization has been characterized by large manufactures, basing mainly on capital, mechanical technologies, physical labour and being targeted to mass production. The required competencies were quite simple, predominantly physical and easily acquired through practice. The need for education, qualification and continuous learning were scarce, given the substantial stability of production processes. The massive introduction of ICTs and the contemporary expansion of the service sector deeply changed the

scenario. A resource that has been less relevant in the past rapidly become widely accessible and available: knowledge. And knowledge is a resource of a different nature than the other 'classical' ones (natural resources, financial investments), given that its consumption does not compromise its availability.

If knowledge has become the most promising resource nowadays, the availability of high skilled human resources is one of the critical variables that affect its full deployment. The success or failure of new and old products/ services and companies rest more and more on a mixture of various competencies (e.g. informatics, marketing, management, communication, etc.). The degree to which these competencies become available at a national level highly depends on the quality, diffusion and efficiency of the national educational systems, HE institutions and lifelong learning in particular. In a knowledge economy young graduates are the most important resources of a country, representing its main intellectual capital. In turn, labour market participation is highly dependent on qualifications: „only 39% of women without a high-school or university qualification are in paid employment, compared to 61% of those with a high-school diploma and 79% of those with a degree” (Tiraboschi 2006). The extension of the educational curriculum has a relevant impact on earnings too¹. Thus, in the actual context, the availability of young, highly educated, people is decisive for country economic development and social inclusion.

However, in Europe, „the percentage of young people between 18 and 24 years taking part in higher education is less than 25 percent, compared to 37,7 percent in the USA” (Tiraboschi 2006) and lifelong learning shares are far from the expected target. At a national level, the Italian society is becoming older, the overall number of young people is constantly decreasing, and, worst of all, they're not valued as the scarce but precious resource they should be looked at. In general, in Italy, young graduates find a job later than the EU average, earn less, and have more chances to be unemployed or to find a temporary position instead of a permanent one (Livi Bacci 2005). To counter such a negative scenario, two major changes were recently undertaken: the labour market reform and the '3+2' University curricula reform.

The Labour Market Reform and the University Reform in Italy

The labour market reform has been issued in 2003 (Legge 30/2003; Ministerial decree 276/2003). Its main objective was to improve the national occupational levels, mainly by introducing more flexibility in employment

¹ Even if, in Italy, the entry wages of secondary school 'diplomati' and university graduates is constantly reducing, with the two getting closer and closer.

contracts². The so-called ‘Legge Biagi’ involved two main interventions: the introduction of new ‘flexible’ contracts (staff leasing, job on call, job sharing, etc.), and the reform of employment services, with the end of public monopoly in job placement.

The Ministerial Decree no. 509 of 3rd November 1999 set up the new university system that has been activated in the academic year 2001/02. In the previous system university studies were organised as follows (www.miur.it/guida/guide.htm):

- first level courses (three years) leading to a first degree called Diploma Universitario with an entrance requirement of school leaving qualification (Diploma dell’Esame di Stato and also known as Maturita),
- second level courses (four to five years with medicine lasting 6 years) leading to the Laurea degree,
- third level programmes leading to a research doctorate (Dottorato di Ricerca) or to a specialisation degree (Diploma di Specializzazione/Specialista) with an entrance requirement of the Laurea.

Since 1999, Italian university studies have been fully reformed so as to meet the objectives of the ‘Bologna process’. The university system is now organised on three cycles. The reform has abolished the old three year degree (diploma universitario) and the old four year degree (laurea) and has introduced the following new academic qualifications organised in three cycles (the new, so called, ‘3+2’ system):

- first cycle: First level degree (laurea),
- second cycle: Second level degree (laurea specialistica or master universitario di 1° livello),
- third cycle: Postgraduate studies (dottorato di ricerca or diploma di specializzazione or master universitario di 2° livello),
- both reforms, the HE and the labour market ones, resulted in some positive impact, with some important drawbacks.

2.1. Positive Impact

The labour market reform has had two major positive, widely acknowledged, effects:

² A certain degree of flexibility in labour contracts was already anticipated in 1997 with the ‘Legge Treu’ (196/97), which introduced temporary help work, incentives for part-time contracts, working grants, and the reform of apprenticeship and vocational training.

- it has improved the national levels of employability,
- it has facilitated the emergence of ‘black labour’ which has a particularly high share in Italy.

The new 3+2 system of tertiary education had some positive impact too. After the reform:³

- the mean degree age lowered from 28 to 27,1 years⁴,
- the percentage of graduates under 23 years increased, reaching a 18%,
- the percentage of students with a curriculum delay lowered from 69% (2001) to 52%⁵ (2006). While before the reform only a 7% of students completed the degree without any delay, after the reform, the number of students without delays considerably raised,
 - the number of students spending a stage⁶ period raised from 17% to 58%⁷,
 - the number of people who enrol the University later (after 19 years old) increased, with 7800 students enrolling at 30 years⁸ (indicator of the improved capability of HE to act as a provider of lifelong learning),
 - the number of students enrolling in technical/scientific disciplines raised from 33% to 38%⁹,
 - the number of foreign students (index of internationalization) doubled, raising to a 2,3%ⁿ,
 - an increasing percentage (6,2%) of students spent a period abroad, mostly within the Erasmus/Socrates Eu programmes¹⁰.

³ The earliest first-level degree graduated in 2004.

⁴ Such a trend is even more positive, given that the number of enrollments for students over 30 years old is increased.

⁵ Although the ‘regular’ students have tripled in last years, passing from 10,2% to 34,3%, the 2006 survey shows an interruption such a positive trend. First level regular students shares passed from 52,7% (2005) to 44,8% (2006).

⁶ 80% of stages take place outside the Universities, in public or private companies, witnessing a strengthening of the links between HE and the labour market.

⁷ The stage increases of 10% the chances to get a job in one year after being graduated. The 25% of those who make a stage find a job inside the same company that has offered the stage.

⁸ With a majority of them coming from disadvantaged socio-economic contexts.

⁹ However, such increase is mainly due to medical/health related disciplines.

¹⁰ Having spent a period abroad, the chances of being hired in five years from the degree rise of a 4%. The average period to find an occupation shortens too: 3,6 months against an average of 6.

2.2. Drawbacks

Despite their positive effects, both reforms had serious drawbacks and are now being substantially revised.

The labour market reform has been criticized principally for having improved job precarization to a great extent. Although in year 2006 the occupational level in Italy raised of one percentual point, and the forecasts for year 2007 seem to confirm the same positive trend, the trend in the labour market clearly goes for a continuous decrease of permanent jobs: 2004: 58,4%; 2005: 50%; 2006: 46,3%; 2007 (forecast): 45,4%.

On the other hand, the university reform has been criticized mainly for having been:

- decided centrally with new curricula having to comply with rigid ministerial tables;
- implemented without the necessary extra funding and appropriate labour market demand studies;
- implemented too rapidly, with the consequence of an excessive fragmentation of degree courses, too many classes and exams;

Finally, and most importantly, although the recent university reform was primarily addressed toward shortening the school-to-work transition, the outcome has been unsatisfactory, given that the 80% of the three-year graduates go on to take a postgraduate degree.

In summary, the main objection to both reforms is to have achieved weaker-than-expected effects with respect to the original goals of improving employment rates, support economical development and offer better jobs, especially for young graduates.

2.3. Corrective Actions

Recently, the actual Italian government is trying to correct the negative effects of the labour market reform, e.g. establishing a limit to the years in which a job can be given temporarily and encouraging companies to call for stable positions by making temporary contracts less convenient than permanent ones (new welfare protocol, 2007).

The Ministry of University adopted a set of corrective actions to the reform as well:

- to avoid dispersion and segmentation, a maximum of twenty classes (and exams) for the first level degrees has been established;

– to improve flexibility the number of mandatory courses (classes fixed centrally, by the Ministry) have been reduced from two thirds to 50% (the other 50% of courses can be decided locally, by the single Faculties).

3. Themes

This article is aimed to clarify three main issues, namely:

- how the concept of a ‘knowledge-based society’ is understood at the level of the different EU member states,
- the identification of the (new) social risks which are accompanying the transition towards the ‘knowledge-based society’,
- the identification of both the actual and the possible roles that Higher Education plays in facilitating the transition to a European knowledge society.

The above mentioned three themes will be the subject of the next three paragraphs.

3.1. Discourse Knowledge Economy

„The idea that a new, knowledge-based economy is emerging has been like a new tennis ball – fuzzy, but with a lot of bounce” (Stewart 2001).

While the concept of knowledge-based economy was born around the 1960–70, in the USA, the concept gained a new popularity in Europe in the 1990s, having received a strong support from OECD experts¹¹ (Godin 2006). Beside labour, capital, and energy, knowledge is assumed as the primary production factor that can explain long-term growth (OECD 1995 – quoted in Godin 2006). The drivers for the knowledge economy are often recognised in globalization, high intensive knowledge work, and ICTs. While some reports and studies assume that it is possible to identify some specific productive sectors as knowledge-intensive ones (e.g. OECD 1996; Brinkley and Lee 2007), other authors harshly criticized such a view. “[...] if we accept the idea that modern economies are in some sense more knowledge-intensive, this does not necessarily mean that only some sectors are the bearers of the new knowledge economy [...] the growth trajectories of the advanced economies rest as much on such sectors as engineering, food, wood products, vehicles¹² and so on, as on

¹¹ See the discussion on National Innovation Systems (e.g. Cowan and van de Paul 2000).

¹² „many products embody IT now which only 20 years ago were purely mechanical. An electric razor, for instance, contains between 500 and 1.00 lines of software code. An automobile contains many more” (Cowan and van de Paul 2000).

radically new sectors, as ICT or biotech. ICT has of course grown rapidly, but from a very low base [...] Growth within the less glamorous sectors is certainly innovation-based, and moreover it rests on complex and deep knowledge bases, which from time to time are subject to discontinuous change” (Smith 2000).

3.1.1. Evidence from Interviews

At a national level, the interviews highlighted the following issues about the perception of the concept of Knowledge Economy in Italy:

- Knowledge has always been a **critical resource for any economy, in any historical period**. The diffusion of ICTs has heavily facilitated its reproduction and communication, so that a resource that was scarce in the past has become nowadays abundant and accessible. The deployment of such a diffuse resource depends on the transfer of appropriate skills to the population¹³, and HE have a role especially in teaching the interdisciplinary and interpretative ones.

- The Italian system is **slow** in adapting itself to the new context and to the new economy. The delay mainly depends on the fact that both the public and the private **investments in HE and R&D are very low**. Such low investments, in turn, are caused both by the negative economic trend, and by the fact that 80 to 90% of Italian companies are small-medium ones, with scarce vocation and resources for innovation.

- The positive value of the concept of knowledge economy resides in its focus on **innovation through human capital development and continuous upgrading**. The Italian production and HE systems should speed up their change process, not to loose the chances provided by ICTs and innovation.

- Knowledge **workers are those people whose activity focuses on innovation**. The category is a transversal one, being not rigidly restricted to a limited set of economic activities.

- The competencies required by a knowledge-based economy (thus the competencies of knowledge workers) consist of a **balanced mix of technical skills and relational/entrepreneurial skills**. While HE has always provided technical competencies, it is hard to think that it could supply the second ones, which are mainly acquired through relevant experiences in the cultural and work context.

¹³ „The key competencies for the knowledge economy seems to be [...]: creativity; the ability to communicate in ways in which lead to action on the part of the listener; the ability to form and manage productive relationships with other people; enterprise (not just inventing something but being able to ‘sell’ it)” (Coppen 2002).

– Policy makers should accompany the change by identifying, stimulating and supporting knowledge-intensive companies and promoting the upgrade of individual competencies.

3.2. Perception of (new) Social Risks

„The chief new social risks emerging in the sphere of paid work are three: problems in entering the labour market, problems in maintaining stable, secure, and reasonably well-paid employment and associated social security entitlements and problems in gaining adequate training in a more flexible labour market. [The changing labour market] has tightened the link between education and employment. This in turn affects the risk of social exclusion among those with poor education” (Taylor-Gooby 2004).

In a knowledge-based economy low rates of graduates increase the risk of unemployment which, in turn, leads to social exclusion. Such problem is particularly critical for Italy, which is one the EU countries with the largest public debt and a number of socio-economic negative indicators. The Italian system (Tiraboschi 2006):

- has a rate of young unemployment 17% higher than the average for OECD countries,
- has the longest school-to-work transition of the OECD countries,
- has a population of students who complete their higher education considerably later than other European countries (27–28 years, compared to an average of 22.23),
- has investment in training and education and levels of lifelong learning among the lowest in Europe¹⁴ (see also Brandi 2006).

3.2.1. Social Inclusion Variables in Italy

Social inclusion refers to actions that counter social exclusion, being often linked with the discourse on equal opportunities. Social exclusion refers to the difficulty for some segments of the population to gain access to the opportunities offered by the society they are living in, failing to have a chance to

¹⁴ Only one out of five Italian workers takes part at training courses (against an EU average of 40%). Only the 25% of Italian companies offer some kind of training (against an EU average of 60%) (Isfol 2006).

realise their full potential. A recent report (EU-RA 2006) recognise social exclusion as a function of eleven different variables:

- *gender*;
- *age*;
- social-economic background;
- *income*;
- educational attainment;
- *occupation*;
- industry (branch of economic activity);
- labour force status;
- geographical location;
- minority groups;
- students with special needs (e.g. the disabled).

Although in the knowledge economy a university degree is a protection against social exclusion, the above mentioned variables have an influence on graduates (or on chances to graduate) too. In the following paragraphs, the Italian context is analyzed with respect to some of the former variables that determine social exclusion and/or reduce the chances of the younger to express their full potential.

3.2.1.1. Gender

In a survey of 58 countries, the World Economic Forum found that Italian women rank 48 for the degree of participation to institutional life, and 51 for the degree of participation to the labour market¹⁵.

Although 60% (increasing trend) of the university population are women, one year from getting their with first level diploma they:

- earn 27% on average less than men,
- succeed in getting a permanent position only for a 34% share (48% for males),
- are actively looking for a job in 8 out of 100, versus 5 of 100 men (8% gap: after five years, the gender gap is still equal to 9%),
- enter in the labour market in 6,2 months on average (5 months for men),
- tend to find lower organizational positions than men,
- tend to work less hours than men (6 hours per week less on average).

¹⁵ The objective fixed in the Lisbon Conference is 60% of women actively involved in the labour market. Actually, in Italy, the figure is lower than 45%.

3.2.1.2. Occupation

Although the recent university reform was primarily addressed toward shortening the school-to-work transition time, which is now six months on average, the outcome has been unsatisfactory, mostly because the 80% of the three-year graduates go on to take a second level degree. One year after the degree, the 45% of post reform students find a job (7 points less than with the old system)¹⁶, with a consistent share of graduates who both have a job and decide to prosecute their studies.

Entry wages¹⁷ lowered and the proportion of young graduates holding high level positions is severely decreasing¹⁸ too. One year after the first level degree the mean wage was 1042 in year 2005 and lowered to 969 Euro in year 2006, with a drop of 7%. Even when the wages raised (this is the case for the pre-reform graduates who raised their wage of 4,7% between 2005 and 2006), in the medium term, the real wage decreased¹⁹. The wage advantage of an HE degree compared with an high school diploma is lessening more and more: in the last for years, it went from 2500 Euros to 1815 (minus 25%).

On overall, occupational stability is more and more difficult to be reached both when measured one year and five years from the degree. In 2004 the 40% of those with a first level degree and an occupation had a permanent position, in 2005 there was a sensible drop, with only 32% with a permanent job. In one year after the degree, the number of permanent jobs dropped from 34% in 2001 to 26% in 2006. Finally, the share of workers who find an underqualified job is growing: 3,7 million of workers fail in finding an occupation aligned with their studies, and many of them are university graduates (Istat 2006).

¹⁶ Three graduates out of four find a job in the service sector, one out of five in industry, and only 1,6% in agriculture.

¹⁷ The main driving motivations for job search are the following three: professionalization; stable position; career and wage.

¹⁸ For example, the mean age of upper level university professors is increasing. The median age for full professor in 1997 was 57 years, 59 in 2005; for associate professor it was 51 in 1997 and 58 in 2005. More generally, the presence of people aged less than 50 years in the social elites passed from 23 to 19% in the period 1998–2004, while people over 60 years old passed from 45 to 54% (Livi Bacci 2005).

¹⁹ Between years 2001 and 2006, the wages of young graduates with one to two years experience lost the 8% of their purchasing power. OD&M, Job24 and Sole 24Ore: „Ottavo rapporto sulle retribuzioni in Italia 2007”. Bergamo, 2006.

3.2.1.3. *Geographical Location*

The problems related with geographical location historically affect the southern part of Italy: 20% of southern young people enrol in centre Italy universities, and 9% in northern ones. Only 3,5% (against a mean of 6,2%) of southern students spend a period abroad (Socrates/Erasmus). Southern students tend to prosecute their curriculum more than northern ones. 41% of southern students find a job within one year after the degree, against a 64% of their northern colleagues. After five years, the north-south gap is still of 10 percentage points. The mean period for finding a job is 8 months for southern graduates, against 4 months for their northern colleagues.

3.2.1.4. *Disciplinary Areas*

62% of the overall student population in Italy actually enrol in Humanistic and Social Sciences, with the other 38% enrolling in Technical and Scientific Sciences. The students of the Humanistic and Social Sciences tend to prosecute their curriculum after getting a first level degree more than their colleagues of Technical and Scientific Sciences. One year after the degree, the graduates in Medicine, Economics, and Statistics have the upper wages, while the graduates in Psychology, Geography, Biology and Literature have the lowest ones (below 800 Euros). The graduates in Engineering have the highest rate of employment (76% one year after the degree). One year after the degree, 60% of the graduates in Technical and Scientific Sciences find a job, against a 49% of the graduates in Humanistic and Social Sciences²⁰. Architects, engineers, chemists, agricultural experts, pharmacists, physicians, and lawyers are those who have more chances to find a permanent job. The overall perceived **quality of the job** is good (85 on a 0–100 scale) for those with a medical degree, worse (50–54) for those with a psychological, literary, and geo-biological degree.

3.2.1.5. *Social-economic Background*

73 out of 100 graduates come from parents who didn't hold any HE degree. However, even after the reform, students coming from the upper classes continue to be overrepresented²¹. Those with a higher socio-economic background tend to prosecute their studies longer than those with a lower status (14% more).

²⁰ Such initial gap is zeroed in the medium term: Five years after the degree, 84% of the graduates in Technical and Scientific Sciences find a job, against a 48,6% of the graduates in humanistic and social disciplines.

²¹ Even if a recent paper (Checchi 2003) shows that it's not the family income *per se* that prevent educational attainment, but: „cultural constraints' seems a more appropriate description of the problem of Italian tertiary education than 'liquidity constraints'”.

3.2.2. Evidence from Interviews

The interviews highlighted the following issues on the perception of (new) social risks in the era of the knowledge-economy in Italy:

- The **groups more exposed to risks of social exclusion** are considered the following: women, people located in southern Italy, young, first-level graduates, and those with scarce linguistic/informatics skills.

- The Italian context is characterized by the late entrance of young graduated in the marketplace. Such a late entrance extends the **dependence of young people from their families**²². In Italy, where a serious and substantial welfare policy is lacking, with scarce chances of life learning initiatives targeted to those who have lost their job or have difficulties in selling their competencies to the labour market, the family continues to remain the only shelter²³.

- The permanence in the family setting, which is also caused by the precarization of jobs, a general decrease in entry wages and high costs of housing, **doesn't allow people to develop the network of relations**²⁴ that is critical to find a job, exchange experiences and develop self-initiative.

- While people with Scientific and Technical grades, or specialistic ones (such as dentistry, physiotherapy, etc.) generally succeed in achieving a job corresponding to their curricula, those with **Humanistic and Social grades** have more difficulties.

More funding should be allocated to **encourage mobility and international exchanges for those students with limited economical resources** to take advantage of the chance of spending a six-month period abroad.

The **July 2007 welfare protocol** (recently signed by the social parts) could be of some help in contrasting social exclusion, given that it: promotes new ways to support the unemployed; discourage the adoption and extension of temporary contracts; enforce employment services; defines new standards for apprenticeship.

²² The economical status of young Italian people is comparable to that of their European colleagues, mainly because of the money that is provided by their parents (out of a total of 100 Euros, young Italian people of 15–25 years old receive 74 Euros from their families, against an European average of 52) (Livi Bacci 2005).

²³ Between 25 and 30 years old, the 68% of men live with the family (24% in Germany, 18% in France; 13% in England). Italian women still living with parents: 46% (19% in France; 10% in Germany; 6% in England).

²⁴ In Italy, which is characterised by an absolute majority of small companies, the recruitment mostly takes place by word-of-mouth and through social networks (Ministero del Lavoro, Sistema Informativo Excelsior – elaborazione dati Unioncamere, 2005).

3.3. Role and Functions of Higher Education

As already stated, one of the main functions of higher education is to improve the employability of young people given the fact that: „in general the only employment categories that are rising across OECD economies are those for people with higher education” (Smith 2000). However, it’s quite evident that „Italy appears to be a long way from reaching the objectives of the Lisbon strategy, that is to say to enable education and training to be of world-class quality by 2010, but also ill-equipped to make its institutions of higher education the preferred destination for students and researchers from the rest of the world” (Tiraboschi 2006).

How should the role and functions of the Italian University evolve to contribute to reach the target for the country (and Europe) to become „the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion” (European Commission 2003)?

„The self-referential nature of the teaching body is undoubtedly a problem in the Italian universities [...] in general the Italian higher education system runs programmes that tend not to reflect the needs of enterprises and the surrounding territory but above all the teaching interests of the various faculty members” (Tiraboschi 2006). There’s the strong need to enforce links between enterprises and universities, through placement services and liaison offices, given that the knowledge produced at universities and taught to students risks to be ‘knowledge for knowledge’s sake’ „with less concern for the ultimate use to which science will be put [instead of being] carried out in the context of application, shaped by a diverse set of intellectual, economic and social interests” (Harloe and Perry 2005). Finally, although the recent reform has lowered the rate of students who don’t complete their curriculum in the due period, there’s still a lot to do to reduce graduation delays, given that at one year of courses still corresponds 1,49 year of permanence inside the university.

3.3.1. Evidence from Interviews

The interviews highlighted the following issues on the role and functions of HE in Italy in the era of the knowledge-economy:

- HE should be primarily seen as places more devoted to skill transfer (teaching) than innovation (research). The University should be the primary place of:

– production and accumulation of human capital and up-to-date, **market-ready professional profiles**²⁵.

– A special and increased attention should be devoted to low-income people, to promote social mobility and inclusion.

– The 3+2 system has not yet been fully deployed/received by Italian employers. Sometimes the shorter permanence in the HE system is perceived as an insufficient qualification, which is not balanced (sometimes even worsened) by the younger age of the applicants. There is evidence that, to some extent, Italian companies prefer to hire young people with a diploma or people with a master degree. Even worse, many professional bodies still require a five-year degree to subscribe new members.

– The dialogue between HE, public institutions, companies and unions should be strengthened to renew both the academic curricula and the pedagogical models in use.

– After a frantic period which saw the proliferation – to some extent arbitrary – of new courses, the new educational offer has to be fine tuned to match the real needs of students and of the labour market.

– There's still too many students who fail to get their degree on time, even in the three-year cycle.

– The Italian HE system should go for the UK/US like recruitment system, to reach the goal of hiring only motivated and high level teachers.

– Stages, placement offices, and students' mobility (e.g. Erasmus Programme) should be heavily enforced. The chance to spend some time abroad and/or working while studying is still underestimated in its importance. Students still tend to share the idea that the most relevant issue is to finish as soon as possible their course.

– The advent of the knowledge economy calls for high skilled workers, having a strong sense of autonomy and self initiative, with interdisciplinary skills and relational abilities. Interpersonal, entrepreneurial and transversal skills are acquired through experiences: **Universities should stress and value the relevance of practice.**

– The fact that the University in Italy is publicly funded and thus relatively cheap has the drawback of too low funding levels, scarce contacts with the marketplace, and scarce competition among institutions.

²⁵ Although this is the prevalent view of the interviewees, the tension between universities as professional makers bodies versus cultural bodies is far from being resolved.

– Teaching should be more innovative, flexible, open and pragmatic. The frontal, unidirectional, lesson should be progressively abandoned in favour of case-based lessons, actively participated and performed by scholars. The teacher's role should evolve in the direction of the professor as a guide, or tutor, who encourage and direct students through the discovery of the discipline, taking advantage of the easy direct access to knowledge sources that is granted by the digital media.

– Universities should be able to directly recruit their teaching staff, and: have more flexibility in defining their courses to match the local needs of the territory; reduce redundancies in the educational offer; adopt English as the teaching language, at least in a percentage of classes; encourage interdisciplinarity and cross-disciplinary projects.

Universities should solve the researcher/teacher tension by offering the possibility to **go either for one or for the other job/career**²⁶.

4. Conclusions and debate

In conclusion, from the analysis and the interviews that have been performed in this text it emerges that the concept and the importance of knowledge economy is well acknowledged and recognized. However, the country is slow in exploiting the chances offered by the recent transformation. Although the benefits of education still persist, young graduates still suffer from too long curricular delays, mismatches between contents of degree courses and needs of the labour market, job precarization and decreasing income. HE institutions should primarily renew themselves to better fit the socio-economic local needs and reduce social inequalities which mainly interest women, people located in southern Italy, young, first-level graduates (especially those attending to Humanistic and Social degree courses). Universities should be the primary place of promotion of social cohesion through an increased 'workfare', that is through the production and accumulation of human capital and up-to-date, market-ready professional profiles. The positive trend of attracting adults in tertiary education, thus promoting lifelong learning, should be further encouraged, e.g. implementing distance learning degree courses. Stages and

²⁶ The Italian university teaching staff is structured in three levels. The lower level is the 'researcher' position, the intermediate one is the 'associate professor' position, and finally the highest level is the 'full professor' (Professore Ordinario) one. Although the naming suggest that the lower position should be concerned exclusively with research and the other upper two with teaching, all three levels are mostly occupied with teaching (with some relevant differences among faculties).

international experiences (e.g. Erasmus programme) should be enforced too, given that these are the primary contexts in which young people could learn those transversal skills (autonomy, interpersonal competence, openness, etc.) that are awarded in the knowledge economy.

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Karsten Krüger, Laureano Jiménez, Violeta Piqué

Department of Human Geography, University of Barcelona, Hiszpania

Higher Education in the Spanish Transition to a Knowledge Society

SHORT DESCRIPTION

The article reviews the Spanish debate of the Knowledge society, new social risks and universities, arguing that it is dominated by the technology paradigm of the concept information society. Knowledge society is perceived as the next step in the socio-technological development conceived as a scientific based information society. In this conceptual line, the Spanish governments and the governments of the Autonomous Regions had put in action several programs to promote the information society”, which doesn’t reduce significantly the differences to other EU-countries. This is complemented in the last years by efforts to resolve traditional problems of the Spanish SSJ system, which has its weak points in the insufficient founding, the weak links between public and private research and weak private innovation capacity. The weak S&T system has its reflection in an insufficient capacity of the Spanish labour market to absorb the growing number of graduate workers and the precarisation of their work conditions. In this context, the Spanish Bologna process seems not the most adequate measure to give response to the problems of the transition to the knowledge society, but as a measure to assure a higher integration in the European Area of Higher Education. The Bologna process has in Spain two main focuses: the redesign of the academic titles and curricula, but also the innovation of didactical methodologies and practice discussing new concepts of academic education and training and more interdisciplinary organization of the learning and teaching activities.

1. Introduction

The concept „Knowledge based society” occupies a prominent place in the actual social-political discussion in Europe and of course also in Spain. In the discussion of the transformation of the European society different terms has been introduced as e.g.: knowledge society, network society, knowledge economy (or knowledge based economy) and information society. A search for these terms in the Internet using the search engine „yahoo.es” gives first indicator of their relevance in the Spanish discussion. The results (see Table 1) indicate that the term „information society” is the most relevant, followed by „knowledge society”. The two other terms have only a residual relevance in quantitative terms. However, the following exposition dedicates special attention to the notion „network society” taking into account that one of the worldwide promoters of this concept is the Spanish social scientist Manuel Castells, who exercises a considerable influence on the Spanish debate.

Table 1

Internet search for relevant terms at the search engine “yahoo.es”

“sociedad del conocimiento”	705 000 (14,4%)
„sociedad red”	118 000 (2,4%)
„economía del conocimiento”*	185 000 (3,8%)
„sociedad de la información”	3 880 000 (79,4%)

* Note: For the search, the following alternative Spanish terms has been used. “Sociedad del conocimiento” and “sociedad basada en el conocimiento”; “Economía del conocimiento” and “Economía basada en el conocimiento”.

2. The Spanish KBS-Discussion

The Spanish Discussion of the KBS has many similarities with the one done at the European Union level. It started with the discussion of the information society and it is changing now to the use of the term „knowledge society. The concept „network society” is used in the Spanish debate as an alternative term to knowledge society.

2.1. Information Society

In Spain, as in other countries, a central aspect of the debate lays on the technologies of information and communication (ICT’s) and turns around the

term „information society”. The „information society” arrives with the technological innovation and when it is fully developed it will convert in a knowledge society (see Chereguini (2007). In other words, the transformation of the actual society is technological driven: the result of the massive application of the modern ICT's.

The Foundation Telefónica, one of the several foundations working on the implementation of the Information Society in Spain, uses similar reasoning. Starting in 2000, they publish an annual report about the progress towards the information society. Taking as a starting point the different definitions proposed by Yoneji Masuda (*La sociedad informatizada como sociedad post-industrial*, Tecnos 994), Raúl Tejo Delarbre (*La nueva alfombra mágica*, Fundesco 996) Julio Linares *et al.* (*Autopistas Inteligentes*, Fundesco 995) and Manuel Castells (*La era de la información* 998), the report of the year 2000 proposed a definition of the term „information society”: The Information society is a state of development characterized by the capacity of its members (citizens, enterprises and public administration) to obtain and share immediately any information from any place and in the preferred form.

The reports of the Foundation Telefónica started from the assumption that the industrial society has first transformed to the post-industrial society, where the activities of the service sector have gain more importance than the industrial activities. The European society is actually in the phase of the post-industrial society. The next step of transformation will be towards the „information society”, in which the people have not only access to tangible products and intangible services, but also an unrestricted technological capacity of access to resources of information and to information. This new technological capacity will provoke social transformations, which will change profoundly our societies.

This will imply new forms to organize the economy and the society. As the introduction of cars changed the modern societies and the ways in which the persons act, also the modern information and communication technologies will transform the actual societies: the patterns of action, the norms, the values, the social culture and the whole society will change. The first report considered that these changes would cause serious improvement in the economy, the way to structure organisations and in the personal life of the citizens. To promote the „information society” it is necessary to invest in technology and to build up an adequate infrastructure.

V. Cuervo (2004: 4) pointed out that there is not a unique definition in use, but all the definitions are based on the fundamental role of the ICT's and the information in the social transformation process. All these definitions are supposing that this technological driven social transformation process will lead to new economic and social configurations.

2.2. Network Society

One of the important keywords of the Spanish debate is precisely „network society” as one of the worldwide experts in this theory is the Spanish author Manuel Castells. According to his hypothesis, the historic superiority of the vertical hierarchical organizations above the networks is due to those social network organizations had to surmount material boundaries, basically related to the existent level of technology. In the past, the emissaries on horseback could hold the communication from the center to periphery of big empires. But the answers arrived so late that the system logic was based in an information flux in only one-way sense. In these conditions, the networks were an extension of the power concentrated in the top of the vertical organizations that configured human history: states, religious organizations, armies, bureaucracy, etc.

The capacity of networks to introduce new actors with relative independence of the power centers, increased with the technologic change, especially with the evolution of the communication technologies, but the first communication technologies based in electricity were not able enough to give autonomy to all the parts of the networks. That means that the availability of the adequate technology is a requisite, but not sufficient for a transformation of the social structure. Only the conditions of the mature industrial society allowed the proliferation of autonomous organization networks. Then, the networks became in the most efficient organization, due to the information and communication technologies changes that took place in 1940's and 1950's. (Castells 2004: pp. 30–31).

Thanks to the available information and communication technologies, the network society can totally spread out, going beyond the historic limits of the former networks. In this sense, Castells moves away from the concept that defines our society as an information or knowledge societies. He considers that as an empiric and theoretical mistake. The reason is that all the societies had been based in information and knowledge as sources of power, wealth and meaning. But the information has no value without knowledge to use it for a particular purpose. And the knowledge is relative to each culture, society and period of time. Therefore, if the information and knowledge had been essential factors to reach the power and welfare in all societies in a historical point of view, we can't, according to Castells theory, designate our society as a knowledge-based or information society.

The maximum expression and evidence of this logic of the network and global society is the Internet (the net of the nets), an open, interactive, dynamic, decentralized, self-governing and creative space that explains the nature of the changes of our environment. For Castells, this new tools are „technologies for

freedom”, specific ways of material progress and access to culture. In the informational paradigm, the capacity of each communicating subject allows to individuals and organizations the possibility of reconfiguring the network according to their needs, desires and projects. This has generated a lot of controversy, because there are authors (e.g. Sierra (2000) who question this „freedom” of the Internet and other technologies. For example, with the emergent networks of decentralization and social cooperation, formal networks of more effective administration and control are reinforced. The new devices are a way of known and transformation as much as a tool of power and control of the society. The unique aspect that Castells recognizes in this sense is that the „capacity of reconfiguration of each subject depends on the power model presents in the network configuration” (2004: 37).

In the Spanish discussion about the network society, the main idea is that theories such this one, tend to abstract the universe of the communication of its historic conditions, gaps, borders, limits and social determinations, supposing an universality that falls, by default, in a way of not very consistent idealism, in such a way that contributes to reproduce the logic of the communication imagined as an undeniable reality.

On the contrary of the Castells idea of the technologies as something undeniable that contributes to a progress and an expansion of the culture, e.g. Sierra (2000: 4) postulates that the production and distribution of the knowledge and the information in this global society entails an unbalanced development of the different means and contents of the communication system. Furthermore, it is causing a centralization of the decisions of the symbolic mediation system and a reduction of the margin of creativity because of productive demands.

The joint action of the ICTs and the expansive and liberal development of the international economic interchanges have favoured the process of global extension of capitalism as a way of production and base of social articulation. This has caused a deep reconstruction of the intellectual world and culture. It bursts into the world of the culture in a creative way and puts in danger the diversity and informative pluralism of the mass media. The free circulation of the information, it's not as free as it seem, as the information that circulates is mostly the one selected by the networks that have the power and the means to put the contents in the global network. Moreover, it must be remembered that only a small percentage of the world populations have access to the Internet and the possibility to receive and distribute information. Then, there is a predominance of a determinate kind of information/point of view.

2.3. Knowledge Society

The concept „Knowledge society” is not so widely used in the Spanish debate as we have mentioned before (see Table 1). Its use is frequently related to the concept of the information society considering the knowledge society as a higher state of the information society. For example, the definition from the web-portal „N-economía” (2007) defines information society and knowledge society as equivalent terms and underpins only its economic aspect.

Other definitions highlight the importance of modern multimedia means for the knowledge society. Their massive application of ICT’s produced the synergy of information and documentation processes. The multimedia revolution prepared the ground for the knowledge society. The messages transmitted constitute a new form of social mediation and will change our patterns of behaviour or action (see Davara 2000). Other authors, arguing in a similar way, pay more attention to the selection of information as a central issue of the knowledge society: to know how to select relevant information in the ocean of information provided by the modern communication and information technologies is necessary to avoid a permanent state of disinformation (see Díez Gutiérrez 2007).

Also E. Lamo de Espinosa (2001) underpinned the importance to know to how to select relevant from the irrelevant information. For this reason, the emerging society will not be an information society but a knowledge society. The access to more and more information increments the need of previous knowledge to differentiate the information from noise. This process of differentiation is not information but knowledge based. This is the reason why we must talk about knowledge societies instead of information society. E. Lamo de Espinosa established a similarity to the industrial society, which is based on a better and cheaper access to energy. What has been the energy for the industrial society is no the information. Based on the even more cheaper access to information, new kinds of fabrics can be created: the knowledge fabrics – the universities (Lamo de Espinosa 2001: 9). This argument induced a specific understanding of the knowledge society. When this author argues that the cheapness of the information allows the creation of a new type of fabrics: the universities as knowledge factories, he promotes the understanding of knowledge society as a science society.

M. Castells is arguing in a similar way. Starting from the assumption that in all known societies information and knowledge has been a decisive factor for the social structuration, he proposed a more practical use of the notion. Castells talks about a socio-technological transformation as the basis of the „knowledge society”. The generation of knowledge and the processing of information have been radically changed by the modern technologies. In spite of that, the

technology never determines the social development, the modern communication and information technologies are promoting a new paradigm of society, which impregnates all social processes. This new technological paradigm has two main pillars: the communication and information technology, especially the Internet, and the other is the biotechnological science (e.g. genetics ...). The notion „knowledge society” is describing a double information revolution: electronic and genetic. But both are interacting, so that we can talk about just one revolution in all information areas (Castells 2006).

M. Esteban (2002), coming from the educational sector, proposed another understanding of knowledge. He based his definition on the proposals of the UNESCO and European Commission about knowledge society and learning society. The knowledge society is based on learning, which means a permanent up-dating of the once acquired knowledge.

Resume

Our brief description of the Spanish debate of the transformation of the European society shows that it is dominated by the concept of the information society. The knowledge society is seen as a quasi-natural evolution of the information society once the required technological infrastructure is created and available. The actual transformation processes are perceived as technological driven.

Also, the concept of the network society continue the technological driven paradigm of the Spanish debate. Although M. Castells insists that there is no technological determinism and the use of a technology depends on the social context, he didn't ask for the social construction of the technologies. However the concept of the network society asks more for the social consequences of the application of the modern ICT's and for the possibility to regulate the social use of the technologies to stimulate the social progress of the societies.

The debate of the concept of „knowledge society” has two main pillars: on the one side it makes reference to the European political debate as it is reflected in the strategies around the Lisbon declaration. This strand of the debate highlights the importance of learning, more specifically the lifelong learning, within the process towards the knowledge society. The second pillar of the debate insists in the relevance of the scientific knowledge for the new type of society arguing that the scientific/technological knowledge is going to be the new main competition factor.

3. Political Actions

3.1. Political Strategies Towards the Information Society¹

The Spanish politics towards the information and knowledge society are framed within the European strategy, which has been the answer to the programmes launched by the US-Government at the beginning of the 1990's. However there have been former initiatives to resolve the historical problem of the Spanish delay in the information sector, as for example the creation of the *Subdirección General de Documentación e Información Científica* (General Sub-direction of Scientific Documentation and Information) in 1982. They launched one year later the „*Plan Nacional sobre Información y Documentación*” (National Plan of Information and Documentation – IDOC). A preliminar initiative was the so-called „*Ley de la Ciencia*” (Science Act) elaborated by the Spanish Government in 1983. Specific actions were done between 1988, and 1991 to impulse the technological innovation and development. One milestone of this strategy was the „*Planes Nacionales de I+D*” (National R+D Plans).

The publication of the White Paper: „Growth, Competitiveness and Employment. The Challenges and Ways Forward into the 21st Century” in 1993 initiated the European strategy towards the information society and changed also the Spanish politic in this domain. Besides the implementation of the EU-directives, this document pushes the design of own strategies in the information sector and of strategies to promote the information society in Spain. So in 1998 the Government approved a Telecommunication Law to regulate the sector. In 1999, the first serious step towards the Information Society was done by the creation of the „*Comisión Interministerial de la Sociedad de la Información*” (Interministerial Commission of the Information Society). In this commission were all ministries, except the Ministry of Defence. The objective was to establish a strategic plan to promote the Information Society and coordinate the actions with the Autonomous Regions.

A result of the work of this commission was the „Plan Info XXI” presented by the Government in 2001. The outline of the plan was in the line of the programme e-Europe and of the Lisbon strategy, and contains the following strategic threads: a) to finalize the liberalisation of the sector of telecommunication promoting the competition between enterprises; b) to strengthen the electronic administration; and c) to improve the general access to the technological means of the information society. The „Plan Info XXI” had

¹ The description of the politics until 2004 is based on Córdoba & Sanz Domingo (2004).

duration of three years (2001–2003) and a budget of around 5000 million! Nevertheless, during 2002, the Government recognized that the „Plan Info XXI” didn’t work well, except in the area of electronic public administration. In this area the electronic payment of taxes, the Legislation on Services of the Information society and of Electronic commerce, the electronic identification of the farm animals and the Portal for Citizens as the communication link between citizens and public administration were developed. In 2002 the Spanish Government presented a new action plan „*Internet para todos*” (Internet for all) within the Plan Info XXI. The objective was to facilitate the access to the Information Society to the citizens and the enterprises, reinforcing the broadband and providing training to use the modern technologies.

In 2003 the Government approved a new programme called „España.es”. This new programme was a bundle of actions and projects to give impulse the development of the information society in Spain. This programme was previewed the years 2004–2005 with an initial cost of 1029 millions of Euros. 63% of the budget would be provided by the state, 26% by the autonomous regions and 11% by the private sector. „España.es” includes key actions oriented to the electronic public administration, the digital training, the implementation of ICT’s in the SME’s, information campaigns for the citizens and the promotion of the development of digital contents by enterprises.

In March 2004, a new government came in charge. As the programme „España.es” was in action for the years 2004 and 2005, the new government entitled the elaboration of a document to design a new programme. One of the main results of the report was the correlation between the investment in ICT’s and the productivity growth. For this reason, the *Plan 2006–2010 para el Desarrollo de la Sociedad de la Información y de Convergencia con Europa y entre Comunidades Autónomas: Avanz@*² (Plan 2006–2010 for the Development of the Information Society and the European Convergence and between the Autonomous Regions: Avanz@) was mainly oriented to the improvement of the competitiveness and the productivity. Other aspects covered by „Avanz@” are the social and regional equality, the universal accessibility and the improvement of the welfare and the quality of life of the citizens. The objective was that the volume of the economy related to the ICT’s achieves around 7% of the GDP in 2010. In 2006, 1197 million Euros were spent in the plan and 1500 million Euros are reserved for 2007. The plan was started through bilateral agreement with the Autonomous Regions.

In spite of the different plans to promote the Information society in Spain, the statistical data indicates a certain delay in the implementation of the

² The plan was approved in November 2005 and started at the 1st of January 2006.

corresponding technological solutions. In the following, we present only some basic indicators, which illustrate the situation in comparison to other countries: household with access to Internet (Table 2); households with broadband access to the Internet (Table 3) and the regular use of the Internet (Table 4).

Table 2

Households with Internet access by country in the period 2002–2005 in % of the households)

	2002	2003	2004	2005
EU 25			43	48
EU 15	39	43	46	53
Germany	46	54	60	62
Spain		28	34	36
Italy	34	32	34	39
Hungary			14	22
Netherlands	58	61	65	78
Austria	33	37	45	47
Poland			26	30

Source: EUROSTAT consulted by the Spanish National Statistic Institute (www.ine.es).

Notes: 1. All kind of Internet access is included. 2. Taken into consideration the population between 16 and 74 years old.

Table 3

Households with broadband access by country and year in % of the households

	2003	2004	2005
UE 25 (25 countries)		15	23
UE 15 (15 countries)		17	25
Germany	9	18	23
Spain		15	21
Italy			13
Hungary		6	11
Netherlands	20	31	54
Austria	10	16	23
Poland		8	16

Source: EUROSTAT consulted by the Spanish National Statistic Institute (www.ine.es).

Note: A household has at least on member, who is between 16 and 74 years old.

The data of Eurostat corresponding to the period 2003–2005 indicates a positive evolution in Spain with respect to Internet access from the households. But Spain is still far away from the EU-25 average. The difference to the average has increased between 2004 and 2005 from 9% to 12%.

We can observe a similar trend with the broadband access to Internet by household. The number of household with this type of access has increased 6%, but the difference to the EU25 has also increased in the same period.

The data about the people, who use regularly Internet, indicates again the same trend. The percentage of persons increased in the period from 2003 to 2005, but also the difference to the EU25 has increased 1% between 2004–2005.

Table 4

People who use regularly Internet in the period 2003–2005 in % of persons between 16–74 years

	2003	2004	2005
EU 25		38	43
EU 15	38	41	46
Germany	44	50	54
Spain	29	31	35
Italy	25	26	28
Hungary		21	34
Netherlands			74
Austria	36	46	49
Poland		22	29

Source: EUROSTAT consulted by the Spanish National Statistic Institute (www.ine.es).

Notas: Regular use is if the person uses the Internet once a week (in the last three months).

3.2. Strategies Towards the Information Society in Research

The „Plan Info XXI” didn’t paid specific attention to the Universities and the Higher Education. The promotion of the Information Society in the University and Higher Education was integrated in the different National Plans of R+D. For example, the technological innovation has been one of the priorities of the „III Plan Nacional de I+D 1996–1999” (National Plan of R+D), but also of the „Plan Nacional de Investigación Científica, Desarrollo e Innovación

Technológica” (National Plan of Scientific Research, Development and Technological Innovation), which was approved for the period 200–2003. This plan includes a specific action area dedicated to the Information Society and three related areas of science and technologies: Technologies of Information and Communications”; „Design of the Industrial Production” and „Socio-economy³”.

The National Plans of R+D+I of the years 1988–91, 1992–1995, 1996–1999 had had a specific part dedicated to the Information and Communication technologies. In these two plans the possibilities of funding were aggregated in three groups:

- Technologies made reference to the hardware in the areas of radiofrequency, optic, electronic and microelectronic, but also to related technologies as Communications.
- System and Architecture made reference to the software, which are included in the technologies mentioned in the previous group.
- Integrated Projects made reference to projects in which different kind of actors are participating to develop technologies, systems or architectures with a clear customer and market orientation. This kind of project has appeared firstly in the National Plan 1992–95.

Additionally, the National Plan 1996–99 included a part dedicated to the telematic applications and services. The eight years before the „*Programa Nacional de Tecnologías de Información y de las Comunicaciones*” (National Programme for Information and Communication Technologies) are covering this issue. From 1996 on, the National Plan of R+D+I covered this aspect. The plan 1996–99 is devoted mainly to the contents called „Information highways”. This specific programme put the attention to three basic aspects:

- The development of telematic services and application related to the provision, acquisition, search and access to information: for example virtual libraries, virtual archives, virtual museums, virtual education, telework, etc.
- The development of technologies for communication networks to support these services and applications.
- Horizontal actions to promote the practical implementation of project results. The National Plan 1996–99 is specially focused on the Science-technology-Industry system. In this sense, it was a horizontal programme, which proposed a more coherent articulation of all the mechanism of knowledge transfer previewed also in the former National Plans. It proposed additionally also new mechanisms of knowledge transfer.

³Tecnologías de la Información y de las Comunicaciones”, „Diseno de Producción Industrial” and „Socioeconomía”.

The National Plan 2000–2003 has a new structure differencing between a science-technology area and a sectorial area. In both areas, the ICT's is present. In the science-technology area, a specific topic has been dedicated to the Information and Communication Technologies. This area has the general objective to generate scientific-technological knowledge and the development of technological innovations to facilitate the penetration of the ICT's in the Spanish society and to contribute to the improvement of the efficiency and competitiveness of the Spanish enterprises. The main issues covered are:

- A mayor mobility within the communication infrastructure and services.
- The improvement of the broadband infrastructure.
- The improvement of the access to information in the Internet and its management.
- The improvement of the functionality and flexibility of the software.
- The promotion of functional modules and components inserted in complex systems.
- Experimental technologies and services related to cable networks.

In the sectorial area, a specific area for the Information society was created. Its objective was the development, validation and diffusion of technological applications for the Information society in four sectors: education and culture, public administration, services for enterprises and health.

The National Plan 2004–2007 established nine priority areas (see McyT 2003). One of these area is Technologies of the Information society, which include 3 specific programmes:

– The National programme for electronic and communication technologies. It „covers radio communications and antennas, signal processing, mobile and satellite communications, optic communications and broadband networks and telematic and audiovisual applications.” (MCyT 2003: 102).

– The National Programme of computer technologies devoted „to automate and represent processes, knowledge and information via design, construction and implementation of hardware and software based on digital technology” (MCyT 2003: 105).

– The National Programme of Information society service technologies „seeks to identify capabilities and possibilities offered by new technologies” (McyT 2003: 107). It has a practical orientation in benefit of the citizens and the enterprises. The programme has the following priorities:

- e-business,
- e-SME,
- e-training,

- e-administration,
- e-home,
- e-inclusion,
- e-care.

Also the new National Plan 2008–2011 previews an area dedicated to the Telecommunication and the Information society. In this case, they are defined together as a strategic area. This area includes the following thematic sub-areas:

- Computing technologies.
- Equipment, systems and services of Telecommunication.
- Electronic and dispositives.
- Safety Technologies.
- Context (infrastructure, security and contents).
- Public digital services.
- Citizenship, which includes the aspects of diffusion and dinamization of the Information society, gender equality in the information society and programs of e-inclusion.

Applications, services and sectorial contents, which includes the following thematic areas:

- Enterprises, especially SME's.
- Health, care services and social inclusion.
- Food, agriculture and biotechnology.
- Security in the broadest sense of the term.
- Transport in the broadest sense of the term o Energy.
- Tourism.
- Telecommunications.
- Education, Health and Justice.

This new National Plan of R+D+I is framed in a more ambitious programme called „Ingenio 2010”, aimed to fulfil the objectives expressed in the Lisbon strategy. The Programme has the following objectives:

- Achieve in 2010 the 2% of the GDP devoted to R+D, as a step to achieve the 3% fixed in the Lisbon strategy.
- Achieve that the private investment in R+D is 55% of the whole Spanish R+D investment, as a step towards the 66% fixed in the Lisbon strategy.
- Achieve in 2010 the 0,9% of the GDP of the public investment in R+D.

– Insert each year through the programme Torres Quevedo 1300 PhD's in the private sector from 2010 on.

– Increase the number of new technologies enterprise started from public funded research (spin-off). The objective are at least 130 new companies by 2010.

– Achieve the EU average in percentages of the GDP devoted to the ICT's (7% in 2010).

– To achieve this objectives, „Ingenio 2010” is divided in 3 strategic actions: CENIT, CONSOLIDER and Avanz@.

– The programme CENIT provide mechanisms to promote the public-private cooperation in three action lines:

– The National Strategic Consortiums of Technological Research. This action lines disposes of 1000 million Euros to promote public-private research groups with a long term perspective with in a joint research programme in the areas of biomedicine and health science; food technologies; information and communication technologies; production and design technologies; environment, sustainable development and renewable energies; new material an nanotechnology; sustainable mobility and aerospace, security.

– The creation of a Fund to sponsor the creation of new enterprises. It disposes of a global budget of 200 millions Euros to invest in risk capital.

– Programme Torres Quevedo to contract PhD's and technicians in research projects of enterprises.

The programme CONSOLIDER has the objective to increment the quality of research through 4 action lines:

– CONSOLIDER projects, with a budget of 150 million Euros, to increase the average size of the research groups, improve the funding of the main research lines and avoid the excessive fragmentation of the research. It tries also to promote the participation of the Spanish public research centres in the VII European Framework programme.

– CIBER projects, with a budget of 350 million Euros, is oriented to improve the research quality in the area of biomedicine and health science by the development and enhancement of the research network structure.

– Programa I3, tries to incite and intensive the research activities by incorporation of Spanish or foreign lecturers/researchers in the Spanish Science and technology system, who has a proved research career as well as the promotion of new ideas for projects, which explore the new knowledge areas. Additional, it is previewed to contract lecturers to give the opportunity to dedicate their time exclusively to research. It is also foreseen to extent the social security coverage to all researchers in training.

– The creation of a strategic fund for scientific and technological infrastructure with a budget of 1000 million Euros devoted to the construction of scientific-technological installations in the whole Spanish territory and to update the equipments of the universities. The programme AVANZ@ a budget of 5700 million Euro for 5 years, and a estimated budget from the Autonomous Regions and the private sector of between 20 000 and 25 000 million Euros. Its objective is to converge to the EU-indicators of the Information Society. The indicators to evaluate the success of the programme in 2010 are:

- that 70% of the enterprise with less than 10 employees is connected to the Internet,
- that 55% of the enterprises are using electronic commerce,
- that 40% of the public administration is electronically disposable,
- that each second pupil have a computer connected to the Internet; and
- that 60% of the households have access to the Internet.

Within the programme AVANZ@ four strategic lines has been established:

- Citizens,
- SME's,
- Electronic administration,
- Education.

4. Education and Universities in the Information Society

In 2004, the „Conferencia de Rectores de las Universidades Españolas” (The Conference of the Rectors of the Spanish Universities – CRUE) published a report about the Technologies of Information and Communication in the Spanish University system (CRUE 2004). Taking into account the relevance of this organization for the political strategies in the Higher Education, we take this document as the main reference for this chapter.

The CRUE used exclusively the term „information society” considering it as the adequate term to describe the actual society. They understood as „knowledge society” a level of social development which is characterized by the capacity of the citizens, enterprises, public administration, etc. to generate, distribute and use knowledge in an adequate way using the ICT's and the consequent reduction of the time-space barriers. The Spanish society has still not reached, in the opinion of CRUE, this level and for this reason, they are using only the term „information society”. To achieve the level of the knowledge society it is necessary to incorporate ICT's at all level of the social life. A delay

can have especially dramatic consequences for the Spanish universities causing a competitive disadvantage to other National University system.

The report of the CRUE⁴ tries to analysis the changes in the University caused by the application of the ICT's in the four main functional areas: training, research, its service to the society; and the management and administration of the universities (Figure 1). The application of the ICT's in the training area will produce several effects:

- A trend of time-space disembedding of the training from time and space coordinates. The learning processes do not depend exclusively on the face-to-face contact and the students will have a higher degree of freedom to organize their learning processes.
- A reduction of cost by e.g. avoiding the costs of copying and of travelling.
- Would help the lecturer to follow-up and supervise the activities of the students.

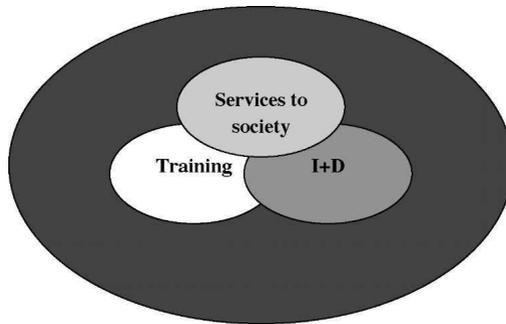


Figure 1. Functional areas of the University.

With regards to teaching, the application of the ICT's will change the position of the students, who could organize more independently their learning processes. It is supposed that the „*modus operandi*” will improve their competences to use the new technologies, which will become an integrated part of the learning processes. In these learning processes, the students will acquire competences, which are also relevant for the professional life in the information society (communication, team work ...). These transformations will change also

⁴ Giddens (1990) defines disembedding as „the removal of social relations from local contexts of interaction and their reconstructing across indefinite spans of time-space”.

the role of the lecturers. They will be still the key element in the transmission of knowledge, but the students have alternative means to access to the knowledge. In this sense, the teaching tasks must be complemented by the tasks to orientate and assess the students in the knowledge acquirement. This requires an adequate preparation of the lecturers, who must incorporate new methodologies and tools to support the learning processes of the students. For this reason, the lecturers needs support in three aspects:

- Technical and didactical training: It is important to provide training for the lecturers with the objective to avoid a digital divide in the teaching so that the use of the ICT's in the lectures will be widely accepted and seen as positive.
- Motivation and recognition: teaching must be recognised as a value activity and must be evaluated as the investigation activity to promote permanent improvements in the teaching quality.
- Investment: It is necessary to invest in the technical equipment and to update the ICT's used in the universities.

Also in the research area, the ICT's have played an important role promoting the growth of the quantity of the scientific and technical production at the universities, but also its quality. Considering research as a transmission process of specific information within the scientific community, the ICT's have improved the whole process. Through the ICT's, global scientific communities has been constituted, in which the research results are transmitted quasi automatically.

The application of ICT's will allow occupying a relevant position in the knowledge market facilitating the free online access to libraries and archives, but also opens new markets for educational products. In 2004, the market of virtual education products is dominated by the USA (65,2%) followed by Europe (17,1%) and Japan (9,6%). These changes are accompanied by the appearance of new competitors in the area of the Higher Education. The figure of the spin-off is coming into the scene. They are still important in the USA, but also in the EU the spin-off are gaining relevance. As any other organisation, also the universities must adapt their internal procedures to the environment of the information society, designing their procedures based on the use of ICT's. This will allow mayor flexibility in the administration of the universities, a decentralisation and a cost reduction. The benefits are not only for the university as an organisation improving (e.g. the financial management, the human resource management, the academic management and in general the decision making process), but also for the students (e.g. through the inscription by internet, as well as the access to their evaluations and the access to relevant information online).

The CRUE report underlined that the universities have made considerable efforts to introduce and to use the ICT's. These strategies can be classified as

more reactive than proactive, more improvised than planned. However a good practice framed the introduction of ICT's in a general strategic plan of the universities taking into account the specific condition of the university (e.g. its organisational structures and procedures), but also the specific objectives of each university. The definition of the general strategy gives place to the plan action. The key is the implication of all university units, to achieve a general agreement, that the ICT's are positive, and to transmit, what is expected. This includes strategies to motivate the personal, specially the lectures to use the ICT's, including training programmes, evaluation programmes, etc. ...

The CRUE report recommend to develop programmes that focus on the training of lecturers to the general use of the technological media in their lectures and the tutorization of the students, but also initiatives to support the students to purchase laptops and access to Internet giving wireless connections all over the campus. These two areas of action are important to achieve the objective to the general implementation of the ICT's in the day-to-day work of the universities. The universities have made investment to digitalize the universities (e.g. online-access to the library search system, online access to university administration procedures, technological innovation of the classrooms etc), but the report from 2004 argued for a strategy change working together with the public administration improving the general access of the students to the facilities avoiding a digital divide between the students. This was the objective of the action plan „*educacion.es*” within the general action plan „*Espana.es*”. C. Sigalés (2004) pointed out that the politics of the information society were well-received in the Spanish Universities. From the nineties on, a growing use of the technologies of information and communication can be observed at the universities and the universities have promoted many projects to use the ICT's. But Sigalés also pointed out that many of the projects were not successful. In his opinion, the success of this projects depends on their integration in the existing structure and processes of the universities and must take into account the specific characteristics of the user. When a project defines objectives and is designed, the specific characteristics of the students and the pedagogical project must be considered. Sigalés mentioned different factors to consider at the beginning of ICT-projects:

- The higher accessibility facilitated by this technologies.
- The pedagogical potential.
- The competences of the lectures and students to use this technologies.
- The growing social pressure to use these technologies.
- The potential to overcome temporal and spatial barriers in teaching, but also in researching; and
- The potential to contribute to the creation of a global University space.

The first criteria for the decision to use ICT's must be the improvement of the quality of the lectures. The ICT's can improve the presentation of contents, the connection to reality, the simulation of problem solving and the comprehension of complex concepts.

Nevertheless, the use of the ICT's by itself would not improve the lectures, it must be integrated, as mentioned before, in the didactical programme and must take into account the social characteristics of the students (and the lecturers). For instance, young students have other characteristics and needs than students in lifelong learning programmes (the first ones have a higher disposition to assist to classes than the second ones, and therefore the lifelong learning programmes require more virtual learning environments).

The lifelong learning programmes based on virtual learning spaces must take into account social factors like the characteristics of the students as:

- The level of previous knowledge of the contents that is going to be transmitted in the course or programme.
- The competence level to use ICT's and the technological tools which are available (including the infrastructure).
- The motivation to participate in the course or programme and student's capacity to organize their learning activities within their professional and social activities.
- The constrictions to participate in activities, which requires the corporal presence.

But the growing virtuality of the learning spaces at the universities requires mayor changes in the organization of the learning and teaching activities. The lost of the face-to-face relation between lecturers and students, but also the lost of direct contacts between the students caused new needs in the didactical organisation (Sigales 2001). This implies also a change of the role of the lecturer. Virtual learning portals permit the students to access to the contents from the beginning of the lectures. This changes the relevance of the classes, where the lecturers transmit the contents to passive student. The tasks of the lecture will change from the transmission of knowledge to support the students in the construction of their own learning processes. E. Terren (2005) summarizes these changes in the role of the teachers and lecturers in Figure 2⁵.

⁵ Terren is talking about the role of the teachers in the primary and secondary education, but these statements can be translated also to the Higher education (2005).

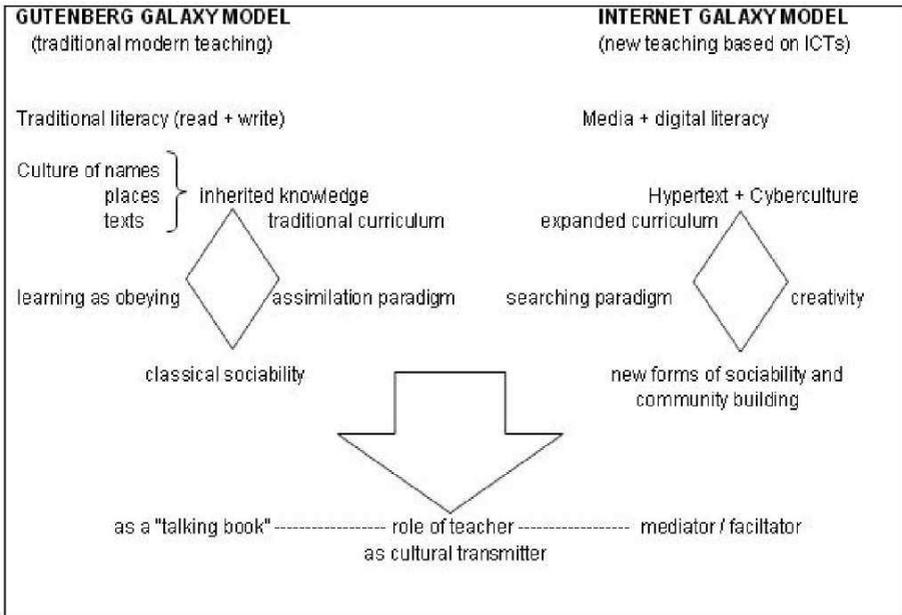


Figure 2: Change of role in the teaching-learning (E. Terren).

5. Employment in the Transition to the KBS: the S&T Worker

5.1. What is a Knowledge Worker or Science&Technology Worker?

The term „knowledge worker” describes those workers who are participating most effectively in the knowledge-society and the knowledge economy. The OECD proposed the following definition: „Knowledge workers” are conceived as these employees who are working in knowledge sectors or workers with specific skills and competencies. At the core of the concept lies the idea that knowledge workers are involved in the creation and utilisation of knowledge. Generally they are defined as high-skilled worker, who are working in the services sectors or services tasks. There are different definitions proposed as for example:

– **Symbolic analyst:** this term was proposed by Reich (1991) distinguishing the „symbolic analytic services” from direct personal services and routine production services. Workers in the first of these categories are professionals, upper-middle managers and above, and others who create, modify, and synthesise knowledge.

– **Science and technology (ST) personnel as high-skilled workers:** The *Canberra Manual on the Measurement of Human Resources Devoted to Science and Technology* (OECD 995) includes different ways to classify science and technology workers. The Manual defined this category as follows: The persons „who fulfil one or other of the following conditions: a) successfully completed education at the third level in an S&T field of study; b) not formally qualified as above, but employed in a S&T occupation where the above qualifications are normally required⁶”. (OECD (1995) *The Measurement of Scientific and Technological Activities Manual on the Measurement of Human Resources devoted to Science&Technology*. „Canberra Manual” Paris. P: 16) Combining qualification and occupation, the OECD identifies both education and skills needed for different types of jobs as the basis for the S&T workers (Cervantes 1999).

– **Knowledge worker according to new occupational groupings:** Lavoie and Roy (1998) proposed a concept of knowledge workers, which goes beyond the concept of S&T workers. From their point of view, the knowledge economy has an increasing need of high skilled workers whose skills are not exclusively related to science and technology. Their concept of knowledge workers includes also the tasks of the control, management and co-ordination of activities. For this reason, they redefine occupational categories based on the use and production of knowledge by workers and reclassify economic activities according to tasks performed by workers. They classify the occupational categories in five domains: knowledge, management, data, services and goods.

The concept of knowledge workers seems quiet unclear in its definition. It has a proximity to the category of Science and technology workers as the OECD Canberra Manual proposed, but it goes beyond this category including also managing functions in the concept of „knowledge worker”. As such, it includes the groups 1–3 of the Standard Occupational Classification. In this sense, the concept of „knowledge worker” is the aggregation of the categories of high skilled worker in one category. For the objective of this studies, which is oriented to the University systems it seems more appropriate to use instead of the broad category the nearer category of Science and technology workers proposed by the OECD.

⁶ The OECD conceived science in the broad sense of the term as all kind of science and not only natural science. It starts form a definition of technology as ‘the application of knowledge’, and more narrowly dealing with tools and techniques for carrying out the plans to achieve the desired objectives. (OECD 1995: 16).

5.2. S&T Worker

2007 is in Spain, officially „The year of science”. Due to this, and to the results of several studies about the R&D, that diagnose the situation of the science in Spain, the Government has designed the „Plan Nacional de i+D+I 2008–2011”, to improve the R&D activity. The evaluations of these studies show different aspects of the scientists working in Spain. In the field of human resources, the number of research workers per 1000 inhabitant its with 5,2/1000 very far from the average of the OECD with 8/1000 in 2003.

Spain has made an effort in the field of training, increasing the proportion of university graduates faster that the rest of the OECD countries. In the population between 25 and 34 years old, a 60% has complete the secondary studies, whereas in the OECD is the 75%.

The PhD studies also have to improve, because they are basic to generate a competitive knowledge system. The main challenge is to increase the success rate and the internationality. Most research is done in the framework of the universities and public research centres (mainly integrated in the CSIC).

The study programmes in the universities, are more facing to academic than to business world. Therefore the mobility of researchers between the public field and the companies is not discouraged. For this reason, one of the main challenges of the Spanish University system is to update their study programmes and structures.

To achieve this, the Spanish university system requires, incentives that strengthen the excellence of teachers. The system of selection of university personnel has serious faults (high endogamy), aggravated by bureaucratic restrictions that complicate the teaching and researching compatibility.

Another key element for the developing of the R&D is the improvement of the labour market, characterized by a persistent divide between the precarious situation of the temporary contracts and the long duration fellowships, opposite to the permanent position of investigation, that are very restricted. So it's necessary to improve this situation at all levels, no only in the economic field (e.g. labour stability), but also in the social recognition, and improving the work conditions of the researchers.

In Spain, the research world it's very linked to the University. More than an 80% of the companies never have had contact with the research project of the universities. This shows a lack of links and collaborations between the research projects and enterprises. The Technological Centres have an important role for the dynamization of the private expense en R+D, important also for the training

of technicians and a high capacity of transference of the knowledge to enterprises by shared projects and technological services.

The cost destined to the R+D in 2005 was 1,13% of the GDP, which is only half of the average of the OECD. This number doesn't favour the attainment of the objective of the strategy of Lisbon to arrive in 2010 at 2.6% of the GDP in investigation. The investing in R+D comes mainly from the public sector, with a small participation of the business sector, which entails that the process of incorporation the innovations as a basic element in the private sector is very slow. In Spain, in 2003 only 30% of the researchers worked in companies, when the average of the OECD is 65%. According to the INE, in 2005, the percentage of researchers of the enterprise sector had increased to 31,9%. The results or products of the R+D activity in Spain, both scientific publications and patents, have not reached the European levels. Although the percentage of published papers has increased from a 1,3% in 1988 to a 2,9% in 2005, it is far from the OECD levels.

To reach a public co-funding of the R+D of 1/3 is one of the main challenges, as the remaining 2/3 should come from the private investment. On the other hand, the capital risk (on its start-up) were a 0,013% of the GDP in Spain in the 2005⁷, when the average of UE 15 is of 0,022%.

5.2.1. Offer of S&T Workers

Based on the definition of knowledge workers made by the Canberra Manual, we can consider that the main offer of knowledge workers is coming from the Higher Education. That means, the leavers of Higher Education are the potential work force in the knowledge sectors. In the 1980's and 1990's, the students in higher education, who finalized their studies in the year 1999/2000, increased of up to more then 117 000 persons (see Table 5). Nevertheless in the last years the number of students, who finalized their studies, has decreased from a maximum of 120 157 to 103 241 persons⁸. In parallel, the number of PhD students also reached the maximum in the academic course 1999/2000. At present, the number of PhD-students, who finish their degree, is around 7000 persons. In the last decade (from 1995/06 to 2005/06) more then 70 000 persons have achieved their PhD.

⁷ Eurostat.

⁸ One of the main reasons of this decline is the demographic effect: in 2005, the group of persons between 16 and 25 years is considerably lower then in 2000.

Table 5

Evolution of the graduate students and PhD awards (1995/96 to 2005/06)

	Studies of the 1st&2nd cycle	PhD awards
1995/1996	100 241	5 880
1996/1997	108 665	6 140
1997/1998	118 982	5 931
1998/1999	120 157	5 984
1999/2000	117 731	6 408
2000/2001	117 367	6 380
2001/2002	119 351	6 936
2002/2003	115 136	7 467
2003/2004	111 730	8 176
2004/2005	107 154	6 902
2005/2006	103 241	7 159

Source: INE 2007.

On the other side, the number of new students has been relatively stable in the last 5 years (see Table 6). But the distribution between the different areas has varied considerably. The experimental sciences and the technical science have lost their classical attractiveness, while the health sciences and social and law sciences, gained importance.

5.2.2. Demand of S&T Workers

The offer of the Knowledge worker must be compared to the demand of the Labour market with the objective to evaluate its capacity of absorption (Cruz Castro&L. Sanz Menendez 2004: 2) stated that the „main problem of the Spanish S&T system was the low level of R&D investment” in comparison to other EU-member states. This situation has its reflection in the „insufficient human resources in R&D (in 2001 Spain had 80% of the average EU ratio of researchers per working population), especially in forms ... in a context of growth in the number of PhD recipients, an emerging mismatch was perceived between the supply of PhD’s and the demand of them, especially in some disciplines and S&T specialisations.” It is clear that most segments of the labour market for knowledge workers have an insufficient capacity of absorption.

Table 6

New students by science areas (N° of students)

	Total	Experi- mental sciences	Health sciences	Social and Law sciences	Human sciences	Technical sciences
2000–2001	291 849	21 325	26 104	142 308	26 757	75 355
2005–2006	292 841	17 593	27 751	151 888	29 448	66 161
Difference in N° of students	992	-3732	1647	9580	2691	-9194
Difference (%)	100,3	82,5	106,3	106,7	110,0	87,8

Source: Instituto Nacional de Estadística.

The data from Eurostat related with the R+D investment shows that Spain increased their performance from 1995 (0,79%) to 2004 (1,07%) (see Table 7). Nevertheless, Spain is still above the EU25 average.

Table 7

R+D investment by country in % of the GDP (1995–2004)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EU (25)	1,81	1,79	1,79	1,8	1,86	1,86	1,89	1,90	1,90	1,86
EU (15)	1,85	1,83	1,83	1,84	1,90	1,91	1,94	1,95	1,95	1,92
Germany	2,19	2,19	2,24	2,27	2,4	2,45	2,46	2,49	2,52	2,49
Spain	0,79	0,81	0,80	0,87	0,86	0,91	0,92	0,99	1,05	1,07
Italy	0,97	0,99	1,03	1,05	1,02	1,05	1,09	1,13	1,11	
Hungary	0,73	0,65	0,72	0,68	0,69	0,79	0,94	1,01	0,94	0,89
Netherlands	1,99	2,01	2,04	1,94	2,02	1,90	1,80	1,72	1,76	1,78
Austria	1,54	1,59	1,69	1,77	1,88	1,91	2,04	2,12	2,19	2,26
Poland	0,63	0,65	0,65	0,67	0,69	0,64	0,62	0,56	0,54	0,56

Source: INE and Eurostat.

Table 8 indicates that the private R+D investment has increased in relation to the whole R+D investment, and that Spain has shortened the gap to the EU25. However, the percentage of private R+D investment is still far away from the EU-average.

Table 8

Percentage of private R+D investment over the whole R+D investment (in %)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
EU (25)	62,4	63,1	63,7	63,3	64,5	65,1	65,1	64,2	64,2	64,5
EU (15)	62,7	63,4	63,9	64,1	64,7	65,4	65,5	65,1	64,6	64,6
Germany	66,2	66,2	67,4	67,8	69,6	70,6	69,9	69,1	69,8	70,3
Spain	48,1	48,1	48,8	52,9	52,3	53,8	52,2	54,5	54,3	54,2
Italy	53,6	53,5	49,5	48,6	49,0	49,5	48,6	47,8	46,8	
Hungary	43,8	43,1	41,7	38,2	40,6	44,3	40,4	35,6	37,2	41,6
Netherlands	52,3	52,7	54,4	54,1	56,4	58,4	58,3	57,0	57,4	57,9
Austria				63,3				67,0		
Poland	39,7	41,5	40,0	41,8	40,6	35,9	35,5	19,6	27,8	28,6

Source: INE and Eurostat.

In spite of that the situation on the knowledge worker labour market has improved in the last years, decreasing of the number of university drop-outs and increasing the number of work places for knowledge workers, there is still a insufficient demand for knowledge worker in comparison to the number of people with a university degree (bachelor, master or PhD). Figure 3 indicates that the R+D-personnel has increased from 47 342 work places equivalent to a full journey to more than 100 000. However, this increment seems insufficient to absorb the number of university leavers.

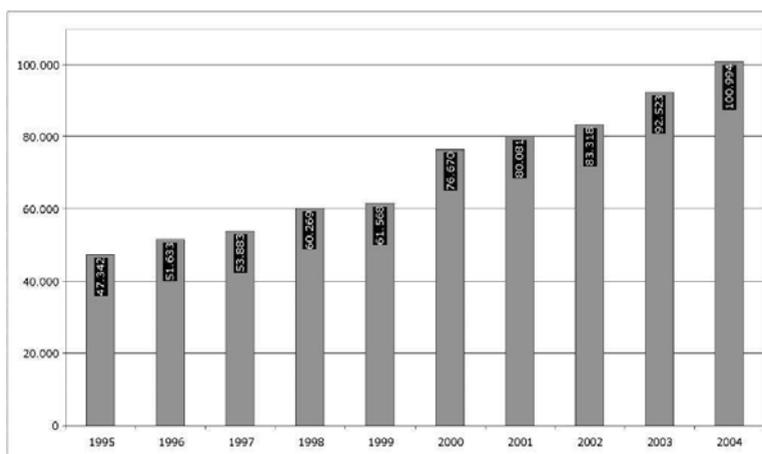


Figure 3: Evolution of the R+D full-journey personnel in Spain (1995–2004).

Source: INE.

The increase of the S&T workers in absolute numbers has its reflection, in its share in the total labour forces, as shown in Figure 4 (from 32,9% to 39,8%).

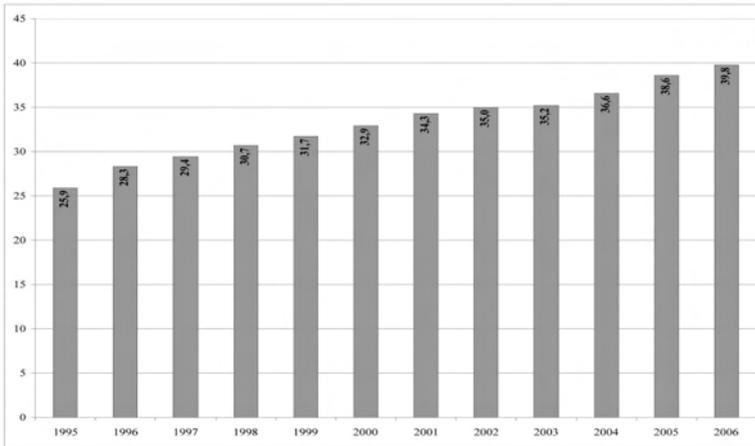


Figure 4: Human resources in science and technology as a share of labour force in Spain (Total %).

Source: Eurostat.

The Spanish Knowledge system has achieved the average level of the EU25 (Table 9).

Table 9

Human resources in science and technology as a share of labour force (total %)

	2000	2001	2002	2003	2004	2005	2006
EU 27	34,0	34,5	35,0	35,8	36,9	37,6	38,3
EU 25	34,8	35,3	35,7	36,5	37,7	38,4	39,1
Germany	41,5	41,6	41,5	42,2	42,7	42,9	43,2
Spain	32,9	34,3	35,0	35,2	36,6	38,6	39,8
Italy	28,8	29,8	30,3	30,7	32,5	32,6	34,6
Hungary	29,6	28,8	29,0	30,2	31,8	31,4	31,9
Netherlands	45,4	45,4	45,8	48,2	49,4	49,6	48,1
Austria	31,4	32,2	33,4	32,8	40,7	38,8	38,3
Poland	25,1	25,3	25,6	27,4	28,3	29,3	31,4

Source: Eurostat.

The statistical data allows also to identify the sectors that are employing more S&T workers. The sectors „education”, „health and social services”, „financial intermediation”, „real state activities”, „public administration, defence and compulsory social security”, „energy” and community and social services” are the sectors, which employ high skilled workers above the average. It is important to highlight that all sectors, except the „extraterritorial organisations and bodies” and „education”, have increased the knowledge workers (Figure 5).

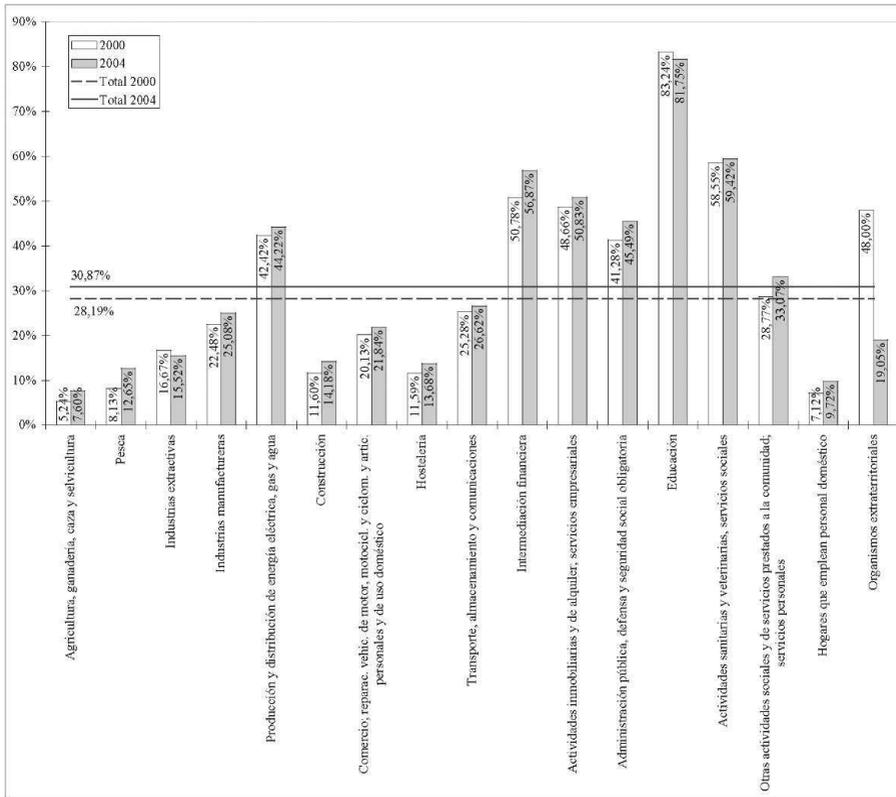


Figure 5: Rate of High Qualified Worker in the Occupational Structure by sectors (2000 and 2004).

Source: INE.

The data from Eurydice indicates, that the persons with higher education have more possibilities to find an occupation. In Spain the occupation rate of the persons with higher education is (with 81,9%) considerably higher than the of the other labour force categories (Table 10). However the insertion of the high-educated persons is not easy. For example, within the EU, the unemployment

rate of graduates between 25 and 34 years doubles the one for workers between 35 and 44 years (Fundación Conocimiento y Desarrollo 2007: 125). And the unemployment rate of the higher educated persons is with (7,3%) especially high in Spain in comparison to other OECD countries. Only Turkey has a similar rate. This indicates the problems of absorption of the Spanish S&T Labour market.

Table 10

Employment rate, occupation rate and unemployment rate by countries and level of qualifications (2004)

	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
	Activity rate			Occupation rate			Unemployment rate		
Austria	56,6	76,7	85,0	52,2	73,9	82,5	7,8	3,8	2,9
Germany	61,1	78,2	87,5	48,6	69,5	82,7	20,5	11,2	5,5
Hungary	41,4	74,6	84,5	36,9	70,9	82,7	10,8	5,0	1,9
Italy	56,0	77,7	86,5	51,6	73,5	82,3	7,8	5,3	4,8
Netherlands	62,6	80,8	88,1	59,0	77,7	85,6	5,7	3,9	2,8
Poland	51,9	74,3	87,8	37,5	61,3	82,3	27,8	17,4	6,2
Spain	64,6	80,7	88,3	57,5	73,0	81,9	11,0	9,5	7,3
EU-15	63,1	79,8	88,1	57,5	74,9	84,4	9,0	6,2	4,3
OCDE	62,5	79,0	87,2	56,6	74,2	83,9	10,3	6,2	3,9

Source: OCDE – Employment Outlook, 2006 cited in Fundación CyD (2007).

5.3. Work Conditions of KW

We start analyzing the total number of hours worked per year in Spain, compared with countries of the OECD. The average time dedicated to work per year in Spain is the second highest of Europe (each employee does 160 hours more per year). If we analyse this deeply, we can see that in Spain a 20,4% of the population is self-employed, opposite to 14,7% in the UE. The self-employees typically work more hours than the wage-earned and this could explain the excess of working hours in Spain. The wage-earned workers, work slightly more than the European standards, but without an excessive differential.

If we measure the total number of hours worked divided by the number of people in working ages, Spain occupies the last position in the UE, with an

average of 18 hours for person in front of the 24 of the average in Europe. This differential it's explained for the high unemployment levels and, above all, for the low activity tax, fundamentally feminine.

Respect to the type of working day, the 82% of the male labourers work more than 40 hours a week, an average very far away from the EU standards. But, according to surveys, this is not their interest: only 49% that work 40 (or more) hours prefer this type of dedication. This is more convincing if we consider the 33% of the employees that dedicate 45 (or more) hours: only 6% really wants this high dedication to work.

For women, the distribution of the work time is very different. Spain is the second country of the EU where a higher percentage of women work 40 hours or more (just after Portugal). An explanation of the low incidence of the partial-time work in the feminine population could be the lack of this modality of work in Spain. The conclusion apparently is that if this works would exist, women will take this modality. But the reality it's not so evident. We can observe that only one third of the women would get a part-time job (less than 35 hours), opposite of the European average of 55%, and extreme answers as the 76% of Dutchwoman. About half of the Spanish women want a contract with a dedication of more than 40 hours. In this situation, it seems that part-time job is not understood as the more effective way to incorporate women to the labour market.

One of the characteristics of the work in the KBS is the flexibility of the working time. There is a specific modality with a fix number of hours of work (daily, weekly or monthly), but with the freedom of choice the distribution. In Spain less than the 10% of workers use this modality. Another unconventional type of work is the irregular work. A person with an irregular horary it's the one that works at least 2 Saturdays or Sundays per month or when at least the half of his/her working period finishes at night. According to this definition 24% of the employees of the EU work at irregular hours. In all the countries of the EU, the percentage of men with irregular horary is higher than 50%, except in Portugal. In Spain the irregularity exceeds the regular horary, but with very close numbers, whereas there are countries with a higher irregularity, as Finland (74%), Sweden (67%) or the United Kingdom (64%). Again, Spain is at the back of the new type of jobs.

At the beginning of the century, a certain trend to precarious work conditions in the Science Labour Market was perceived. The increasing number of researchers shown in the official statistics was based on the growth of temporary works with low salary.

„Fellowship had become the regular labour relationship even for experienced PhD's.” (Cruz Castro&Sanz Menendez 2004: 3).

The Spanish science labour market is even more characterized by the precarious work conditions (e.g. temporary contracts), but also grants without formal labour relations (e.g. they finish when the research project finishes). Another characteristic of the Spanish Science labour market is the fact „that the average expenditure per researcher, in purchasing power parity (PPP) in the public research sector (governmental laboratories and universities) is significantly lower in Spain than in other EU countries.” Taking as reference the average incomes of the cohort with secondary education, as e.g. the OECD report „Education at glance 2005”, we observe that only in Denmark and Norway the income difference is lower (Table 12).

Table 12

Average annual income by educational level (secondary level = 100) person between 25–65

	Primary	Secondary	Tertiary	University ed.
Australia (2001)	77	100	132	142
Belgium (2003)	89	100	130	148
Canada (2002)	79	100	136	161
Denmark (2002)	88	100	124	126
Finland (2002)	95	100	150	180
France(2002)	84	100	150	167
Germany (2003)	87	100	153	163
Hungary (2003)	80	100	235	235
Ireland (2000)	87	100	149	163
Italy (2002)	78	100	153	153
South Korea (2003)	67	100	141	156
Luxembourg (2002)	79	100	146	166
Netherlands (2002)	84	100	148	Nd
N. Zealand (2003)	77	100	128	150
Norway (2002)	85	100	137	135
Spain(2001)	78	100	129	141
Sweden (2003)	92	100	135	146
Switzerland (2003)	76	100	158	168
United Kingdom(2003)	69	100	162	178
USA (2003)	70	100	183	191

Source: OECD Education at glance 2005, cited by the Fundación Conocimiento y Desarrollo (2007: 127).

Table 13

Gross annual salary by occupation groups (2004)

	Total	Total = 100	P = 100
TOTAL	18 182,44	100,0	91,3
A Legislators, senior officials and managers of enterprises with more than 10 employees	49 292,46	271,1	247,5
D Professionals associated to the 2 nd and 3 rd university cycles and associated professions	28 436,78	156,4	142,8
E Professionals associated to the 1st university cycles and associated professions	23 867,16	131,3	119,8
F Technicians and associated professions	25 285,09	139,1	126,9
G Clerks	16 298,63	89,6	81,8
H Workers in the personal care, hotel and restaurant sector	11 842,71	65,1	59,5
J Workers in the protective and security sector	16 906,20	93,0	84,9
K Sales workers	12 380,64	68,1	62,2
L Qualified workers in the agricultural and fishery sector	13 920,91	76,6	69,9
M Qualified workers in the Construction, except machine operators	17 412,98	95,8	87,4
N Qualified workers in the mining, metal and machine building industry and associated professions	19 917,97	109,5	100,0
P Qualified workers in the printing, textile and ready made clothes, food and carpentry industry, handicrafts and associated professions	13 769,54	75,7	69,1
Q Plant and stationary machine operators and assemblers	17 677,73	97,2	88,8
R Drivers and operators of mobile machinery	16 526,01	90,9	83,0
S No qualified service workers, except transport	10 807,22	59,4	54,3
T No qualified workers in agriculture, fishery, construction, manufacturing and transport	13 474,59	74,1	67,7

Source: INEM. Note: Own translation.

The analysis of the annual salary by professional category (Table 13) confirms the above mentioned trend. The category (D), which includes all the professions associated to titles of the 2nd and 3rd higher education cycle, gains 56,4% more than the average salary of the total labour force. The category (E) referring to all the professions associated to titles of the 1st higher education

cycle gains only 31,1% more. Taking as a reference the professional category (P) (qualified workers of the mining industry, metal manufacturing, machine construction and similar) the difference is 42,8% and 19,8% even lower, respectively.

Table 14

Relative unbalance between demand and supply for work by occupational groups
(period May 2005 – April 2006)

Occupational Group	Indicator
Management of enterprises and of public administration	112,0
Scientific and intellectual technicians and professionals	106,3
Technicians and professions of support	98,5
Workers in administrative tasks	104,9
Workers in hotel and restaurant sector, care services, security and trade sector	104,4
Qualified workers in the agriculture and fishery sector	88,0
Handicraft and qualified workers in manufacturing, construction and mining, except integrants in the following groups	92,3
Plant and Machine Operatives and assemblers	100,8
No qualified workers	100,9
Military personal	100,7
High qualification	102,8
Low qualification	99,5
TOTAL	100,0

Source: INEM cited by Fundación Conocimiento y Desarrollo. Note: Own Translation.

These are, together with the data of the unemployment rate of the cohort with higher education globally and the data of the cohort with higher education between 24 and 35 years old, indicators that prove that young graduates are often forced to accept, at the beginning of their careers jobs which are not corresponding to their qualification level.

The alternative is to select a jobs with precarious conditions (low salary and temporary work)⁹.

This unbalance in the S&T Labour market is confirmed by the official data from the Spanish Labour Market (Table 14). The *Fundación Conocimiento*

⁹ See Fundación Conocimiento y Desarrollo (2006: Informe CyD 2006. Barcelona 2007. Page: 125.

y *Desarrollo* has made an analysis of demand-offer balance in the different labour market segments based on data facilitated by the Spanish National Employment Service. The results indicate a unbalance in the occupational groups: „directors of enterprises or public administration” and „scientific and intellectual technicians&professionals”.

Within the high-qualified occupations, the group, which shows the mayor unbalance, is „managers and directors”. However, this group has only a low relevance in the labour market. Also the groups of „Scientific and intellectual technicians and professionals” for all scientific domain exhibits a value clearly below the average. On the other side, the group of „Technicians and professionals of support” has with 98,5% a unbalance, which is under the total average (Table 15).

Table 15

Relative unbalance between demand and supply for work by occupational groups of high qualified persons (period May 2005–April 2006)

Occupational group	Indicator
1 Management of enterprises and of public administration	112,0
<i>A Management of public administration and of enterprises with morethen 10 employees.</i>	<i>111,9</i>
10 Legislators and senior officials of public administration. Senior official of special-interest organisations.	Nd
11 Managers of enterprises with more than 10 employees	111,9
<i>B Directors of enterprises with less than 10 employees</i>	<i>112,7</i>
12 Directors of enterprise with less than 10 employees in the trade sector	116,1
13 Directors of enterprise with less than 10 employees of the hotel and restaurant sector	113,6
14 Directors of other enterprises with less than 10 employees	110,4
<i>C Directors of enterprises without employees</i>	<i>111,7</i>
15 Directors of enterprise without employees in the trade sector	Nd
16 Directors of enterprise without employees of the hotel and restaurant sector	Nd
17 Directors of other enterprises without employees	111,7
2 Scientific and intellectual technicians and professionals	106,3
<i>D Professions associated with titles of the 2nd and 3rd university cycles and similar</i>	<i>106,8</i>
20 Professions associated with physics, chemistry, mathematics and engineering	108,3
21 Professions associated with natural and health science	102,3

22 Professions associated with education	103,0
23 Professions associated with law	110,9
24 Professions of organisation, social and humanistic sciences	108,0
25 Writers, artists and other associated professions	110,8
<i>E Professions associated with titles of the 1st university cycle and similar</i>	<i>105,5</i>
26 Professions associated with physics, chemistry, mathematics and engineering	94,8
27 Professions associated with natural and health science, except optics, physiotherapeutic and assimilated	102,5
28 Professions associated with education	111,9
29 Other professions associated to a title of the 1 st cycle	105,5
3 Technicians and professions of support	98,5
<i>F Technicians and professions of support</i>	<i>98,5</i>
30 Technicians of physics, chemistry and engineering	105,2
31 Technicians of natural and health science	110,6
32 Technicians of child education, aircraft instructions, navigation and driving of vehicles	105,3
33 Professions of support in financial and commercial operations	73,2
34 Professions of support of administrative management	107,2
35 Other Professions of support	98,1
Total occupations of high qualified workers	102,8
Total	100,0

Source: INEM cited by Fundación Conomiento y Desarrollo Own Translation.

The „Agencia per a la Qualitat del Sistems Universitari de Catalunya” (AQU – Agency for the Quality of the University System of Catalonia) has presented a 2nd study about the insertion of the Catalan graduates in the labour market (Table 16). The study was limited to the cohort who finishes their studies with the graduate in the year 2001 in a public university. Although this study is not representative for Spain, it provides some evidences about the process of the insertion in the labour market of young S&T workers¹⁰.

The results of this study confirm the previous results: 90,2% of the 2001 graduates were employed 4 years later. Only 4,8% were unemployed and 5% weren't active in the labour market. The main part of the inactive graduates are developing their PhD. The insertion in the labour market begins normally

¹⁰ Nevertheless, this analysis is relevant for our project due to the fact that our focus region is Catalonia. The analysis of 2005 was oriented to 11.456 graduates. 52,6% of the graduates answered the survey.

before the graduates had finish their studies. 60% of them said that they had worked in the last two years of their studies, thus combining work and studies.

Table 16

Indicators of the Labour Insertion of Graduate

		Huma- nities	Social	Experi- mental	Health	Techni- cal	Total
Type of contract	Permanent	40,0	54,1	47,6	47,7	62,0	53,1
	Self-employee	8,5	6,7	4,0	12,8	12,4	8,8
	Temporary	46,0	36,3	35,0	37,1	23,4	34,3
	Scholarship	3,4	1,7	11,9	1,4	1,9	2,7
	Without contract	2,2	1,2	1,5	1,1	0,3	1,1
Salary	Less then 9000 €	19,2	10,5	10,7	7,3	3,2	9,6
	9000–12000 €	28,7	17,9	18,5	16,6	5,6	16,2
	12000–18000 €	32,9	36,6	35,1	32,2	20,2	31,3
	18000–30000 €	17,0	29,9	30,8	32,9	48,2	33,1
	30000–40000 €	2,0	3,7	4,2	8,4	17,1	7,4
	More than 40000 €	0,3	1,5	0,8	2,7	5,7	2,5
Area	Public	36,2	32,8	30,7	38,5	15,9	29,4
	Private	63,0	67,2	69,3	61,5	84,1	70,6

Source: Antoni Serra Ramoneda (ed) (2007) *Educació superior i treball a Catalunya: Anàlisi dels factors d'inserció laboral*. Barcelona. www.aqucatalunya.cat.

The data of the AQU-survey 2005 shows that only 53,14% of the graduates have fixed contracts. In other words around 40% of the graduates are working in unstable working conditions: 34,3% of the graduates had a temporary contract, 1,13% do not have any contract and 2,66% have a scholarship¹¹. Compared to a study done in the year 2003 (graduates of 1998), the percentage of temporary contracts has increased by 3%.

¹¹ We do not include here the category of selfemployees workers. This category includes very heterogeneous working and life conditions.

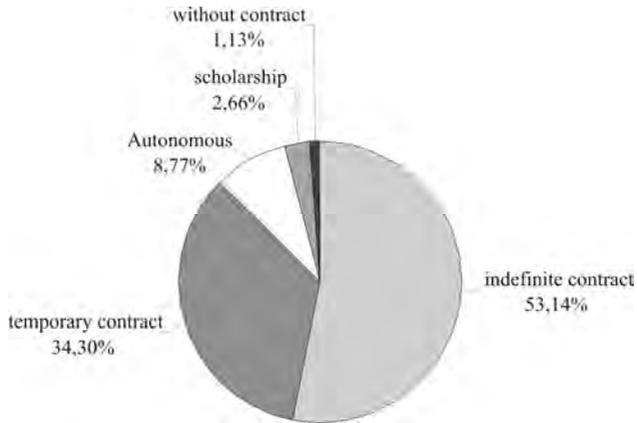


Figure 6: Type of contract of the graduates.

Source: Antoni Serra Ramoneda (ed) (2007) Educació superior i treball a Catalunya: Anàlisi dels factors d'inserció laboral. Barcelona. www.aqucatalunya.cat.

The analysis of the incomes structure shows that more than 25% of the graduates which answered to the survey, have a salary lower than 15000 € and around 57% have an income lower than 18 000 € per year (Figures 6 and 7).

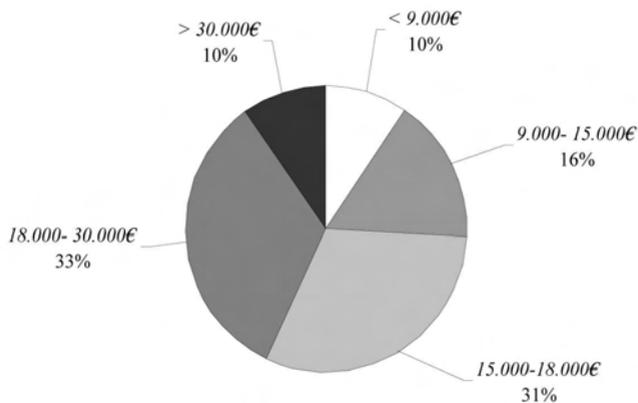


Figure 7: Income of the graduates by income categories (in €).

Source: Serra Ramoneda (ed) (2007) Educació superior i treball a Catalunya: Anàlisi dels factors d'inserció laboral. Barcelona. www.aqucatalunya.cat.

5.4. Relation HE – Enterprises

One of the aspects that create a higher controversy in the Spanish Science and Technology during the last twenty years has been the low integration of the private companies in the system. As the S+T indicators show, the participation of the private sector in the Spanish system is very low, compared with the EU average. However, an improvement of the indicator can be observed in the last years¹².

All the National Plans of R+D use part of the budget to the implication of the private sector. There are diverse strategies to improve the link university – enterprise as cooperation agreements to perform specific research tasks, the creation of technological parks, the joint institutes of research (or training), and the promotion of spin-off companies. The improvement of this link includes also the orientation of the academic qualifications to the labour market and the integration of practical parts in the higher education cycles.

The CRUE created in 1997 the „Red de Oficinas de Transferencias de Resultados de Investigación de las Universidades Españolas (The Network of Offices to Transfer the Research Results of the Spanish Universities – RedOTRI)” as a working group within the their structure.

The „Oficinas de Transferencia de Resultados de Investigación” (Offices to Transfer of Research Results – OTRI) are departments of the universities, whose task is to increase the relation between universities and the private sector, so that the research capacity of the university and the research results are useful for the economic and social development. The creation of these offices in the universities started in 1988.

In spite of that, all experts agree about the weakness of this relation, in both, training and research. Most experts (e.g. the Deputy Director of the OTRI of the Polytechnic University of Catalonia) qualified the relation university – enterprise as demand pulled. The Spanish university is responding well on the concrete research demands of the enterprises. But they are not well positioned in the technology push research. In other words, the university have limitation to promote their innovations to the society and the Spanish companies show a limited capacity to absorb the knowledge and innovation generated in the universities.

¹² Las relaciones universidad-empresa no son precisamente de carácter modélico, ni en el plano cuantitativo -por su abundancia y extensión- ni en el cualitativo -por los beneficios que reportan.” Javier Gómez-Navarro (Presidente del Consejo Superior de Cámaras de Comercio, Industria y Navegación de España) (2007) Algunas propuestas de mejora en la colaboración universidad-empresa. In Fundación Conocimiento y desarrollo. Informe 2006. Page. 90.

6. The Challenges of the University

The Spanish debate about the future of the University has one of its main expressions in the so-called Bricall-Report titled „Universidad 2000”. This report was widely discussed and addressed some of the issues, which were tackled also in the Spanish „Bologna Process” or the Spanish process towards the European Higher Education Area (EHEA).

The Bricall-report stated a deeply transformation of the society to which the Universities must react and modify their behaviour to solve their problems. It takes as a reference point the „White Paper on Education and Training” of the European Commission, where the main points addressed are:

- The emergency of the information society, including the changes in the labour organisation and the production processes.
- The globalisation which has a deep impact on the possibility to generate employment.
- The scientific-technological revolution, which is creating a new culture.

This emerging new situation requires a continuous renovation of the knowledge to favour the scientific and social transformation. In the area of education and training, the report stated not only an increment of the demand for higher education, but also the need to change the quality of the higher education. The higher education must be more oriented to the labour market. This orientation towards professional training together with the trend towards lifelong learning implies new challenges for the higher education. Continuous training and education must be integrated in the educational programme of the universities. For this reason, new and renewed forms of education must be implemented giving an adequate response to the needs of the new type of students, the new forms to organize learning and working, and the new professional opportunities. In other words, the higher education must complement its classical education approach through strategies to support the learning of the students. The report is talking about the binomial „education-learning”, in which education is a tool for learning. These challenges require also a change in the design of the curricula, which must be more flexible, and the introduction of practical parts. The orientation to professional training and to lifelong learning strategies implies also the need to improve the relation university-enterprises.

The second pillar of the universities, the research is relatively new in the Spanish University system. The incorporation of research started at the end of the 1960’s and was promoted by laws in 1983 and 1986. However, the Bricall-report stated that the university research is still at the beginning of 2000

insufficient. It needs more funding, but overall an improvement of the link university-enterprise, a stronger impulse for the basic research and for the policies for technology transfer as well as the training of new researchers.

The socio-economic challenges require also, in the opinion of the authors of the Bricall-Report, a profound change in the organisational structure of the universities. The traditional division of work based on the equivalence of „*academic disciplines = faculties = academic carriers = professional title*” is obsolete. For this reason, the universities must develop new functional organisational models and also new mechanisms of coordination between universities. To perform these challenges, the autonomy of the universities must be strengthened implementing at the same time mechanisms of quality control and accreditation.

In respect to the HH.RR-management, the report argued in favour of a higher diversification of occupational categories and more flexibility. It proposed also the implementation of more objective mechanisms to contract personal, avoiding the endogamy. Besides, the report proposed three basic types of academic personal: the lecturer, the researcher and the lecturer-researcher.

The Bricall-report addressed the several issues, which have dominated the following discussion on the university system: educational innovation, improvement of the research system, relation university-enterprises, quality assurance and governance structure of the universities and the university system. The report avoided a topic we have discussed previously: the precarious work situation of the S&T-workers. However, in the following exposition of the Spanish Bologna process, we see that the educational innovation and the relation university-enterprise are handled under the umbrella of Bologna.

6.1. The Spanish Bologna Process

The Spanish Bologna Process has two main pillars.

- The reorganisation of the academic titles according to the indication of the Bologna declaration.
- The innovation of the teaching process according to the paradigm shift from teaching to learning.

6.1.1. The re-Organisation of the Academic Titles

The first official steps towards the EHEA was made in 2001 by the „Ley Orgánica de Universidades” (LOU – Organic Act of Universities). The LOU

includes some detailed information regarding the European supplement, the structure of the cycles, the European credits and the mobility of the students. Some specific aspects had been regulated in different Real Decrees approved in the following years: Royal Decree to establish the ECTS (2003), the Diploma Supplement (2004) and the three-cycle structure in accordance with the general lines emanating from the European Higher Education Area (January 2005). Recently, the Ministry of Education and Science has proposed to introduce modifications to these decrees and finally Spain opted for the „4+1” (4 years bachelor plus 1 year master), a system that is clearly different for the leading countries at the UE, who opted for „3+2” (3 years bachelor plus 2 year master).

In the LOU, the quality promotion and assurance was established formally as one of the main aims of the University policy. For this reason, the *Agencia Nacional de Evaluación de la Calidad y Acreditación* (ANECA – the National Agency for Quality Assurance and Accreditation) has been created in 2002. In addition, regional quality assurance agencies had been funded in nearly all the 17 Autonomous Communities (e.g. the *Agencia per la Qualitat del Sistema Universitari de Catalunya*; AQU-Quality Assurance Agency in the Catalan University). ANECA, as well as the regional agencies, have leading role to restructure the professional titles and the wider implementation of the Bologna process.

A three-cycle structure (Diplomado/Licenciado) has been used in the Spanish since the University Reform Act (1983). But the new structure (graduate/master/doctor) is quite different. The first cycle will lead to the degree of „graduate” includes basic, general and professional training. It will be offered from 2008/09 on. It is, in principle, strongly labour market oriented.

The graduate degree will allow the access to the Master programme. The implementation of this new programme was introduced in 2006/07 (pilot programs), as well as the new PhD programmes. The Masters programmes are focused on advanced training for research or professional specialisation. Once completed successfully the Master cycle, the student has access to the PhD programme. The doctoral degree confers the possibility to pursue a teaching or research career.

Parallel to the re-organisation of the academic titles, the implementation of the ECTS has been performed. Historically, the Spanish University system used a credit system based on the calculation of the teaching hours (1 credit = 10 face-to-face hours of classes). This system is not compatible with the ECTS, which is based on average workload of the student assigned to the course. The adaptation of the Spanish credit system to this of paradigm change (student centred instead of professor-centred) is considered as the starting point of a profound renovation of the organisation of the universities and of the didactical method.

6.1.2. *The Change of Lecturing*

The integration of the Spanish university system to the EHEA based on the principles of Bologna is considered by the political decision makers as an opportunity to reform the system and adequate it to the requirements of the knowledge society. The knowledge society implies changes in the generation of knowledge and its transmission, which requires also a new concept of the academic training, centred in the learning processes. That implies a revalorisation of the didactical function of the University lecturer and the need to improve the quality and the innovation potential of the higher education (MEC 2003). An indicator for the importance given to the didactical innovation within the Spanish convergence process towards the EHEA is the constitution of the „*Comisión para la renovación de las Metodologías Educativas en la Universidad*” (Commission of the Renovation of the Education Methodologies in the University – own translation) by the Spanish Ministry of Education and Culture in 2005.

This change from the teaching to the learning paradigm (or from the credit system based on teaching hours to the workloads) is perceived as conceptual change in the system of higher education (ANECA (2003). The CRUE, for example, expressed that the introduction of the two cycles presents an excellent opportunity to modernize the higher education, its organisation, its objective, methods, contents and the schemes to evaluate the learning process. The objective is the adaptation of the programs, offered by the universities, to the real needs of the society and the challenges of the immediate and not so immediate future (CRUE 2002b). This change implies the need for new didactical methods (CRUE 2002a), and also in the form how the programmes and plans are going to be designed (Cáceres Salas&González López 2005).

A second argument to renovate the didactical methods and practices in the higher education is the adaptation of the academic curricula to the principles of employability and the lifelong learning, which is promoted by the EU and by the successive Spanish Government as a principle of the professional training and higher education in the framework of the Lisbon strategy. Employability is related to the concept of competence development, which, until now, is not part of the discourse of the Spanish University system (see Suárez Arroyo, B. (?). Mora (2006) stated that the Bologna process proposed a new education model to improve the employability of the students based on the principles of the transmission of scientific knowledge and their practical application¹³. The

¹³ Also Gallego (2005) is arguing that the higher education must be focused first at all on the Labour market.

application of the principles of competence development in the higher education will require a deep change in the university didactics (García Martínez 2004) The changes will not only affect the teaching activities, but also the structure and organisation of the University.

To cover these changes, Yániz (2004) refers about the academic professional profile, which must orient the design of the study programmes. On one hand, she defines a professional profile as the professional identity of the persons, who work, sustained in an academic qualification, in a certain area. The professional profile defines the main functions of the related professions as well as the most frequent tasks included in these functions (Yániz 2004: 5). Using exclusively the concept of professional profiles include the risk to reduce unnecessarily the potential of the higher education due of the fact that in the professional requirements are changing rapidly in the actual society. The inclusion of the generic and specific competences is one step to reduce this risk. However this question needs, in the opinion of Yániz, a serious and in depth consideration. She proposed to use the concept of „educational profile”, which underpins the integration of other requirements, and then the professional ones as for example educational, researching, personal and social requirements (Yániz 2004). Putting together the professional and the educational profiles leads her to the concept of the academic-professional profile.

The modification of the study programmes towards the Bologna criteria requires a complex planning at the level of the universities including the explication of the objectives, the selection of the contents in relation to the objectives, the modulisation of the study programme including multidisciplinary activities like seminars, debates, practices, selection of methodologies, preparation of the evaluation process, etc. This complex task requires the cooperation of all parts involved in the study programmes (Yániz 2004). Overall, the participation of the academic staff of the universities is needed (see Valcárcel Cases 2003).

But there are voices, which criticise the process and not necessarily the objective. For example Pastor (2005: 21) stated that it is a political promoted at European and Spanish level without sufficient analysis of the situation of lecturing in the universities neither and without the active participation of the lecturer or students. This has been recognised at the European level by the Declaration of Graz, which qualified a top-bottom perform process as insufficient to achieve the objective of the Bologna process until 2010.

Still in 2005, Pastor (2005) stated an insufficient debate about the convergence process within the universities and an insufficient degree of participation of one of the mainly affected collective: the lecturers. Neither the

lecturers nor the didactic and pedagogic experts have had the opportunities to analyse the implication for teaching in spite of the previewed consequences.

On the other side, Margalef Garcia (2005) call the attention to the fact that this methodological focus on the learning process is not a new approach in higher education. On the contrary, there are many lectures applying coherent didactical methodologies centred in the learning process of the students. Through the pedagogical and didactical research, it is well known that teaching does not automatically lead to learning and that there is not a linear link between teaching and learning. The students must learn by themselves.

In the analysis of the preparation of the lecturer to the Bologna Process, Valcárcel Cases et al. (2003) stated as strong points that the preparation is considered as a relevant issue in the adaptation process, the interest of the lecturers in the national plans of evaluation, that the Ministry of Education is preparing a Real Decree on the role of the lecturer in the convergence process. As a weak point they mentioned the absence of a systematic strategy to inform, to train and to involve the lecturer.

One of the main challenges of the process is the adaptation of the lecturer profile to the emerging environment. The mentioned report of Valcárcel et al. stated that the new profile is probably very different to the traditional profile of an academic lecturer. First of all, the university lecturers are, until now, specialist in their academic discipline. In the new university environment, they must be know and transmit also general competence (team work, search of information ...) and specific professional competences. And the lecturers must have the adequate competences to accomplish their function in the learning processes, which are in the opinion of Valcárcel et al:

- Knowledge of the learning processes of the students within the natural and academic context.
- Planning of the study programme and the didactical interactions.
- Use of the adequate didactical methods and techniques.
- Management of the didactical interactions and the relations with the students.
- Evaluation, control and regulation of the learning process but also if the own teaching process.
- Knowledge of the legal and institutional norms, which regulate the rights and obligations of the lecturer and the students.
- Management of the own professional development as lecturer.

Another important aspect of methodological change is the organisation of the study programme and the courses. The focus on the learning processes and the competence development requires, in principal, a planning based on team

work between the persons and areas involved in the competence development. Generally the competences to be developed go beyond the borderlines of the established academic fields. For this reason, it seems reasonable that the planning of the learning processes has to be interdisciplinary. That requires the creation of university structures besides the traditional work division through academic fields in faculties and departments.

A recent publication of the Ministry of Education and Culture titled „Propuestas para la renovación de las metodologías educativas en la universidad” (2006) is dedicated exclusively to the methodological innovation on the didactical field. The publication (elaborated by the „*Comisión para la renovación de las Metodologías Educativas en la Universidad*”) stated, based on a survey between 55 responsible of the university policies, that the majority of the universities (36 of 55) have developed strategies oriented to the didactical innovation (MEC 2006: 36). And more than 90% of the respondents consider that the convergence process must be used to promote in depth innovation, special in the didactical field in the universities (MEC 2006: 44). At the end of its diagnosis of the actual situation in Spain, the Commission elaborated the following conclusions (MES 2006: 58).

1) To use the European convergence process in higher education to promote a depth innovation, especially in the field of didactical methodologies. The EHEA is perceived as a great opportunity to generalize experience in the methodological innovation made in many universities;

2) The universities should facilitate and support the in depth change of the study plans and programmes aimed to integrate principles and procedures which are necessary for the methodological innovation;

3) A change in the lecturer attitude to improve the didactical training is considered as necessary. This task must be accompanied by policies to motivate and incentive innovations;

4) Through the technological development, the ICT will be, in short time, substantial part of the educational models and of the processes of teaching and learning;

5) The evaluation system of the professional activities of the academic personal has been successful in respect to the diffusion of research results, but has produced the unforeseen effect to demotivate the academic personal in the area of lecturing. The lecturing activities require more attention, support and recognition to affront the didactical challenges of the EHEA;

6) To support the didactical innovation within the convergence process, they recommend that the universities developed strategic plans to integrate lecturing, which must be constantly updated and consented with the academic personal;

7. Conclusions

To conclude the review of the Spanish debate of the Knowledge society, new social risks and universities, the following points are highlighted:

1) The Spanish debate about the actual social transformation is dominated by the paradigm that it is technology driven. For this reason, the debate is focused on the concept „information society” considering the „knowledge society” as the next step in the socio-technological development. In spite of its focus on the social-cultural processes related to the technological innovations, also the concept of the „network society” starts from the presumption that the social transformation is technological driven. This concept underlines that the technologies do not determine their application, but it sustains the new opportunities of action and liberty, which these technologies are offering;

2) In the last decades, the successive Spanish Governments and the Governments of the Autonomous Regions had put in action several programmes to promote the „information society”. In spite of these efforts, however, the statistical indicators show that the differences to other EU-countries could not be reduced in the last years. That indicates also the risk that a considerable part of the Spanish society will be excluded from the „information society”;

3) In the last decades, the successive Spanish governments had put into action several programs to improve the Science and Technology system. The corresponding indicators show the relative success of these efforts bringing the Spanish system closer to the EU-average. Overall the increase of the S&T workers in the Spanish employment structure must be highlighted. On the other hand, One of the most important weakness of the Spanish S&T system is the insufficient link between public and private sector. In spite of the efforts made in the last years to improve this linkage, there is still a gap in respect to the knowledge transfer from the public sector to the private sector. This makes reference overall to the private use of innovation created in the public sector, but also to the creation of S&T employment;

4) The Spanish Labor market shows an insufficient capacity to absorb the newly trained S&T workers. The Spanish S&T labor market is characterized by the precarious work conditions in terms of stability of the work relations and working hours, but also by the low added value of the occupation associated to higher education in terms of annual income in comparison to other occupational groups;

5) The Spanish Bologna process has two main focuses: the redesign of the academic titles and the innovation of didactical methodologies and practice.

– The redesign of the academic title: the new three cycles design is in its implementation phase. The redesign is seen as an opportunity to restructure also the study programs bringing them nearer to the expectation of the labor market and to introduce a competence approach. At the national, but also at the level of the autonomous regions quality agencies has been created. The main focus of discussion was the adaptation of the traditional credit system calculated based on lecturer hours to the workload principle. This is considered as an opportunity to innovate the didactical methodologies and practices.

– The innovation of didactical methodologies and practice is discussed as necessary in the course of the convergence to the EHEA. The changes of generation and transmission of knowledge within the emerging „knowledge society” requires also new concepts in academic training. Also the implementation of credits based on student workloads (the paradigm change from teaching to learning) implies new challenges for the lecturer. The changes should not be limited only to the didactical methods, but also to the procedures to design the study programs. Principles of teamwork, multidisciplinary and multiple forms of learning must be taken into account.

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Erik de Gier, John Warmerdam, Marjolein de Boer, Krista van Mourik
Institute for Applied Social Science, Radboud University Nijmegen, Hollandia

The Appearance of Innovation Paradoxes in the Dutch Knowledge Economy and the Role of Higher Education

SHORT DESCRIPTION

Policy actors in the Netherlands are aware of the need to anticipate on the coming knowledge society. According to the dominant discourse, the Netherlands wants to belong to the group of top performing countries in the European knowledge society. As the biggest threshold in realizing this is seen the so-called innovation paradox or problem to transfer scientific knowledge to practice. Searching for explanations for the difficulty to resolve the innovation-paradox the existing system of higher education as well as the way it is financed play an important role. What seems to be needed is a reform of higher education from a mainly bureaucratic factory system to a less regulated dynamic network system in which knowledge is freely accessible for everyone. The main task of the future higher education system will be teaching students of all age groups how to deal and work with knowledge in a creative manner. In this context life long learning is strongly promoted. Furthermore, the infrastructure for technology transfer should be improved as well as the relationships between higher education and research institutes, the business community and wider society.

The existing system of higher education contributes to maintaining important social inequalities such as unequal access to knowledge, the unequal position of ethnic minorities and the almost exclusion of older people. This waste of talent is another reason for the urgency to transform the system of higher education and to bring it more in conformity with the exigencies of the future knowledge society. That is mobilizing all available talents in Dutch society. Apart from that, in the context of the globalized knowledge based society some more specific labour market risks are perceived, such as the increasing gap or social divide between low educated and high educated workers and the incidence of critical transitions in the life course of all categories of workers.

1. Introduction

This article summarizes the main findings of the country study of the Netherlands in the context of the globalized knowledge-based society, new social risks and universities. The aim of the study is to analyze:

- The state of art in different European countries.
- To examine the approaches of the reforms.
- To revise the findings about the consequences of the reforms in order to derive a description of the role of the higher education in the European Social Model.
- To contribute to the design of long term strategy concerning the future of higher education in Europe and the social cohesion of the EU.

The main pillars of the New European Social Model as there are: employability, social inclusion and equal opportunities. The text proposes to revise the reference model of the Lisbon Strategy – the knowledge based society and economy – and to explore emerging new social inequalities based on the disability and the use of knowledge in the emerging model of society, to look for the contribution of the universities to combat the new forms of social exclusion and to elaborate a model of higher education in the globalized knowledge-based society.

Three themes will be central in this country case study:

1. *The discourse of the knowledge economy in the Netherlands*
2. *The perception of (new) social risks in the Netherlands*
3. *The role and functions of universities and polytechnics in the Netherlands.*

The article is primarily directed at reviewing the discussion of the knowledge-based society in the six selected EU member States and on empirical findings of the transition process. A second objective is to revise how European society perceives (new) social risks that go together with the transition to the knowledge-based society.

Finally, a third objective is to detect which functions in the transition process more in particular are assigned to academic as well as to professional universities or polytechnics.

2. Method

The method used in this study is primarily desk research of relevant documents, available national statistics, and empirical research findings, supplemented with some interviews with relevant stakeholders. In advance a questionnaire guideline was developed. This guideline was used both in the literature search as in the interviewing activities.

3. Problem

In the Netherlands the actual debate about the knowledge economy very much deals with the present and future innovation capacity of the Dutch economy as compared to other industrialized countries. The context of this debate is the EU-innovation policy, directed at for example market dynamics, the innovation of the public sector and the reinforcement of regional innovation politics. The EU-innovation policy is set within the context of the Lisbon –, Bologna– and Copenhagen-objectives on the European Social Model, higher education and professional education respectively. The rather newly created (Dutch) Innovation Platform (See Box 1), chaired by the prime minister, is intended to be the main engine of the national debate on innovation and the knowledge society and is also coordinating this debate.

Box 1: The Dutch Innovation Platform

The Dutch Innovation Platform:

Initiated in 2003 by the prime ministers' cabinet office, with the purpose to leverage the Netherlands into the international top five with regard to higher education, research and innovation.

The innovation Platform will do this by assessing the actual knowledge and innovation system and by creating the proper conditions necessary for innovation and entrepreneurship.

The Platform consists of the prime minister (chairman) and a number of key players in politics, industry, science and education.

Participating in this debate is a number of stake holders, such as employer and employee organizations, representatives of multinationals and small- and medium sized businesses and finally a number of advisory councils directly linked to the Dutch corporatists socioeconomic system (such as the Social Economic Council, SER) or advisory councils more directly linked to the

government and consisting of experts (such as the Scientific Council of Government Policy, WRR, the advisory council for science and technique, AWT and the Government Bureau of Policy Analysis, CPB).

Also, a number of ministries, such as the ministry of Economic Affairs (minEZ) and the ministry of Education and Science (minOCW) play an important role. At first sight, this seems to be a rather complicated institutional pattern. However, as it will turn out later, there is a large area of consensus among the stakeholders about the way and manner the Dutch economy and society needs to anticipate on the knowledge society.

4. Themes

4.1. Introduction

First of all, we will synthesize the actual debate in the Netherlands about the knowledge economy. Then, our attention will shift to the actual perception of social risks. Finally, we will focus on the role and functions of universities and poly-techniques.

4.2. Discourse of the Knowledge Society

As has been stated yet, in the Netherlands the debate about the knowledge society very much concentrates on the innovative capacity of the Dutch economy. One of the main problems perceived in this respect is the existence of a so-called knowledge paradox or innovation paradox. The best circumscription of this paradox is that the Netherlands, as compared to other industrialized countries as such has a very good record in collecting scientific knowledge for the public domain, whereas at the same time the country doesn't seem to be able to transform this knowledge adequately into economic growth (Van Asseldonk 2004). As a consequence the Dutch economy is comparatively lagging behind with respect to innovation. It is the task of the Innovation Platform (IP) to tackle this problem by proposing new policy initiatives to the government. The IP sees five causes for the relatively backward position of the Netherlands:

1. Low public and private investments in knowledge. The Netherlands annually invests 12 billion euros less than the top three of investors and also remains behind the OECD average.

2. On the whole there is not a very favourable climate for innovation because vesting interests are strong. Because of that innovative entrepreneurship

is not sufficiently stimulated. The same holds for the influx of young talent in science and industry.

3. There is still a strong egalitarian culture in the country, implying uniformity in education, work payment and work place performance.

4. Needed are improvements in the linking of the knowledge and innovation systems, more in particular between public and private players. An important success factor in this respect is mutual trust.

5. An integral strategy with respect to knowledge and innovation is lacking. In the past decade much public effort has been put in 'activating the labour force' and reducing unemployment. This has to be supplemented first and foremost, by 'activating talents' (Innovatieplatform 2006).

A key document of the Innovation Platform is the so-called *Knowledge Investment Agenda 2006 – 2016* (Innovation Platform 2006). In this document the IP sets out its ideas about innovation. The main focus indeed is on activating or a better use of human talents in the knowledge society. With better use is meant, more specifically ... '*activating and vitalizing of talents of all people in all parts and layers of the Dutch population*'.

In the end the purpose is to re-instate the country in the top league of dynamic knowledge economies in the OECD.

A balance sheet of the actual state of affairs shows at the benefits side the following positive points:

- In general Dutch pupils score reasonably or good on international school tests. The performance of primary and secondary education therefore, is reasonably good;

- Internationally seen, the Netherlands has relatively low youth unemployment;

- Productivity of Dutch scientists is good, inclusive the number of international citations.

If we look on the other hand to the costs, a number of structural problems become visible, such as:

- Language skills of a number of pupils are underdeveloped at the moment they enter primary education;

- Early dropping out of the school system is substantial;

- Tertiary professional education is insufficiently linked to secondary professional education;

- Only one of all Dutch universities is ranked among the fifty best universities in the world;

– Participation in post-initial training is low for the low-educated, the elderly, women and non-working people;

– The number of graduates in sciences is relatively low.

To be able to combat the above mentioned deficiencies the Innovation Platform proposes a strategy directed at the whole chain of knowledge, from pre-education until innovation and entrepreneurship. This strategy has to consist of the following three parts:

a) a maximal educated working population during the whole working career and life course;

b) an outstanding knowledge base, including a prominent research infrastructure and adequate provisions for young scientific talent;

c) creating a stimulating entrepreneurial climate by taking measures with respect to management skills and organizational culture (social innovation), lowering administrative burdens and rules and stimulating innovation by investment in R&D.

The Knowledge Investment Agenda contains a number of practical proposals relevant for all stakeholders involved, but in particular also for the actual government. Government is proposed to increase investments for education and research to an additional annual level of 3 billion euros in the coming eight years, spanning two cabinet terms.

The money to be invested has to be spent on four themes:

1. Financial means for universities have to be distributed more on the basis of quality and less on the bases of the number of students per university. At the same time, there has to be invested more money in research infrastructure; the influx of young scientific talent, also from abroad, has to increase, and finally science and industry will have to increase and widen their interaction;

2. The Netherlands has to make choices for big research facilities that can compete internationally;

3. The accessibility of the country for foreign knowledge workers has to be increased;

4. Scientific knowledge has to be used more effectively (Borst a.o. 2007).

Before publishing its *Knowledge Investment Agenda* the Innovation Platform consulted all relevant stakeholders and private parties, inclusive the big multinational firms. The degree of consensus about both the diagnosis and the improvement strategy proposed by the Innovation Platform proved to be high.

If we look beyond the official discourse of the knowledge society, the resulting picture becomes a little bit more colored.

The Innovation paradox indeed is one of the greater problems with which the Dutch economy and society are wrestling. Collecting knowledge in the science field through academic research is rather well developed, but at the same time a substantial part of Dutch industry is not able to apply this knowledge in a proper way (Leijnse 2007_interview). This mostly concerns small- and medium sized business. The problem might be caused by a lack of sufficiently proper translation instruments or mechanisms from the academic world to industry. But it is also caused by cultural factors (See Box 2).

Box 2 An example of local transfer of academic knowledge to practice

Radboud University Nijmegen is one of the multidisciplinary Dutch research universities. It therefore consists of 9 faculties and some 22 specialized fundamental and applied research institutes. In its most recent Strategic Plan 2005–2009 '*The power of Quality*' societal impact of fundamental research and knowledge is explicitly mentioned as an important objective of university policy. Radboud University has the absolute intention to make a direct contribution to the new knowledge-based economy through different types of activities and also by collaborating with major corporations and the establishment of spin-off companies.

Relevant activities in this respect are, first of all, enlarging the amount of applied research activities in behalf of third parties (by stimulating 'academically enterprising' of all research groups) and the valorization of educational activities and organizing postinitial educational. Also important are: the introduction of an internal patent regulation which is also beneficial for the research group and the individual inventor(s) involved, knowledge protection by IPR's and activities directed at initializing spin-off companies. With respect to spin-off, the university belongs to the national top-3 scorers of universities initializing spin-off companies (since 1985 on the whole some more than 300 spin-off companies have been created). At the campus site of Radboud University several supporting activities and facilities exist for spin-off companies. For instance, there is a spin-off help-desk at *Mercator Incubator Nijmegen*, which cooperates with regional authorities and the business community. Recently also the so-called *Innovation Lab* was opened for spin-off initiatives in the field of the natural sciences. Apart from this, some other lab- and housing facilities are available for spin-off activities. Next to this, to support so-called techno-starters, in 2006 *Knowledge Exploitation Radboud Nijmegen* (KERN) was initiated. In KERN the university narrowly collaborates with the Academic hospital UMC, the Arnhem/Nijmegen Polytechnic, local and regional government and the business community. KERN has been granted a four-year budget of about 5 million €, matched on a 50/50 basis between the university and the Dutch ministry of Economic Affairs. As a result yearly 10–20 technological spin-off companies are successfully initiated, for the biggest part by young promising researchers.

The guiding idea behind all these activities is the adding of value and ‘valorization’ of scientific knowledge (that is the process of disseminating and exploiting project outcomes to meet social needs). Compared to other Dutch universities the performance of Radboud University concerning the valorization of knowledge is substantially high. Radboud University also belongs to the top-3 universities with the highest part of contract activities in behalf of third parties.

Sources: Strategic Plan 2005–2009&2006 Research Report, VanderPasch 2007_interview.

As has been said, conservative vesting interests are strongly developed in the Netherlands, both at the demand side (industry) and at the supply side (academic research) and these don’t offer the best fertile soil for innovation. Research shows that only 25–50% of innovation in industry is mainly dependent from technological knowledge as such and the remaining 50–75% from what is called *social innovation* (Volberda a.o. 2007). Social innovation is defined as changing a firm’s organization, management and labour in a way that is new to the organization and/or the industry, with the effect of leveraging the firm’s technological knowledge base and improving organizational performance. Social innovation delivers the following benefits to organizations: flexible organizational forms, dynamic rather than routine management practices with a large absorption capacity and readiness to learn, a willingness to invest in employees and full deploy internal as well as external flexibility, openness to interaction with external partners and various knowledge institutions and mobilization of institutional stakeholders, from social partners, educational institutions to financial investors (Volberda a.o. 2007). In this perspective the focus on activating talents of the Innovation Platform can at the same time be seen as a form of social innovation in Dutch society.

On the other hand the actual system of knowledge production is not organized in a flexible and dynamic way. At the public side this system is based on 14 mainly publicly financed universities and a bigger number of polytechnics. The two layers of higher education are not integrated, but separate systems between which there is no extensive interaction. Universities focus on scientific education and scientific research, whereas the polytechnics specialize in professional education and applied research. According to Leijnse, this binary higher education system is in present form not very well suited for the challenges the knowledge society brings with it. In section 4.4 we will come back on this.

Summarizing this section on the discourse of the knowledge economy in the Netherlands, first of all we can conclude that the Netherlands has a strong ambition to belong to the top league of best performing knowledge economies in the EU. At the same time, the production of knowledge to be applied for

innovation purposes is not the problem. The real problem is the still existing big gap between knowledge production on the one hand and knowledge application in industry on the other hand. This 'innovation paradox' hinders the innovative powers of Dutch industry, in particular of small and medium sized businesses. The main explanation for the existing gap is threefold: the still dominance and persistence of conservative vesting interests both in industry and in higher education, an inner directed and also conserving attitude of a large part of Dutch industry, and finally, the sustaining persistence of a binary, divided and more or less obsolete institutional system of higher education in the Netherlands.

All this brings the Innovation Platform as well as all parties involved to the conclusion that to overcome these problems first of all a strong strategy of activating talents, inclusive top talents, in Dutch society has to be developed. The social risks that we will describe in the following section all are linked to the challenge of activating talents.

4.3. Perception of (new) Social Risks

A meticulous and extensive literature search (De Boer&Van Mourik 2007) brings us to the following preliminary list of (perceived) new social risks in relation the upcoming knowledge society:

- a) Insufficient and unequal access to information and knowledge for certain social groups (Leijnse 2007);
- b) Study performance of immigrants in secondary and higher education is behind that of nationals (OECD 2007);
- c) Weak national commitment to life long learning for all age categories. Accent on students below the age of 28 (OECD 2007);
- d) An increasing gap or social divide between low educated and high educated workers (De Gier 2007);
- e) Critical labour market transitions during the life course (De Gier 2007b).

(a) Insufficient and unequal access to knowledge for certain social groups

Leijnse put forward the question that in the Netherlands there is a strong and myopic identification with the need and availability in Dutch society of top talent. This one sided identification with top talent disadvantages some social groups with respect to access to knowledge. The main focus of universities and polytechnics is on young people that enter higher education after finishing secondary education. Disadvantaged groups here are in particular elderly people and elderly workers. They have almost no chances to get access for the first or

second time to the higher education system once they have reached a working life status. As a consequence they will not be able to continuously developing their talents and employability. Apart from that, knowledge is not freely available to everyone. As such it is not a free public good. For this reason, Leijnse pleads for an *open source approach* for knowledge in the knowledge society. Internet offers all technical possibilities to organize knowledge via open sources that is freely accessible for each citizen (Leijnse 2007_interview). Open access to knowledge and information will not be sufficient to solve this risk. People in all age groups have to be able to work with knowledge in the information society. That implies that people have to be learned the right skills to deal and work with knowledge. If a society doesn't succeed in this, there will develop a big social divide between knowledge workers being able to work in a creative way with knowledge and information and workers that don't possess the proper skills.

(b) Study performance of immigrants in secondary and tertiary education is behind that of nationals

A recent extensive thematic review of Dutch tertiary education carried out by the OECD showed considerable deficiencies in the participation of ethnic minorities as compared to nationals (OECD 2007). Ethnic minorities, actually, not only participate less in the tertiary educational system, but also perform less. In particular, completion rates for non-western immigrants are lower than for other population groups. In addition, once ethnic minorities take part in tertiary education, they have a strong preference for polytechnics and much less for universities. This form of undesired segregation may be the result of selection processes that already start in primary and secondary education. A little bit overstated one could say that two different streams of pupils and students develop from primary schools to higher education, a *black* stream and a *white* stream (Vink 2007). The black stream contains students with an ethnic minority background and develops along the line of lower and middle professional education to polytechnics. In contrast, the other (white) stream develops along the line of pre-scientific secondary education to universities.

In former times the Dutch educational system also contained clear second chance opportunities for those people who failed or underperformed during initial education. These were abolished in the past. If these opportunities still existed they could play an important role in overcoming the actual segregation tendencies (Rinnooy Kan 2007).

As a consequence, this not only is a clear and sustainable social risk for ethnic minorities, but also implies a certain amount of waste of human talents in the knowledge economy.

It must be stated that over time participation of non-westerners is increasing, both in polytechnics and universities. In 2004 7748 non-western immigrants went to a polytechnic, which equals 13,4% of all polytechnic entrants; and correspondingly 2242 non western immigrants went to the university. This figure equals 8,2% of all university entrants in that year.

(c) Weak national commitment to life long learning for all age categories

The same thematic OECD review pointed to another deficiency in the system of tertiary education in the Netherlands (OECD 2007). That is the almost total neglect of programs directed at life long learning. The tertiary system is focused on the age group 18–30 years old and almost doesn't serve older age groups. There are a small number of exceptions with respect to some part-time initiatives and there also is a possibility to go to the Open University which is specialized in distance learning. Enrolment in higher education beyond the age of 30 is roughly half of the OECD average. About 15 percent of the working population actually participates in activities that might be classified as belonging to life long learning. This corresponds to the European average. At the same time countries like Sweden, Denmark, Finland and the UK are performing substantially better. An additional problem in the Netherlands is that the majority of the courses offered has a functional and applied character and doesn't really contribute to the acquisition of legally recognized certificates or diplomas. Therefore, their significance in terms of investing in sustainable life long learning activities is still rather limited. The main explanation for this is twofold. Firstly, a national future-oriented strategy with respect to life long learning is almost absent, and secondly, companies as a rule do not stimulate their workforce to do courses alongside working (Platzer 2007).

The need for both government and industry to play a more active role in this field is increasing because for the next decade a shortage of higher educated is forecasted. In 2020 probably there will be a shortage of higher educated people in the Dutch economy of 200 000. Apart from that, more extensive life long learning activities contribute to better work chances for and mobility of the low educated, immigrants and older workers.

(d) An increasing gap, or social divide, between low educated and high educated workers

Labor market policy in the Netherlands is focused on activating the labor force as much as possible within the context of the Lissabon goals and the European Employment Strategy (EES). In 2010, 70 percent of the whole labor force will have to carry out paid work actively. The accompanying strategy of transforming the more traditional redistributive *welfare state* into a so-called

activating participation society was initiated in the beginning of the nineties, a time with high unemployment and disability figures in the Netherlands. This strategy mainly contains of a mixture of limiting substantially entitlements on social security (unemployment benefits, disability benefits and curtailing the possibilities of early exit for older workers) and a further development of active labor market policies (in particular by introducing temporary subsidized work and financial incentives in the social security and tax system and reforming the administration of social security and the public employment services) (De Gier 2007a).

In principle, this change of strategy in general has been very successful until to-day. The number of beneficiaries has decreased not only with respect to unemployment and disability benefits, but also to some extent with respect to social assistance (for the long term unemployed people). However, some difficult to resolve problems still remain. Firstly, despite a decrease in the supply of low educated workers on the labor market in a context of a stabile or even increasing demand of low educated workers, the socioeconomic position of the low educated workers did not improve across a longer time span, as might have been expected. Chances to become unemployed are twice or even three times higher as the chances of the high educated workers. Secondly, a large group of active low educated workers in industry and services is increasingly becoming dissatisfied because of a rather permanent pressure on their purchasing power related to increasing prices and rapidly rising and sometime excessive earnings of their bosses. For this group at this moment the activating participation society is perceived in terms of downward mobility instead of better occupational foresights. In sum, the transformation of the welfare state into an activating participation society for the moment is not beneficial for the low educated working and unemployed people. Their chances for upward mobility on the labor market are blocked to a large extent. For the biggest part, the benefits go to the high educated workers (De Gier 2007b).

(e) Critical labour market transitions during the life course

State policy directed at realizing an activating participation society that fits well with a globalized knowledge-based society, also implies making workers as such less vulnerable on increasingly flexible labour markets. Job security has to be exchanged for work security, creating a situation in which regular and successful job hopping becomes the standard instead of life time contracts. In fact, at the moment existing institutional worker protecting arrangements are limited or abolished in the field of social security and dismissal protection with the intention to increase labour mobility. In this context, all categories of workers will be particularly prone to social risks (or critical

incidents) that might occur during transition periods on the labour market, such as from school to work, from fulltime to part-time work, from employment to unemployment, from caring to employment and from employment to retirement (De Gier 2007b).

4.4. Role and Functions of Universities and Polytechnics

It seems obvious that one of the main conditions to solve the innovation paradox in Dutch society will be to overcome the deficiencies or at least to improve the existing binary system in higher education (universities and polytechnics). A potentially promising approach according to Leijnse might be to de-institutionalize the existing system of higher education and to transform it subsequently from a rather homogeneous system of comparable universities and polytechnics into a real network structure in which both universities and polytechnics are linked by means of high performing research and educational knowledge centers. In this context knowledge has to be defined as a productive factor. A flexible network structure in his view will be better equipped to teach students in a more dynamic and challenging context how to deal with complex knowledge and innovation. A far-reaching reform of the higher education system will also contribute to preventing the (new) social risk not being able to deal properly with the increasing availability of knowledge in society (Leijnse 2007 – interview).

However, this is not the only problem with respect the higher education system. Nauta, former participant in the Innovation Platform and lecturer of Innovation of the Arnhem-Nijmegen Polytechnic, criticizes the actual incentive structure as well as the financial system with which universities in the Netherlands are financed (Nauta 2007_interview). To begin with the latter, very important in this respect is the so-called first money stream. This is money meant to stimulate scientific academic research and scientific education on universities. To a large extent the existence and continuity of universities is dependent from this money delivered and distributed by the state. In addition universities compete for public research money that is redistributed via the National Science Organization (NOW) and also for money for contract research coming from private sources (industry, services) and from other more specific public sources (ministries, municipalities). Contrary to the still less important additional money streams, universities don't have to deliver a more precisely circumscribed research and educational output. So, this part of the output is debatable according to Nauta, from the viewpoint of the knowledge society. This part of their output hardly contributes to solving the existing innovation paradox. At the same time, in his view, polytechnics are caught in educational obligations

and for that reason hardly contribute to innovative education, research and applications. A second deficiency in higher education is the shortage of incentives to stimulate entrepreneurial and risk-taking behavior of teaching and research staff. In the eyes of Nauta this type of behavior is a crucial precondition for technological innovation. Apart from the incentive structure, also a proper infrastructure for effective technology transfer from universities to industry is fairly absent in the Dutch higher education system. Compared to Oxford University, Cambridge University, Stanford University and Louvain University, Dutch universities seem to be rather lethargic.

5. Conclusions and Debate

The Netherlands is aware of the need to anticipate on the coming knowledge society. Even more, the Netherlands wants to belong to the group of top performing countries in the European knowledge society. As the biggest threshold in realizing this is seen the so-called innovation paradox or problem to transfer scientific knowledge to practice.

Searching for explanations for the difficulty to resolve the innovation paradox the existing system of higher education as well as the way it is financed play an important role. This system is not sufficiently equipped for the knowledge society because it confirms to much vested interests. The system seems to be caught in the predominance of daily obligations.

To overcome the most important impediments, the Innovation Platform has been founded. Although this platform plays an important role in the debate about the future of the Dutch knowledge society, it is not acting as a change agent. What seems to be primarily needed is a far reaching reform of the system higher education from a mainly bureaucratic factory system (OECD 2007) to a less regulated dynamic network system in which knowledge is freely accessible for everyone. The main task of the future higher education system will be teaching students of all age groups how to deal and work with knowledge in a creative manner. In this context life long learning, consisting of a combination of formal learning and practical competence building has to play an important role.

In the same context the infrastructure for technology transfer has to be improved strongly. The best precondition to realize this is to introduce a more rewarding incentive structure for teaching and research staff at universities and polytechnics. The incentive structure will have to catalyze a more entrepreneurial and risk taking attitude of knowledge workers in the higher education system. Much can be learned in this respect from foreign universities and also from some other countries.

The existing system of higher education contributes to maintaining important social inequalities such as unequal access to knowledge, the unequal position of ethnic minorities and the almost exclusion of older people. This waste of talent is another reason for the urgency to transform the system of higher education and to bring it more in conformity with the exigencies of the future knowledge society. That is mobilizing all available talents in Dutch society.

Apart from that, in the context of the globalized knowledge based society some more specific labour market risks are perceived, such as the increasing gap or social divide between low educated and high educated workers and the incidence of critical transitions in the life course of all categories of workers.

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