

Working Group V

Working document 23

**Working group V « Complementary Competencies »**

**Subject :     Note by Mr Danny Pieters, Belgian Alternate Member of the Convention**

**Policy statement**  
**Research policy in the knowledge society**

**Summary**

It is important for the Convention to make clear that the complementary competences of the European Union in relation with research:

- relate to all research, basic and applied, including research based teaching;
- should provide tools to remove existing barriers to the mobility of researchers;
- should enable the creation of an Independent Agency for Quality Assessment and Benchmarking;
- should endorse the strengthening of research and innovation by setting a target for all member states of 3% of GDP for spending on research and development;
- should enable the development of a European publication environment.

**1. The knowledge based society**

The 21st century will undoubtedly be characterised by a knowledge based society whereby science and science education will dominate more than ever before the economic, social, cultural and political context of our society. It will affect the existing balances at nearly all levels of our society: anchoring of economic activity will to a larger extent than ever before depend on the availability of intellectual resources and human skills. The existing procedures of learning, working and commerce are changing and even our democracy will benefit from new applications of the communication and information technology.

As in the past, ample supply of material and energy resources, capital and people will remain important but knowledge will become a more dominant factor in the creation of wealth and welfare. However, knowledge creation and dissemination is less restricted by historical borders and can create a different mode of competition behaviour between regions, countries and continents. Participation in this

knowledge society requires a balance as well as a strong interference between knowledge generation and knowledge diffusion :

+ **Knowledge generation**

A number of measurable ‘Science and Technology Indicators’<sup>1</sup> clearly indicate that on the one hand the scientific position in general and particularly the publication output of research in Europe is relatively strong. On the other hand, however, the indicators clearly identify some weaknesses in comparison to USA and Japan, particularly:

- Total R&D expenditure in % of GDP: USA (2.62 in 1999) and Japan (2.91), are investing much more in research than Europe (France: 2.17, U.K.: 1.87, Germany: 2.44 ...);
- The number of researchers per 1000 workforce: the number of researchers per 1000 workforce is more than 8 in Japan and the USA; For Europe: in Germany and France: 6.1 and in the UK: 5.5;
- The number of patents per million population is substantially higher in Japan and than USA than in Europe.

On the longer term, this unfavourable position will harm the strength of the European scientific system and its dynamism to generate new insights, new products, procedures and services. The knowledge society, which is strongly driven by its different stakeholders who want to implement new developments, can only be sustainable if knowledge is systematically renewed. This attempt asks for front edge research at the frontiers of the existing knowledge.

+ **Knowledge transfer and knowledge diffusion**

The efforts of universities and high schools in the scope of traditional teaching and life long learning remain of utmost importance. Nowadays however, scientific knowledge and technological know-how are no longer the sole result of the activities of universities or research institutions. They are produced

within a very broad spectrum of organisations and structures and of networks encompassing research bodies. As mentioned above, knowledge originating from the knowledge society is used by different users at different levels: in every day life, in commerce, industry, labour, governance, etc. Therefore, teaching in general and ‘research teaching’ in particular are becoming more and more important in the scope of the progress of the knowledge society. ‘Research based training’ aims at transferring to the next generation the most advanced scientific insights and especially the attitude and skills necessary for creating innovative researchers.

Therefore, research based training is the best guarantee to maintain the quality of European research as well as to facilitate and enhance the implementation of new research outcomes. Statistics<sup>2</sup> indicate that in the new knowledge based economy, the availability of high quality human resources is essential. In Europe however, the presence of researchers in the total EU workforce (5.3 per thousand workforce) is considerably below that of Japan (9.3) and the USA (8.1). Particularly the number of PhD graduates in science and technology should further increase to bridge this gap, their research training should be prolonged and include a more ‘in depth’ approach.

---

<sup>1</sup> Towards a European Research Area, Key Figures 2001, Special edition ‘Indicators for benchmarking of national research policies’, Luxembourg : Office for Publications of the European Communities, 2001, ISBN 92-894-1183-X

<sup>2</sup> ‘Frascati manual’: chapter 2 : Basic Definitions and Conventions

“Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.

R&D is a term covering three activities: basic research, applied research, and experimental development (described in detail in Chapter 4). Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. Applied research is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective. Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience, that is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.”

## 2. Towards the realisation of the knowledge society

In the scope of the envisaged generalised participation at the knowledge society, it is essential that one should encourage the full access to new knowledge with the objective to implement new technologies with economic, social and cultural benefit. Europe should further develop a research policy approach that gives support at the level where it creates the highest added value.

One of the basic questions is whether the sum of the efforts of the individual member states towards creating the knowledge society will be sufficiently effective? Are the European actions oriented towards the domains with the highest European added value? Are the existing and proposed instruments in the scope of Sixth Framework Programme effective? The new concept of the European Research Area includes a number of answers to these questions. The objectives of ‘focusing’, ‘integrating’, ‘structuring’ and ‘strengthening’ research in so-called ‘networks of excellence’ and ‘integrated projects’ as well as the further enhancement of the Marie-Curie Scheme and the ‘European research infrastructures’ are extremely important and urge the actors in the field to organise themselves in a more European oriented way.

In our opinion, however, the developments of the knowledge society still ask for additional policy concepts in order to let society benefit from new knowledge in the most effective way.

Therefore, a revision and renewal of some basic approaches of European research policy should be taken into consideration:

### + **“Research”: the complex effort towards knowledge generation**

Following Article 163 of the EU-treaty “Community research shall have the objective of strengthening the scientific and technological basis of community industry encouraging it to become more competitive at international level ...”. This article puts much emphasis on application oriented research: the outcome of European research efforts has to provide a relatively direct impact to industry. In contemporary scientific research however, the distinction between

basic and applied research (cf. Frascati Manual<sup>3</sup>) is becoming artificial. In addition, the knowledge base (being basic as well as applied research) of an organisation or firm will influence its growth potential, its investments and its partnerships.

Furthermore, one should not underestimate the importance of the ‘human’ factor in this process: the contribution and participation of individuals to the knowledge society depends on a large number of aspects: education, social environment, health, attitude towards other cultures (particularly in Europe), ...

Therefore, “research” should no longer be subdivided in certain phases of the knowledge chain. Basic and applied research should be approached as two properties of the same material.

+ **Research based teaching**

Teaching can be defined as the accumulation of knowledge, specifically of skills, through the formal process of learning through education. Research, particularly research of public nature, is the accumulation of ideas, originating from the brains of well-trained scholars. The interaction between ‘education’ and ‘ideas’ is an essential cornerstone of the knowledge society. Therefore, the European wide policies with respect to teaching and research should be taken into consideration. Particularly, research intensive universities and research institutions, whether public or private, have the potential to contribute to this challenge, since they guarantee the interaction between research and teaching in the most intensive way.

Efforts in the scope of research teaching within the EU should be organised at each level but when appropriate the EU should play an active role in the research education activities that require supra-regional or supranational organisations because of reasons of scale, costs or other international requirements.

+ **Mobility of researchers and capacity building in Europe**

The exchange of qualified researchers within Europe, the facilitation of mobility of researchers from non-EU countries, the development of challenging career perspectives, standardised procedures with respect to intellectual property, and other efforts to improve the research environment, are of key importance to make universities and research institutions attractive for research talent. This will reduce or even reverse certain tendencies towards ‘brain drain’ and it will help European universities and institutions in their efforts to attract highly qualified researchers.

Mobility of researchers in Europe is hampered by a number of problems, such as:

- Lack of knowledge of the local language, particularly for non-EU citizens (Eastern-Europe) coming to a member state with a less widely used language.
- Free movement of visa holders within the EU is restricted; attending a conference in another EU-country may cause problems!
- Status of family members is often unclear: are they allowed to take up employment or not?
- Differences in social security systems and levels of taxation in different member states may make it unattractive to move between countries with different social security and taxation levels.

+ **Budgetary objectives**

In the longer term, one may expect that new economies in industrialising countries will establish their own centres for knowledge development. The European knowledge centres should take into account that the ‘competition on the knowledge market’ is still growing very rapidly. Mobility of scientists and knowledge in the modern internet world can lead to a relatively fast change in the existing balances. Europe is still at the forefront of scientific progress, but its historical strength in scientific research is more 'volatile' than it ever was.

In order to maintain Europe's level of scientific excellence, it is desirable and necessary that the investments of our countries in R&D become a common top

priority, comparable to the financial objectives that were imposed to create the European Monetary Union. ‘The Lisbon strategy – making change happen’<sup>3</sup>, already concluded that **“the European Council should endorse action to strengthen the European area of research and innovation by setting a target of 3 % of GDP for the overall level of public and private spending on research and development by the end of the decade.”** It is of the highest importance that this strategy should be elaborated and implemented in practice.”

### **3. Implementation**

Up to now, fundamental and basic research resorted under the authority of regions and member states, whereas the European Union focussed on precompetitive research. The new context of the knowledge society mentioned above, makes this division of authorities outmoded and ineffective. A more structural support of European top research should be taken into consideration.

The new instruments of Framework Programme 6, particularly the Networks of Excellence, already anticipate on this point. Integration of knowledge, capacity building, exchange of scholars and the establishment of (virtual) thematic centres bringing together European top scientists are powerful tools in the world-wide competition on the knowledge market.

#### **+ Independent Agency for Quality Assessment and Benchmarking**

The European Research Area harbours a large number of ‘good’ research centres and universities. In the global competition however, ‘good’ should be transferred in ‘excellent’ and the growth of these excellent (virtual) centres or networks should strongly be supported. The interference between knowledge generation and knowledge diffusion (cf above) should further be stimulated within so-called ‘Research Intensive Universities’ with both high level research as well as advanced ‘research education’. A quality based financing system, based upon a set of measurable parameters, should be taken into consideration.

---

<sup>3</sup> Communication from the Commission to the Spring European Council in Barcelona COM(2002) ‘The Lisbon Strategy – making change happen’



Therefore, European bench marking effort, carried out by an independent agency, is highly desirable to identify per field of science the excellent research groups and networks.

In this scope, the quality reflected by the number of international publications, impact factors and citations, provides an important indication about research quality as well as an opinion about the global social, cultural and industrial relevance of the topic and its potential to create new developments and applications. The above mentioned Agency for Quality Assessment and Bench marking should develop general quality standards and evaluation mechanisms that make it possible to monitor the strengths and weaknesses of European research. The quality labels awarded to research units will have an indirect positive impact on further quality based networking and integration of high quality research in Europe.

#### **+ Development of a European publication environment**

The Action Plan ‘Science and Society’<sup>4</sup> already indicates: ‘If scientific and technological progress is to meet the needs of Europe’s citizens and regain their support, they will need to have information that is understandable and of high quality, as well as ready access to this specific culture.’

The language and cultural diversity of Europe is a wealth from many points of view, but it is also an additional barrier for knowledge dissemination. Therefore, appropriate efforts should be undertaken in the scope of vulgarisation of research, such as awareness-raising activities aimed at the general public and at young people in particular. At the same time, translation of scientific publications into less spoken languages should be taken into consideration, particularly those publications with a high ‘vulgarisation value’ and useful for science education at school.

---

<sup>4</sup> ‘Science and Society Action Plan, European Commission, Luxembourg: Office for Official Publications of the European Communities, 2002. ISBN: 92894-3025-7

+ **Improvement of mobility of researchers in Europe**

The renewed Marie-Curie Scheme offers exchange opportunities at all career stages (Ph.D. students, postdoctoral students, ‘sabbaticals’ for experienced researchers), which is an important improvement. In addition, the mobility towards host institutions belonging to a recognised ‘Network of Excellence’, previously selected by the EC will lead to more concentration, more sustainable competence building and to more added value in terms of science as well as in social/industrial relevance. However, the modalities with respect to social security and taxes have to be harmonised throughout Europe. A European directive on this point should be taken into consideration.

Third country researchers often face problems with visa, residence permit and work permit requirements. The procedures for obtaining official documents are mostly too slow, too complex and causing a lot of administration. As put forward by the High-Level Expert Group on Mobility, one should examine a European-wide implementation of **the French system of ‘scientific visa’** for third country researchers. Holders of scientific visa are exempt from working permits. Furthermore, a work permit is automatically issued for spouses.

+ **Implementation of Article 169**

The above mentioned instruments will contribute to more transparency in the European Research Area ERA: benchmarking will for each scientific domain give a survey of strengths and weaknesses, mobility towards top centres will be facilitated and a European publication platform will put further emphasis on the output of European research. An additional step forward is to open up the national research programmes, one of the objectives of the ERA.

The drive towards scientific excellence will undoubtedly give rise to different scientific orientation of the member states. Within this context, which will further be emphasised by the EU-enlargement, collaboration of a limited number of member states within a particular domain, should further be encouraged. The implementation of Article 169 will create a new flexible framework for research collaboration in Europe.

The proposed renewed approach of EU research policy will improve the research environment within the ERA and make scientific careers attractive; it will further increase both quality and capacity of European research. In the longer term, this will contribute to industrial innovations as well as to social, cultural and economic applications and integrate European diversity and multiculturalism into the knowledge society.

\*\*\*\*\*