



European Commission Socrates-Erasmus Thematic Network

ENHSA European Network of Heads of Schools of Architecture



European Association for Architectural Education

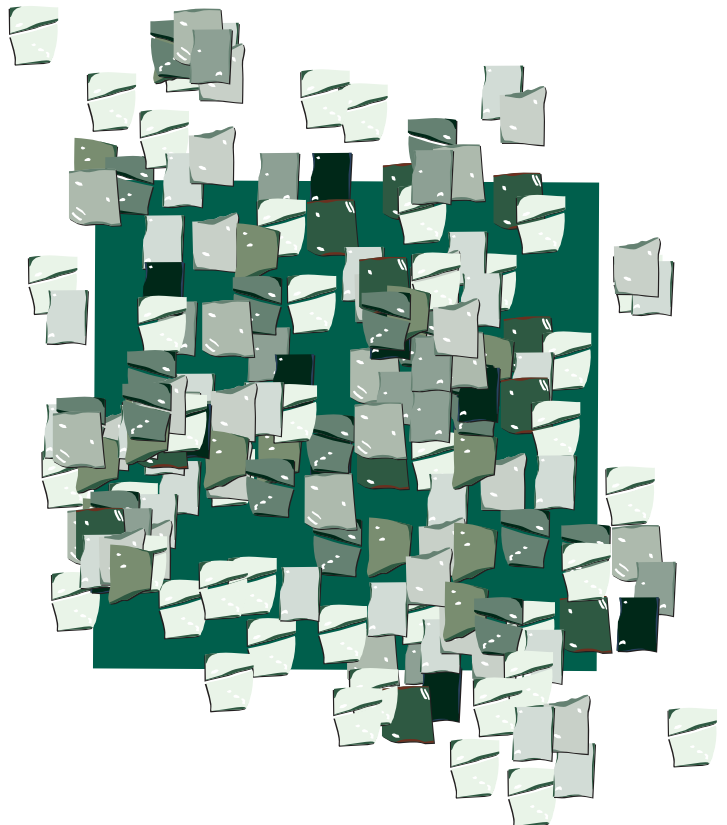
CMA Centre for Mediterranean Architecture

School of Architecture, Aristotle University of Thessaloniki

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Shaping Architectural Curricula for the European Higher Education Area



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We would like also to express once again our sincere thanks to the President of the Centre for Mediterranean Architecture Aris Papadoyanakis, Vice-Mayor of Hania and its Art Director Dimitris Antonakakis, who have kept our moral high with their understanding and warmth throughout the event.

In the organization of the programme of the event, Loughlin Kealy, Head of School of Architecture, University College Dublin, was a resourceful and inspirational partner. For that, we are deeply thankful.

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The organization of this event would be a much more difficult task without the moral and financial support of our School of Architecture, Aristotle University of Thessaloniki and its Head, Zoi Karamanou, whom we deeply thank.

We would also like to thank the Technical Chamber of Greece for its financial support for the organization of the music performance of the Meeting.

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Last but not least, we thank all the participants of this event not only for their faith in our efforts but also for their lively presence, constructive comments, participation in fruitful debates, and determination without which the materialization of our effort would be impossible.

Constantin Spiridonidis

Maria Voyatzaki

Preface

Shaping Architectural Curricula for the European Higher Education Area

Constantin SPIRIDONIDIS
Thessaloniki, Greece, EAAE/ENHSA Project Coordinator

1. What we have already done

The prospect of the creation of the European Area for Higher Education within the context of the Sorbonne-Bologna-Prague-Berlin process has constituted the central theme of all the past Hania Meetings of Heads of European Schools of Architecture. This prospect has triggered off our interest in getting to know better other schools of architecture and the persons involved in the decision-making for their future, and from this acquaintance to gain a deeper insight into our own schools and into our position in the European context of architectural education. What should we do about our schools in this new and increasingly changing social and financial context? What aims and objectives should we set and what strategies should we adopt to ensure their fulfilment? These are the fundamental questions for the answers of which our meetings pursue to create a constructive milieu.

For the creation of this milieu, our work went through various phases. In the debates that took place we critically followed the developments in the political context. We listened carefully to the positive as well as the negative considerations of the changes in the European context for architectural education. We managed to come to a unanimous agreement on the content of our own declaration: the Chania Statement. This crucial document set the framework for the principles of our debates, and at the same time it represented the views of one hundred schools of architecture, and conveyed them to all relevant national and European bodies. Moreover, from the debates we concluded that the nature of architectural education in the future is defined to a larger or lesser extent by the way in which these schools will deal with the four fundamental issues: firstly, the structure and content of architectural studies; secondly, the evaluation of the quality of school curricula; thirdly, the redefinition of the multifaceted professional profile of the architect of our days; and fourthly, the student and staff mobility, and the system of credits (ECTS).

For two consecutive meetings we focused our interest on these issues and we attempted to follow the various ways in which schools of architecture deal with them. We carefully mapped the points of convergence as well as divergence, the tendencies and dynamics, the particularities and differentiations. Through a thorough inquiry at schools of architecture, valid qualitative results yielded which could describe the nature and qualities characterizing a great number of schools of architecture in Europe. We continue to map the educational approaches and teaching methods in order to be able to draw a picture of the particularities of the European profile of education, but primarily to learn from the

others and to understand ourselves through this knowledge. Our efforts are gathered in the two volumes of proceedings generated from the last two meetings as well as in all volumes produced concerning the pedagogy of specific subject areas such as the two volumes of construction teaching, and the forthcoming volumes relating to the teaching of architectural design, urban design and conservation.

2. What we will do

In times of such fundamental changes, the importance of our meetings became apparent as they aim to integrate, develop and preserve a lively and dynamic milieu for communication, exchange and collectivity, and to cultivate creatively, with dialogue and collaboration, the future of architectural education in Europe. For such a milieu to be kept alive, it must not limit itself to the level of exchange of views and information but should be in a position to proceed in more constructive and creative syntheses. This is exactly the point on which the 7th Meeting of Heads focused this year. Its main objective was to schedule procedures for the development of tools and mechanisms which will more decisively support schools of architecture in their effort to be integrated in the European Higher Education Area.

More specifically, the 7th Meeting focused on the curriculum and in particular on its structure and the content of studies as these two parameters encapsulate answers to the question of quality, professional identity, and the dynamics of mobility. Whilst the system of studies in most schools of architecture in Europe comes from governmental bodies, educational structures and the content of studies are primarily issues dealt with by higher education academic institutions. The need for compatibility, comparability and competitiveness of higher education in Europe, as this is suggested in this new political context, requires reliable and objective information about educational structures and the content of studies, that is to say about the educational programmes we offer. We therefore urgently need new tools and approaches in order to be able to describe our curricula as well as to recompose them in the prospect of the reforms suggested by this new political context of the European Commission.

To better grasp the school curricula and to create the conditions for their comparability, the 7th Meeting focused on the learning outcomes and competences to be ensured by school curricula. By learning outcomes we mean the set of competences including knowledge, understanding and skills that a learner is expected to know/understand/demonstrate after completion of a process of learning – short or long. They can be identified and related to integral programmes of study and for individual units of study (modules). Competences are normally obtained in different course units and can therefore not be linked to one unit. It is, however, very important to identify which units teach the various competences in order to ensure that these are actually assessed, and that quality standards are met.

Competences can be divided into two types: generic competences which in principle concern the broader academic education of an architect and are to a great extent subject-independent and subject-specific competences. The approach to subject-specific competences is proposed to run in two parallel and complementary axes: The first axis concerns the competences related to the graduate skills to practice the various forms of the architectural profession as these are achieved by schools of architecture today. The second axis concerns the graduate competences related to research in architecture.

It goes without saying that competences and learning outcomes should correspond to the final qualifications of a learning programme. Competences are described as points of reference for curriculum design and evaluation, and not as straitjackets. They can allow flexibility and autonomy in the construction of curricula. At the same time, they provide a common language for describing what curricula are aiming at.

Learning outcomes and competences are the most relevant elements in the design, construction and assessment of qualifications ensured by schools of architecture, as they constitute the reference points to be met. It is of vital importance to discuss and agree on a rank order of learning outcomes and competences which will enable schools to structure their curricula. This way each school will be able to articulate their educational objectives as well as their reference points for quality assessment. In our effort, according to the principles adopted in the Hania Statement, we must not seek to develop any sort of unified, prescriptive, or definitive European curriculum, nor try to create any rigid set of subject specifications to restrict or direct educational content and/or to damage the rich diversity of European higher architectural education. Furthermore, we must not restrict the independence of academics and subject specialists or damage local and national autonomy.

November 2004

Welcome Speeches

Aris Papadoyanakis

Vice-Mayor of Hania, President of the Center for Mediterranean Architecture, Hania

Honorable Rector of the Technical University of Crete,
Mr. President of the Technical Chamber of Greece and Western Crete,
Distinguished guests,
Ladies and Gentlemen,

On behalf of the Mayor and City Council, as well as the Council of the Centre for Mediterranean Architecture, I welcome you to our beautiful city of Hania and this magnificent building, which is a typical example of local architecture and cultural heritage. The Meeting this year takes on a whole new dimension extending beyond the Centre for Mediterranean Architecture, which is already well-known, to encompass the opening of the new School of Architecture of the Technical University of Crete, which will open its doors to students from this academic year on. The 7th Meeting of Heads of European Schools of Architecture, along with your presence in this event, is a very big honor for this City and for the CMA. This event coincides with the recent developments in the European Union policies regarding architecture, the European Framework in Architectural Education and the European Framework of Higher Education. The work of this Meeting will be followed with great interest and it is our wish that the outcome will be constructive and fruitful. Finally, we wish to assure you in advance that the friendly City of Hania will be very pleased to host next year's meeting as well. Thank you very much.

Dimitris Andonakakis

Art Director of the Center for Mediterranean Architecture, Hania

Dear Friends,

I am particularly pleased to welcome you, on behalf of the Centre for Mediterranean Architecture, to Hania for the 7th time. This is not only because over the years most of you have cultivated strong bonds of friendship, but I also feel that the work you have generated throughout the years is bearing its first fruit regarding what you have achieved in the domain of architectural education, as well as regarding the influence and the impact that your Meetings have had on our City, which have ultimately led to the establishment of the new School of Architecture of the Technical University of Crete that will welcome its first students in a few days.

I would like to thank you deeply, particularly Constantin Spiridonidis for his contribution. Another reason, however, that I am particularly happy tonight is the reunion with an old friend and the potential that this occasion presents for creating new friendships. I am

delighted to have with us, Stanford Anderson with whom I had the honour of collaborating for several years at MIT. I am equally delighted that Kas Oosterhuis from Delft School of Architecture is also with us and, in this way, expressing a gesture of prospective collaboration. Thank you Stanford and Kas for accepting our invitation to warm-up the debates that are to come on this 7th Meeting. Welcome both to Hania!

Last, but not least, I would like to express my delight for the ongoing and fruitful collaboration with the European Association for Architectural Education and the continuous and generous support of the European Commission through the Socrates Thematic Network Programs.

Many thanks also go to the Technical Chamber of Greece for its financial support, the Union of Mayors of the Region of Hania and the Twenty-five For aid of Pre-historic and Classical Antiquities for their collaboration, which enabled us to offer you tomorrow's concert by the famous New Hellenic Quartet and the Mezzo Soprano, Mary Ellen Nezi in the superb ambiance of the ancient Aptera. I would like to thank all of you for these happenings in the City of Hania and I wish you all a fruitful meeting and a pleasant stay.

Constantin Spiridonidis

Aristotle University of Thessaloniki, School of Architecture, EAAE/ENHSA Thematic Network Coordinator

I would like to express a warm welcome to you, not as much as colleagues, but rather as friends. Yesterday evening, on discussing with Kas Oosterhuis about the way people feel about each other here, he made the comment that "this is not a conference, but a kind of reunion" because after so many years, we have not only achieved a number of things that are very significant from the viewpoint of our professional practices and experiences related to architectural education, but achieved something which is far more valuable: a good spirit of friendship and a profound ability to collaborate, exchange ideas and work as a team for the future of architectural education in Europe. These positive feelings are the motivation for our efforts in the framework of the European Association for Architectural Education. Sometimes, I think that this attitude can be seen as a kind of professional aberration, yet, in the end, this will for collaboration and group work in a common objective is something far more human and essential for the benefit of our professional practices.

Maria and I, who have worked closely at the organizational level for this event, would like to thank the Council of the EAAE for continuing to trust us in the task of organizing and for the support that we have received from them in the framework of this organization. I would like to thank as well the Centre for Mediterranean Architecture, particularly the Artistic Director, Dimitris Antonakakis, with whom we have had an excellent collaboration throughout the seven years due to chemistry or compatibility of characters, perhaps, although such cooperation is best appreciated rather than rationalized. I would also like to thank the Vice-Mayor of the City, who is also the President of CMA. It is worth mentioning that we have had the opportunity of working with many Presidents of CMA

and we have had an excellent experience of friendship, cooperation and fruitful exchange with all of them.

It is also fitting to thank the Administration of the Socrates Thematic Network that during the last three years has been the close supporters of our efforts in terms of the Association, which has created a new incentive and force, giving us the possibility to act and develop new activities under the auspices of the European Union. In addition, I want to thank all of you: the old colleagues who return year after year to this City, some for the 7th time, which is very encouraging. I would also like to thank the new participants who are ready to offer their collaboration and a new perspective for the future. I wish you a pleasant stay and, in terms of our debates related to this Meeting, may your participation be lively and productive, in a spirit of collaboration.

James Horan

President of the European Association for Architectural Education

It is with great pleasure that I welcome you all to the 7th Meeting in Hania. There is something specific about number 7. It seems to occur in mythology, in magic, in all sorts of stories and histories. Constantin mentioned earlier that there is perhaps a special chemistry between the Architectural Association and the Centre for Mediterranean Architecture. There is no doubt about the fact that there is, but I would go further, perhaps, and say that it is not just chemistry, but alchemy and there is a possibility that now we might make something of real value out of this alchemic connection. Because it is our 7th Meeting, here, I also believe that we have reached a level of maturity that has resulted from these meetings and I have great expectations for what this 7th Meeting will produce. I would also like to join Constantin in the thanks he has offered to the City of Hania and to the Centre for Mediterranean Architecture, as well as to the Socrates Thematic Network for the support we have especially received over the last three years. This has made it possible and you are the people who will take it forward. I wish you and us a very successful meeting for now and into the future.

Prof. Yannis A. Phillis

Rector of the Technical University of Crete

Honorable Vice-Mayor,
Ladies and Gentlemen,

Good evening! As you have probably noticed from my attire, I am not an architect, as I am wearing a tie. I also don't know anything about chemistry and alchemy, so that is a second feature of mine. Architecture, though, is the essence of it all: we have architecture of buildings, architecture of landscape, architecture of computers and machines and

even the architecture of logic. In fact, my latest paper was on inference, engine architecture, if that means anything to you. We have architecture in politics, when referring to a politician as the architect behind a certain code or legislation. We have architecture in the Olympics, as is the case when referring to the architect behind the successful Olympics to be so and so. Therefore I would say that you are fortunate to belong to a discipline that fuses together science, metaphor, imagery and above all art, and it is for this reason that I feel a tinge of jealousy, although, I remember once telling an architect that I was glad I never became one.

Obviously, I was either consciously or subconsciously trying to defend my own scientific turf, with a little intrusion of "anthropia" (humanity or compassion) and a little disorder. But then, what would life be without a little humanity? It would be nothing! After all, we cannot go around marching like soldiers. We need some freedom and compassion. Then again, what would science be without humanity? Again, nothing! So, I decided that we needed a School of Architecture in our Technical University, not just the hard sciences, and we are finally opening just such a school. My colleagues and I have worked hard in this direction and, in October, we will be starting classes with all the hurdles, naturally, of Greek bureaucracy and ministry, but that is another matter. We think that this School must put a lot of emphasis on connecting the University with the local society. It should be well-grounded in Greek and European tradition, with a view to the future.

Naturally, being among architects, I have no choice but to speak metaphorically! This city has tremendous potential in architecture and it is a city blessed with many architects, some of whom are extremely good. So, this is a school befitting the local reality, which I am very pleased about. The curriculum of the new School will be oriented towards restoration of buildings and monuments with directives respecting the environment, be it natural or man-made. Moreover, like all schools, it will have its own dynamics according to the people it draws, as you are all aware. At any rate, I am very glad to be here and besides the usual things we normally do at conferences, I do wish you will allow some time to enjoy the city, the beaches, which we have plenty of, and the local "tavernas" (restaurants). May you all have a pleasant stay and enjoy the Meeting!

Zoe Karamanou

Head of the School of Architecture, Aristotle University of Thessaloniki

Dear Colleagues and Friends,

As we have already heard from the Vice-Mayor and the Rector of the University of Crete, this annual event for the 7th consecutive year, our Meeting in Hania around the first weekend of September, has now become an "institution", not strictly for ourselves and for our School, but for Hania, its municipality, its University and especially the Centre for Mediterranean Architecture. As Constantinou has already declared, the School of Architecture of the Aristotle University of Thessaloniki has under its auspices and supports this organization because we were persuaded of its success and cause since the onset. Representing our School of Architecture, I welcome you all, especially our dear guests, Kas and Stanford, for your and their participation and, although I have no doubts about

the success of this Meeting, I extend my best wishes and I am certain that our sessions will attempt to direct our discussions and suggestions toward a constructive and creative conclusion. Good luck!

Antonis Piperidakis

President of the Technical Chamber of Greece and branch of Western Crete

Dear Vice-Mayor of the City of Hania and President of the Center for Mediterranean Architecture,

Dear Rector of the Technical University of Crete,

Dear Colleagues,

Ladies and Gentlemen,

On behalf of the Council of the Technical Chamber of Greece and its Western Cretan Branch and its President, Mr. Yannis Alavanos, as well as on behalf of the Technical University of Crete, I would like to welcome you to the 7th Meeting of Heads of European Schools of Architecture. I would also like to welcome, whole-heartedly, the participants of this Meeting to our city, which we are very proud of. It is indeed a fitting occasion that Hania host this event because of its monuments, its rich architectural tradition and its Centre for Mediterranean Architecture which has a wide range of activities related to architecture in the area. The function of the CMA has been one of seriously contributing to the production of quality architecture, the organization of architectural events and activities, as well as making interventions that solidify and mobilize the community of local architects on the whole. Its existence has far greater significance and meaning when considering that its activities take place mainly in the Greek periphery, contradicting the widely-held belief that the major centers merit the attention of being sole producers. We are also very happy and proud to now have a School of Architecture in this city at the Technical University of Crete, and it is a pleasant coincidence that the opening of the school coincides with this Meeting. We believe that this Meeting will have a strong contribution to the newly-found School of Architecture as it will surely bring the School face to face with the environment actually existing in the European Union, which will in turn contribute to the School forming a significant cultural pole in the area, whose impact will be to ameliorate the aesthetic dimension of the city's architecture and better quality architectural services offered by the local architects. Consequently, the Technical Chamber of Greece could not stay away from this event organized by the Mediterranean Center of Architecture and the European Association for Architectural Education under the auspices of the Aristotle University of Thessaloniki and the European Union. Moreover, this Meeting has as main theme and focal point the structure of the curriculum of architectural studies, which is, of course, one of the more significant aspects of higher architectural education. Therefore, we consider very significant this effort to coordinate and create a spirit of collaboration between schools of architecture in order to take steps toward developing a new curriculum. Of course, this effort should take place in a way that will protect local cultures and identities and the richness of European cultures and architectural practices.

The work that you have already done in the framework of these meetings and, more specifically, in the Hania Statement that you produced in the framework of this event is a kind of guarantee that architectural education will be protected from the negative influences derived from the interests and profits of the marketplace, which consequently threatens the autonomy of education and the qualitative academic aspect of architectural education. Bearing all these thoughts in mind, I would like once more to welcome you and wish you a fruitful collaboration in the framework of this event.

Keynote Speech by

Professor Kas Oosterhuis

Technical University of Delft, Faculty of Architecture, Delft,
The Netherlands

Presentation of the Honorary Guest by Constantin Spiridonidis

Good afternoon to all of you, dear colleagues. For those who understand the development of architecture in terms of changing paradigms – that is to say, changing conceptions of architecture, conceptions of form, changing considerations about the architect and conceptions about the world – the contemporary paradigm has in its centre Kas Oosterhuis. We are very honored to have Kas and Ilona with us today. They both work in Holland, but not exclusively, and their production is diffused and spread all over the world. It is very interesting to see that most of our students – at least in my school, and I am sure that this is not exceptional – know their work very well and are inspired by it, and that this inspiration is always obvious, evident and present in their proposals and their work. I thought that it might be difficult to make an even short presentation of their rich work or even read highlights from it, and that it would be better for you to have it in front of you on the screen during this short introduction. So I would now like to invite Kas to step forward and give his lecture on "Protospace". Thank you very much.

A New Kind of Building

Professor Kas OOSTERHUIS

Technical University of Delft, Faculty of Architecture, Delft, The Netherlands

Mass-customization

Traditional vernacular building is accomplished by executing the process. There are no intermediate phases like a set of drawings, working drawings, drawings of details. The communication is direct from person to person. In modern computing lingo: through a peer-to-peer wireless sensor network. Peer-to-peer since people connect directly to their own kind, wireless since they are not physically connected, sensor network since they immediately absorb, process and propagate information. People put their minds together, discuss and take action. Exact measurements and other relevant numeric details are decided along the process of building. The end result is unpredictable in detail, but is performed according to an agreed set of simple rules.

Now, at the beginning of the 21st century, machines have taken the place of humans in the production and actual execution of the building elements. And now, based on digital techniques, we are able to establish a very similar peer-to-peer network of machines communicating with each other to produce an endless variety of different building elements, visually rich and complex, but still based on a set of simple rules. Humans connect to the machine-to-machine communication through conceptual interventions and through a variety of input devices. This process is called mass-customization, based on file to factory [F2F] production methods. Now everything is different in absolute size and position, not because of human non-accuracy, but thanks to computational processing of diversity.

Building, as the public knows, is based on the industrial mass-production of building components. The elements are produced as generic material which will be customized later in another phase of the life of the product. The semi-products are produced in a limited range of sizes and measurements, then stored and catalogued, waiting to be taken up by the next party, eventually ending up in an assembly in the factory or on-site as part of a building. The mass-produced elements are categorized and have specialized into discrete classes: doors, beams, windows, columns, tiles, bricks, hinges, wire, piping, etc. Production according to the principle of mass-customization follows a completely different path. There is no catalogue; the products are produced starting from raw material [which in most cases is still mass-produced] for a specific purpose, to become a unique part in a unique setting in a specific building. That mass-produced part would not fit anywhere else: it is truly unique.

Architecture based on this new paradigm of mass-customization will be essentially different from the art of designing buildings than we have seen until now. Completely new tools for creating diversity and complexity are being developed now to produce visual and constructive richness and diversity, yet based on simple rules being applied on conceptual procedures to generate behavioral relations between all constituting building elements.

The driving forces to organize the behavior of the control points of the geometry come from both external and internal forces communicating with the evolution of the 3D model.

Looking at the worlds from within the paradigm of mass-customization [MC], we see that it includes all possible products along the production lines of mass-production [MP]. By setting all parameters to the same value we can easily step one level down from MC to MP. The other way round is impossible. MC does include MP, while MP definitely does not include MC. Think of the inhabitants of Flatland, they are not able to experience - let alone conceive - Space. But Space inhabitants do have a notion of Flatland, as a section sliced out of Space.

A true understanding of the peer-to-peer network of machines communicating to machines connected by a flow of information leads to a completely new awareness of the architect / designer. We must go up one level, and start designing the rules for the behavior of all possible control points and the constraints of their behavior, instead of thinking of the rich and complex as exceptions to a given standard. The swarm of control points will be referred to as the Point Cloud in the context of this paper. All possible positions of the control points are no longer seen as exceptional states but as implicit possible states in the flocking relations between the points. The Point Cloud may be seen as a sort of Quantum State of geometry. There are no exceptions to a given standard; non-standard computation rules the control points: the exception has become the rule. Stepping up one level can be understood as stepping out of a world of plans and sections into a truly 3-dimensional space. Now we step out of mass-production and repetition into the realm of mass-customization and complexity, made possible by computational programming. We will step up one level and look at the world from there. As we will see later, I will propose to step up another level to enter the world of swarming behavioral space, leaving frozen 3D space like an experienced time-traveller would, or leaving Flatland like an inhabitant of Space.

Programming the Point Cloud

The recent ONL [Oosterhuis_Lenard] projects like the WEB of North-Holland, the Acoustic Barrier and the Cockpit building are based on the new building paradigm of mass-customization and the new design paradigm of programming soft design machines. Simple rules put into the machines are designed as to create a visually complex geometry. Through a peer-to-peer communication the data are transferred from the 3D model to the executing machines. Cutting, bending, drilling, welding machines are operated by numbers and sequences, which are produced by scripts, routines and procedures written by ONL and executed on the points of the Point Cloud. ONL organises the points of the Point Cloud through a variety of design strategies, using a variety of programming tools. Each project has followed a slightly different path, but shares the principle of programming the Point Cloud.

To fully understand the nature of the Point Cloud I must place it in the context of recent developments outside of the working field of architecture. There are three concepts I want to discuss here, all of them having to do with what you see when you are looking at the world from the level of complexity. Smart Dust, Utility Fog and Flocking Behavior.

After that I want to dive deeper into the New Kind of Science as proposed by Stephen Wolfram, and draw conclusions of the implications it has for the architectural programming of the Point Cloud. After that, I want to take you up one more level, and discuss the Real Time Behavior of the recent ONL projects Trans-Ports, Handdrawspace and the MUSCLE. The behavior of the control points has in these projects become a running process, which keeps running when it has been built. These constructs keep reconfiguring themselves, and produce complexity and unpredictability in real time. These projects are executables.

Building Relations between the Nodes

The concepts of Smart Dust, Utility Fog and Flocks are basically all based on the concept of building local relations. One node looks at the neighbouring node, but has no awareness of the whole Swarm of nodes. Intelligence is not something which can be programmed from the top down in a manner of reverse engineering, but is an awareness that emerges from the bottom up through a process of evolution by building relations between the nodes of the system. Intelligence is not necessarily aware of itself as being intelligent. Intelligence can very well emerge from swarming relatively stupid components. Together they perform as something complex, which humans may interpret as intelligent. Intelligence as I use it here is not seen as human intelligence. It is regarded as emergent behavior coming up from the complex interactions between less complex actuators. It seems to be possible to apply the same definition of intelligence to the functioning of our brains, traffic systems, people gathering, and to the growth and the shrinking of cities. And as I wish to discuss here, also to the relations that are built [both in the design process and in the actual operation of the construct] between all actuators / components assembled into a building.

Building relations in the concept of Smart Dust¹ [Fig 1] is done through a peer-to-peer wireless sensor network. The concept of Smart Dust is developed by Kristofer Pister at Berkeley University and working prototypes are put together. Each micro-electromechanical mote sends and receives signals from and to other micro-sensors. They have a sensor in their backpack, all of it not bigger than a grain of sand. The sensor is designed to pick up signals, smells, chemical substances, molecules according to the purpose of the Smart Dust particle. There is no PCU governing the swarm of Smart Dust particles. They basically sense, send and receive, propagating data and information like a rumour propagates through people in society. In the end people are also sensors, senders and receivers. It

¹ Smart Dust:

B.A. Warneke, K.S.J. Pister, "An Ultra-Low Energy Microcontroller for Smart Dust Wireless Sensor Networks," Int'l Solid-State Circuits Conf. 2004, (ISSCC 2004), San Francisco, Feb. 16-18, 2004.

"The goal of the Smart Dust project is to build a self-contained, millimeter-scale sensing and communication platform for a massively distributed sensor network. This device will be around the size of a grain of sand and will contain sensors, computational ability, bi-directional wireless communications, and a power supply, while being inexpensive enough to deploy by the hundreds. The science and engineering goal of the project is to build a complete, complex system in a tiny volume using state-of-the art technologies (as opposed to futuristic technologies), which will require evolutionary and revolutionary advances in integration, miniaturization, and energy management."

Website: <http://robotics.eecs.berkeley.edu/pister/SmartDust/>

is my hunch that - after having taken the step to see the world from one or two levels up - that we must start designing from the awareness that buildings and all constituting building elements are sensors, senders and receivers in the end, locally communicating with other specimens of their own and other species. Smart Dust is an operational system, be it that production costs of one mote is still something like 100 \$ instead of the intended 1 \$ in order to make it commercially applicable.

Multifunctional Mote

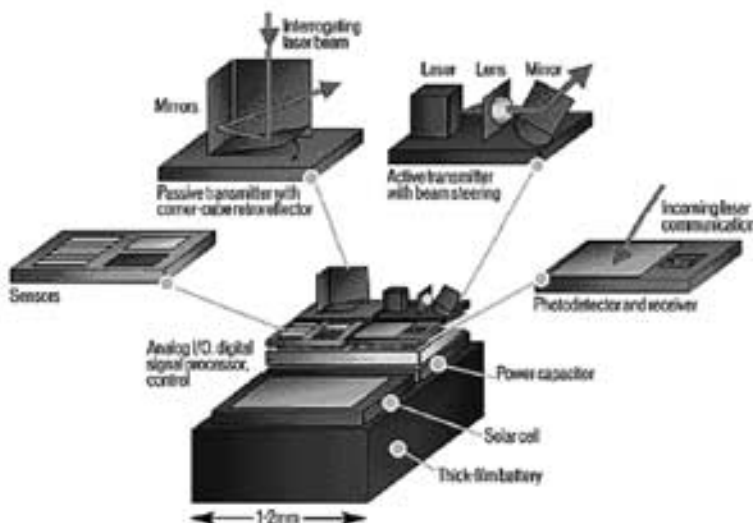


Fig 1: Smart Dust, Kristopher Pister et al 2004, Multifunctional Micro-Mote

The concept of Utility Fog² [Fig 2] by John Storrs Hall is based on the speculative assumption that we could build programmable molecules. If so, we could programme these Foglets to configure into any shape or substance we might desire. The description of the possibilities goes beyond any SciFi movie you have seen. Since the Utility Fog particles are not visible - you can even breathe them freely in and out - they can spontaneously appear and disappear. They can swap from visible and tangible to non-visible and ephemeral. Utility Fog builds the ultimate bridge between the gaseous and the solid state of stuff. It can

² Utility Fog:

Utility Fog: The Stuff that Dreams Are Made Of By J. Storrs Hall, Research Fellow of the Institute for Molecular Manufacturing.

"Imagine a microscopic robot. It has a body about the size of a human cell and 12 arms sticking out in all directions. A bucket-full of such robots might form a 'robot crystal' by linking their arms up into a lattice structure. Now take a room, with people, furniture, and other objects in it -- it's still mostly empty air. Fill the air completely full of robots. The robots are called Foglets and the substance they form is Utility Fog, which may have many useful medical applications. And when a number of utility foglets hold hands with their neighbors, they form a reconfigurable array of 'smart matter.'"

Website: www.imm.org

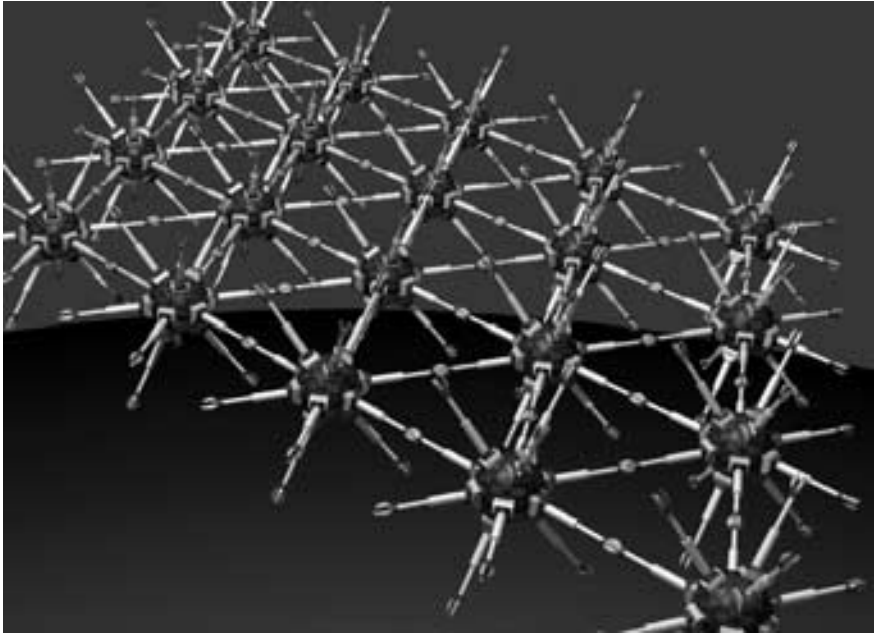


Fig 2: Utility Fog, John Storrs Hall, nano-scale Foglets shaking hands

transform itself from one state into another based on its programming. Utility Fog is seen by their author as an array of molecular robots looking at each other and eventually connecting to each other to form solid material. No one could predict what it would feel or look like, but in principle it should work. The question here is if we can learn from the concept of Utility Fog when thinking of complex structures for buildings. The way ONL has developed their latest projects shows that this is indeed the case. ONL basically regards each node as an intelligent point which is "peer-to-peer" looking to neighbouring points, and acting according to a simple set of programmed rules to form a complex consistent structure.

The constructive concept of points looking actively to each other immediately brings us to the concept of Flocks, Flocking Behavior and Boids³ [fig 3]. Boids as developed by Craig

³ Boids:

Reynolds, C. W. (1987) Flocks, Herds, and Schools: A Distributed Behavioral Model, in Computer Graphics, 21(4) (SIGGRAPH '87 Conference Proceedings) pages 25-34.

"The aggregate motion of a flock of birds, a herd of land animals, or a school of fish is a beautiful and familiar part of the natural world. But this type of complex motion is rarely seen in computer animation. This paper explores an approach based on simulation as an alternative to scripting the paths of each bird individually. The simulated flock is an elaboration of a particle system, with the simulated birds being the particles. The aggregate motion of the simulated flock is created by a distributed behavioral model much like that at work in a natural flock; the birds choose their own course. Each simulated bird is implemented as an independent actor that navigates according to its local perception of the dynamic environment, the laws of simulated physics that rule its motion, and a set of behaviors programmed into it by the "animator." The aggregate motion of the simulated flock is the result of the dense interaction of the relatively simple behaviors of the individual simulated birds."

Website: www.red3d.com/cwr/boids/

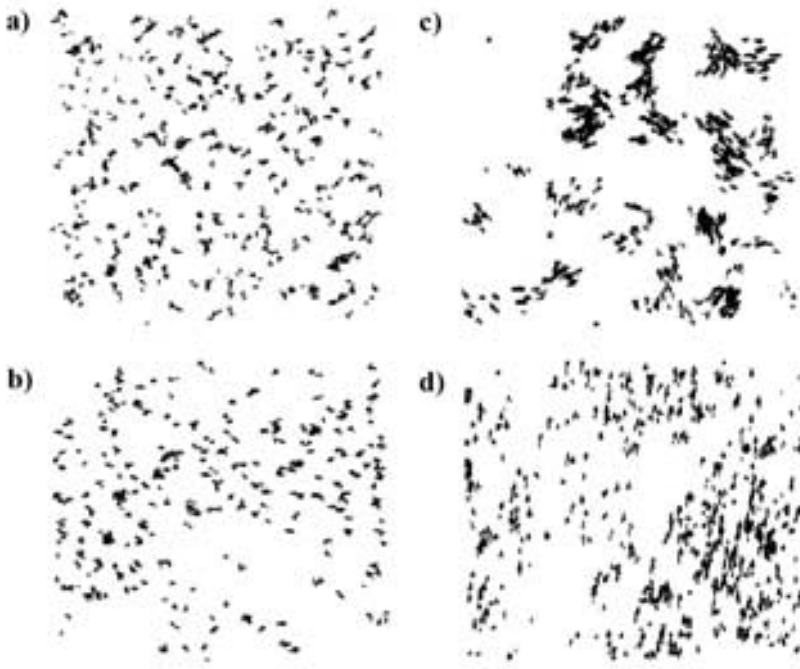


Fig 3: Boids, Craig Reynolds 1987, Flocking Behavior

Reynolds are active members of a flock calculating in real time their positions in relation to each other. Simple rules are underpinning their behavior. Each Boid computes a limited number of simple rules: Do not come too close to your neighbors, match your velocity with that of your neighbor, try to move towards the center of the mass of Boids. None of these rules says: form a flock. The rules are entirely local, referring to what a local Boid can see and perform in its immediate vicinity. And yet the flock forms, and is recognizable as a complex whole. The importance for the procedure of architectural design here is that one does not need to define the exact overall shape beforehand in order to group the individual members together into a consistent whole. Boids can be interpreted as the flocking nodes of a constructive mesh. The designer could work with simple rules starting from the related positions of the nodes to generate the relevant data for mass-customized production. Also the behavior of the nodes might be used to form the shape of the building. Placing a bouncing box around the flock to limit their room to move remains a valid possibility since each building has to take into account the presence of other objects in their urban context.

A New Kind of Building

Building on the existing machines called Cellular Automata, Stephen Wolfram⁴ [fig 4] recently declared his research in this field to form the foundations for a new kind of science, which he has also chosen as the title of his 1 kilo heavy book. Running a cellular automaton is building generation after [line after line] generation following some simple

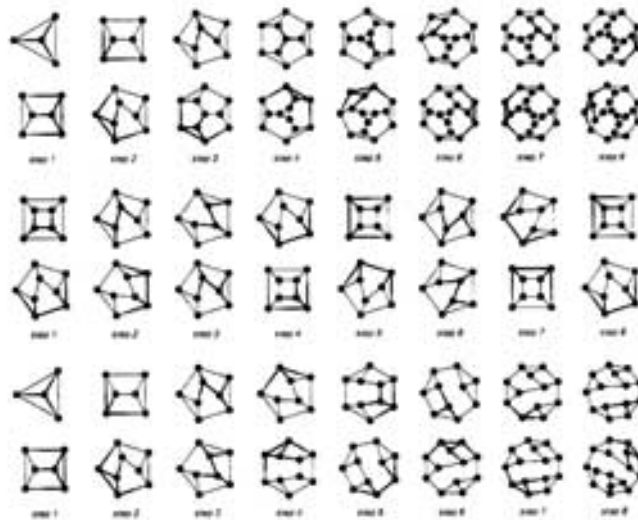


Fig 4A: A new kind of Science, Stephen Wolfram 2002, Substitution system, Simple rules generate complex results

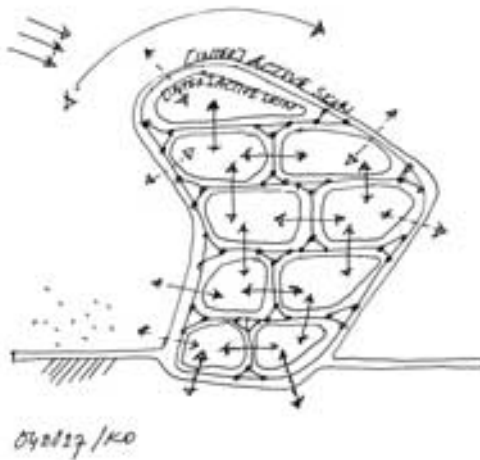


Fig 4B: TORS, ONL [Oosterhuis_Lénard] 1995-2004, Specialization of the detail

³ A New kind of Science, S. Wolfram, Wolfram Media, Inc., 2002, ISBN 1-57955-008-8

"But my discovery that many very simple programs produce great complexity immediately suggests a rather different explanation. For all it takes is that systems in nature operate like typical programs and then it follows that their behavior will often be complex. And the reason that such complexity is not usually seen in human artefacts is just that in building these we tend in effect to use programs that are specially chosen to give only behavior simple enough for us to be able to see that it will achieve the purposes we want."

Website: www.wolframscience.com/

rules. By performing years of runtime on thousands of possible rules, Wolfram found out that some rules lead to visually complex and unpredictable beings. Other rules tend to die out or would lead to uniform and predictable generations. And yet the rules leading to complexity are no more complicated than the other rules. Wolfram expects that these rules form the driving force behind all evolution, be it natural organisms or products induced by the interventions of humans, including scientific theories and mathematics. In theory everything that is complex and behaves unpredictable must be based on simple rules generating this complexity. If this is indeed the case then the development of cellular automata will outrun traditional science as the basis for further progress in all scientific fields, and which is relevant in the framework of this paper, it will turn out to cause a paradigm shift in the way buildings are conceived, the way geometry is generated and the methods by which the constituting parts are produced.

In essence, all points - comparable to the cells in a cellular automaton - are looking to its previous generation to decide what the next step will be, following some simple rules. Only by running the system one can find out to what class of result the simple rules will lead. Designing becomes running the computation, generation after generation, checking it, making changes, and running it again. Designing becomes to a much larger extent than it ever was an iterative process. In a traditional design process one iterates a limited number of times. When setting up a set of simple rules in a computation machine, one iterates in real time, that is many times per second. In turbo lingo this is designing with the speed of light, this is designing like a Formula 1 driver. Designing with rules, algorithms and with running the process builds the foundations for a new kind of building. These buildings are based on the behavior of an intelligent flock of swarming points, each of them executing a relatively simple rule, each of them acting according to local awareness of their immediate environment.

Specialization of the Building Detail

Local rules executed by the nodes do not only create their behavior, but also the complexity of their configurations. The nodes evolve through running substitution systems, following simple rules such as: substitute this node by 3 nodes with small distances between the 3 new nodes. This leads to a local specialisation of the node. Or in architectural terms: to the building detail. Building details need more points, and those new points may be generated by a script describing some simple rules executed on the nodes. In the case of the Acoustic Barrier⁵ [fig 5] each node of the Point Cloud has been multiplied to hundreds of new points in order to describe the geometry and to produce the data needed for the production of all thousands of unique elements. It may be obvious that some of the data received by the script come from the behavior of the points of the overall Point Cloud, and that other data used in the script come from the top-down styling interventions of the designer, from the characteristics of the applied materials, from structural calculations and from a variety of environmental constraints. Thus the complex swarm of flocking particles is evolving until a decision has been made to produce them.

Reading the Scientific American [SA] regularly as my favourite architecture magazine [I do not read traditional architectural magazines since it is my strong belief that you have

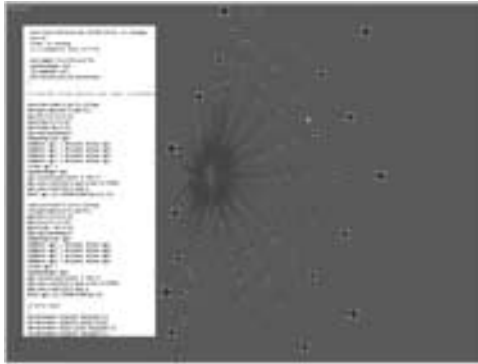


Fig 5A: Acoustic Barrier, ONL [Oosterhuis_Lénard] 2004, Point Cloud and generic script



Fig 5B: Acoustic Barrier, ONL [Oosterhuis_Lénard] 2004, File to Factory process of Mass-Customization generates 10.000 different nodes



Fig 5C: Acoustic Barrier, ONL [Oosterhuis_Lénard] 2004, Building site progress, 15 September 2004, the Cockpit will connect to the left end



Fig 5D: Cockpit Hessing ONL [Oosterhuis_Lénard] 2004, Specialization of group of points to form the Cockpit

⁵ Acoustic Barrier, architect ONL [Oosterhuis_Lénard], date of completion December 2004, client: Projectbureau Leidsche Rijn, product manufacturer: Meijers Staalbouw.

"The rules of the game. The brief is to combine the 1.5km long acoustic barrier with an industrial building of 5000m². The concept of the acoustic barrier including the Cockpit building is to design with the speed of passing traffic since the building is seen from the perspective of the driver. Cars, powerboats and planes are streamlined to diminish the drag. Along the A2 highway the Acoustic Barrier and the Cockpit do not move themselves, but they are placed in a continuous flow of cars passing by. The swarm of cars streams with a speed of 120 km/h along the acoustic barrier. The length of the built volume of the Cockpit emerging from the acoustic dike is a 10 times more than the height. The concept of the Cockpit building is inspired on a cockpit as integral part of the smooth body of a Starfighter. The Cockpit building functions as a 3d logo for the commercial area hidden behind the acoustic barrier" Website: www.oosterhuis.nl/quickstart/index.php?id=302

to experience the built reality architecture of your fellow architects in order to understand the essence of it, and read their theoretical texts] I stumbled upon an article on the specialisation of skin into hair⁶ [fig 6]. This seemed to resonate well with my attitude towards the specialisation of the node into the detail as ONL has developed and built the last few years.

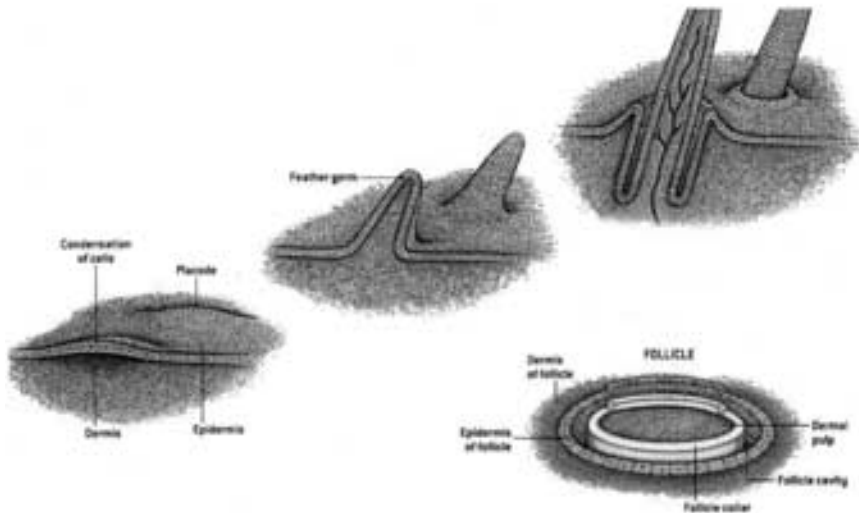


Fig 6: Specialization from skin into hair, Scientific American, March 2003

Hair and skin seem to be two completely different discrete elements, eventually assembled and cooperating as 2 separate families of elements, similar to embedding the headlights of a car in the car body. But where did the hair come from, when did it start to be a hair? The theory as described in SA speculates on the concept of the specialization of the skin into a folded rim. This folded rim proved to have qualities which remained in the process of evolution. Then in the deepest caves of the rim a new micro-climate arose, where certain cells would become harder but yet kept growing and evolved into something hard sticking out of the skin. It soon became clear that a hair had advantages for

⁶ Which Came First, the Feather or the Bird?, Richard O. Prum and Alan H. Brush, Scientific American, March 2003, pag 60-69.

"Hair, scales, fur, feathers. Of all the body coverings nature has designed, feathers are the most various and the most mysterious. How did these incredibly strong, wonderfully lightweight, amazingly intricate appendages evolve? Where did they come from? Only in the past six years have we begun to answer this question. Several lines of research have recently converged on a remarkable conclusion: the feather evolved in dinosaurs before the appearance of birds. The origin of feathers is a specific instance of the much more general question of the origin of evolutionary novelties - structures that have no clear antecedents in ancestral animals and no clear related structures (homologues) in contemporary relatives. Although evolutionary theory provides a robust explanation for the appearance of minor variations in the size and shape of creatures and their component parts, it does not yet give as much guidance for understanding the emergence of entirely new structures, including digits, limbs, eyes and feathers." Website: www.sciam.com [and type in the title in the search engine]

protecting the skin against environmental conditions, and on its evolutionary path skin folded into hair on many parts of the body.

Replace now the cells by the nodes of a construct, and replace hair by the building detail. This is exactly what happens during the evolution of the 3D model of ONL projects like the WEB, the Acoustic Barrier and the Cockpit. Just like hair covers the body in principle in most places, the specialised node in the form of the building detail is in principle present where it is useful. Basically in all places the specialization from node to detail is everywhere the same, but circumstantial differences in orientation create the variety of appearances of the specialised detail. Technically speaking the detail is fully parametric; its parameters change with the changes in orientation. The end result is that of a visually rich complexity. Not a single detail out of hundreds [WEB] or thousands [Acoustic Barrier] is the same. All are different, and that illustrates the way we look at the world from one level up.

The detail of the WEB⁷ [fig 7] is directly derived from the Point Cloud organised according to an icosahedron mesh mapped on the double curved NURBS surface. Just like needles stuck into a needle cushion, ONL generated normals perpendicular to the surface pointing inward. This action doubled the number of points and generated a new Point Cloud. The points are instructed to look at their immediate neighbor and construct flat planes between the double set of points. These planes are given a thickness, and that leads to another doubling of points. From there the bolted joints are developed, leading to another multiplication of the total number of points needed to describe the geometry and hence to send those data to the cutting machines. By receiving data from interventions by the designer, in the manner of cloning and adding points according to a simple local procedure, the detail evolves from the node.

Since the doubling of the nodes is not executed along parallel lines, the connecting planes are placed at an angle in relation to each other. This leads to an evolutionary constructive advantage since the fold increases the strength of the folded plates. It turns out that with this constructive parametric principle, ONL can virtually construct the support structure of any complex double curved surface, no matter if the curvature is round and smooth or sharply folded, no matter if the surface is convex or concave. The parametric detail of the WEB counts for a major invention in the construction technique for double curved surfaces. Moreover, it immediately connects the styling of the surface to the

⁷ Web of North-Holland, architect ONL [Oosterhuis Lénard], completed 2002, client Province of North-Holland, product manufacturer Meijers Staalbouw.

"One building one detail. The architecture of ONL has a history of minimizing the amount of different joints for constructive elements. Fifteen years ago this attitude led to minimalist buildings like the Zwolsche Algemeene and BRN Catering. At the beginning of the nineties Kas Oosterhuis realized that extreme minimalizing of the architectural language in the end will be a dead end street. Hence in the office a new approach towards detailing was developed: parametric design for the construction details and for the cladding details. Basically this means that there is one principal detail, and that detail appears in a multitude of different angles, dimensions and thicknesses. The parametric detail is scripted like a formula, while the parameters change from one position to the other. No detail has similar parameters, but they build upon the same formula. It is fair to say that the WEB is one building with one detail. This detail is designed to suit all different faces of the building. Roof, floor and facade are treated the same. Front and back, left and right are treated equal. There is no behind, all sides are up front. In this sense parametrically based architecture displays a huge correspondence to the design of industrial objects. Parametric architecture shares a similar kind of integrity."

Website: www.oosterhuis.nl/quickstart/index.php?id=117

construction and the manufacturing of it. Architecture, construction and manufacturing are one, in much the same way as body, skin and hair are one.

The Point Cloud of the Acoustic Barrier is generated through a different procedure than was used for the WEB. A long-stretched NURBS surface on both sides of the barrier is bombarded with 10.000 parallel lines. The 20.000 intersection points form the nodes of the Point Cloud. Executed on the nodes a number of scripts are evolved to develop the detail, and to generate the data needed for the production of the 40.000 unique structural members and the 10.000 unique triangular glass plates. By no means could this have been performed by traditional drawing techniques or by traditional production methods.

The Point Cloud of the Cockpit is directly related to the Point Cloud of the Acoustic Barrier. The stretched volume of the barrier pumps up so as to give space to over 5000m² floor surface for the Rolls Royce garage and showroom. The points are controlled along supple curves, which in their turn are controlled by a single reference curve, built in parametric ProEngineer software. Inside ProE ONL has applied a "pattern" for the parametric detail using the points on a surface.

The architectural, structural and production concept of the Acoustic Barrier means another major innovation. ONL has proved in close cooperation with the steel manufacturer Meijers Staalbouw that within a regular budget, large complex structures can be built and managed without the interference of a general contractor. Thanks to the direct link between the well evolved 3D model and the manufacturing, thanks to connecting the design machines to the production machines through scripting based on simple rules, ONL has proved that a complex building can be developed as an intelligently engineered product.

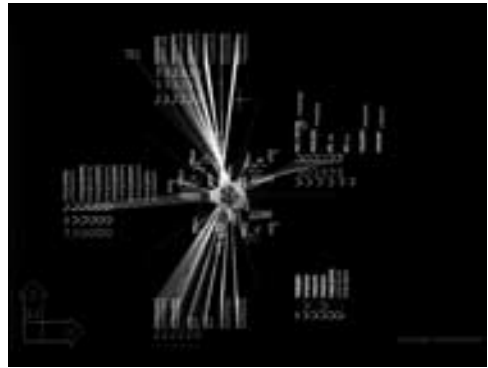


Fig 7A: Web of North-Holland, ONL [Oosterhuis_Lénard] 2002, Autoslip routine for F2F process

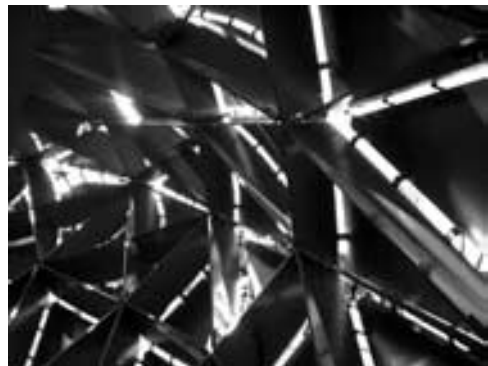


Fig 7B: Web of North-Holland, ONL [Oosterhuis_Lénard] 2002, Generic parametric detail



Fig 7C: Web of North-Holland, ONL [Oosterhuis_Lénard] 2002, Floriade World Flower Exhibition, Precision landing of spaceship

Nature and Products are Computations

Based on my experiences with building the WEB, the Acoustic Barrier and the Cockpit, I now strongly believe that all of nature, and all evolution of products are the result of a complex set of simple computations. Computations can be seen as building relations between nodes applying simple rules. The relation can vary from tracing a line [shortest connection] to exchanging data in real time [Smart Dust].

The making of architecture is setting up a set of computations. ONL has a definite preference for working with raw products like sheet metal. The WEB is completely made out of sheet metal, both steel for the construction and Hylite aluminium for the cladding panels. The TT Monument⁸ [fig 8] is made exclusively from very pure cast aluminium. The more ONL can penetrate the F2F process into raw material, the simpler the rules can be to generate the outcome of the design and manufacturing process. Then the outcome of the process can be based on simple rules generating visual complexity, which is highly appreciated by the public since it feels rich and communicates the feeling of freedom.



Fig 8: TT Monument, ONL [Oosterhuis_Lénard] 2002, Simple rules for generating the complex surface

⁸ TT Monument, artist ONL [Oosterhuis_Lénard], completed 2002, client TT Circuit Assen, product manufacturer Aluminiumgieterij Oldenzaal

"We wanted to fuse the motorbike and the driver. The speed of the bike blurs the boundaries between the constituting elements. Each part of the fusion is in transition to become the other. Each mechanical part is transforms to become the mental part. The wind reshapes the wheels, the human body fuses into the new men-machine body. The fusion creates a sensual landscape of hills and depressions, sharp rims and surprising torsions. The fused body performs a wheelie, celebrating the victory and pride like a horse. The TT Monument is the ultimate horse: strong and fast, agile and smooth, proud and stubborn." Website: <http://www.oosterhuis.nl/quickstart/index.php?id=169>

While everything we see around us in every room, in every car, on every street, in every city is based on simple computations creating complex behaviour, it is virtually impossible to trace back the rules. The only way to find out is to run the system, to design a system which is based on simple rules generating complexity. This awareness potentially turns designers into researchers. Designers must set up systems and run the systems in order to perform. Performative architecture brings the architect and the artist back in the genetic center from where everything we see around us is generated.

Buildings are Complex Adaptive Systems. This means that building relations between the nodes represent only one class of relations among many other possible and necessary relations. To evolve something as complex as a building involves many truly different actors. It is not just one system that runs in real time. It must be seen and designed as a complex set of many interrelated systems, all of them performing simple rules. In something as complex as a building, the nodes do not only communicate to other nodes, but even more to other product species. They will receive information from other systems as well, and include those data in the processing of the information, and in their behavior. In other words, a Boid is not moving in an empty world, a Cellular Automaton cannot live as an isolated machine, Smart Dust particles do have contact with other systems. All machines feed on information, and all machines produce information of some sort. All machines are a small player in a complex structure of many interacting machines. But the necessity remains that in order to see the world from the next level, designers must start from simple rules placed in a complex environment rather than starting from a superficially complex structure without a clear concept of how to generate the data needed for customized production.

In the end we must think of building and evolving networks relating all the different players in the dynamic process of the evolution of the 3d model. Each player in the process can be seen as having its own specific view on the data. The different constituting elements of the building have different views on the evolving 3D model. Each of them sends signals to the model which receives the signal, processes it and acts accordingly. From other disciplines the model would receive another class of signals leading to adjustment of the model for completely different reasons. In essence this awareness leads to a process of Collaborative Design and Engineering. All players in this process - people, materials, forces, algorithms, money and energy alike - are in their own way connected to the evolutionary 3D model. Each of them performing some simple set of rules, without complete awareness of what the other parties are doing or are capable of. They all contribute from their own systems to the complex set of related systems as a whole. In this sense, even a traditional building process behaves like a swarm. But now we can learn from the new kind of science that we must build design processes on swarming intelligent particles in the Point Cloud communicating with each other. As humans we must learn to relate to the dynamics of super-fast real time computational processes. We must build the computational tools for Collaborative Design and Engineering in order to meet the rich expectations created by looking at the world from one or two levels up.

Based on my work with the Hyperbody Research Group at the TU in Delft, which I will discuss later in this paper, I have started the Protospace Lab for Collaborative Design and Engineering. We are now entering our second operational year, Protospace 1.2. Next year we hope to continue with Protospace 2.0^o [fig 9] in the resurrected WEB which is intended to be placed right in front of the Faculty of Architecture.

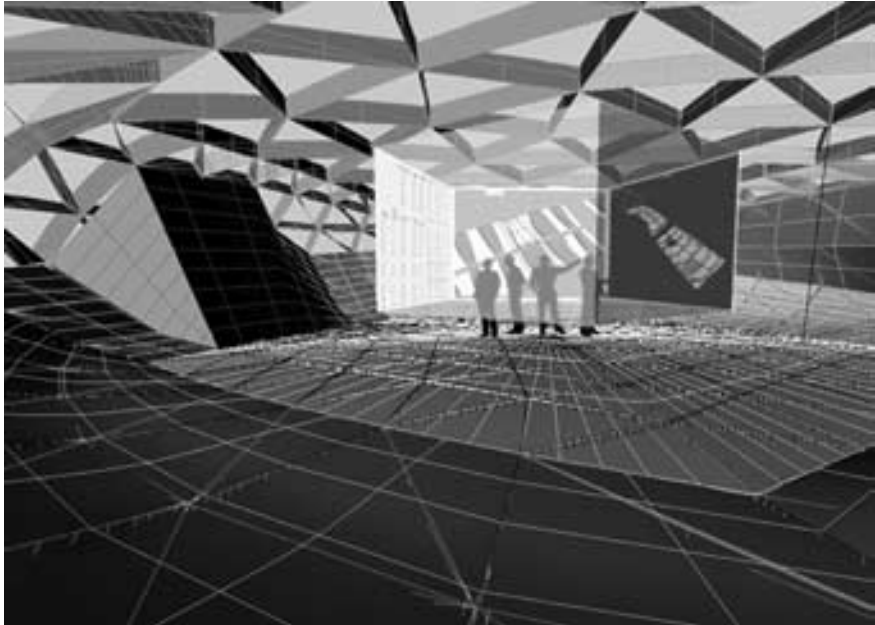


Fig 9: Protospace 2.0 in the WEB, ONL [Oosterhuis_Lénard] 2004, Delft University of Technology, Laboratory for Collaborative Design and Engineering [CD&E]

One of the issues we are dealing with is how to develop the design in collaboration with other disciplines [construction, ecology, economy] and with the client from the Point Cloud. The Point Cloud is the raw design material, comparable to the Foglets of the Utility Fog, comparable to the Smart Dust particles and comparable to Neumann's Cellular Automata. Starting from this universe of particles we can start building rules and watch the worlds develop.

From the Point Cloud to the Soap Bubble Construct

Wolfram's New Kind of Science includes studies of substitution systems for the evolution of networks. The building of networks is a very appropriate tool for organizing the points

⁹ Protospace is a Laboratory for Collaborative Design and Engineering in Real Time, directed by Prof Ir Kas Oosterhuis, at the Delft University of Technology.

"The transaction space for collaborative design is an augmented transaction space. Through sensors and actuators the senses of the designers are connected to the virtual prototype. The active view on the prototype is projected on a 360° panoramic screen. Active worlds are virtual environments running in real time. The active world is [re]calculating itself in real time. It exists. It represents a semi-autonomous identity developing a character. The active worlds are built according to a game structure. A game is a rule-based complex adaptive system that runs in real time. The rules of the game are subject to design. The collaborative design game is played by the players. Eventually the structure of the design game will co-evolve while playing the game."

Website: <http://130.161.126.123/index.php?id=5>

of the Point Cloud. The notion of the network can almost immediately be translated into the constructive system of a building. The rule starts as: replace the one point of the T-crossing with the 4 points of a tetrahedron. Make sure that the distance between the 4 new nodes are substantially smaller than the distance between the primary nodes of the constructive system. Repeat this process with slightly adapted rules to organize the number, the direction and the positions of the new generations of the node. In this way the new generations are nested in or patterned on the 3D array of primary nodes.

Repeating this procedure along the same substitution rule generates a 3D model resembling a soap bubble structure with smooth rounded transitions from floor to wall and from wall to roof. In fact the connection between floor and roof becomes completely equivalent to the connection between wall and roof, between wall and another wall. The complete structure of a multi-storey building can thus be developed from one universal Point Cloud of structural nodes, each of them specialized into the building detail via a limited number of simple rules.

Point Clouds Running in Real Time

For the Architecture Biennale, ONL created the Handdrawspace interactive painting¹⁰ [fig 10], one of the worlds running in the installation Trans-Ports. This work shows with what material ONL is redefining art and architecture. ONL uses game development software [Nemo then, Vrttools now] to run the system. Games are by definition running in real time, the game unfolds, the game is played by the rules. Game software is also capable of setting up multi-player worlds, which promise to be very appropriate for the process of Collaborative Design and Engineering.



Fig 10: Handdrawspace, Architecture Biennale Venice 2000, Interactive painting

¹⁰ Handdrawspace, artist ONL [Oosterhuis, Lénard], Architecture Biennale Venice in Italian Pavilion, 2000, interactive painting.

"Handdrawspace is based on 7 intuitive 3d sketches which continuously change position and shape. The trajectories of the sketches are restlessly emitting dynamic particles. The particles are appearing and disappearing in a smooth dialogue between the 3d Handdrawspace world and the visitors at the biennale installation Trans-Ports – When you step into the cave and go right to the centerpoint, a new colour for the background of the Handdrawspace world is launched. The inner circle of sensors triggers the geometries of the sketches to come closer, and thus to attract the particles. They become huge and fill the entire projection. Stepping into the outer ring of sensors the particles are driven away from you, and you experience the vastness of the space in which the particles are flocking."

Website: <http://www.oosterhuis.nl/quickstart/index.php?id=197>

In Handdrawspace particles are continuously emitted from invisible 3D sketches. The number of particles, the size of the particles, their position in the universe and the colours are input values set through infrared sensors by the visitors walking around in the central space of the installation. The people connect to the Point Cloud universe. The always changing values for the particles make sure that the same configuration will never be repeated. Each time one visits the Handdrawspace Universe one experiences a fresh unique world. The outcome of the real time computation is rich and complex, and never predictable in detail. The people walking around step by step learn how to cooperate with the running system: they teach themselves how to play by the rules [without changing them]. Some people watch the running environment as if it were an instant movie, others involve themselves actively and change the course of the universe.

Now extrapolate this concept to the realm of architecture. When we can involve the very movements of people in the running process of architecture itself, we are really changing the static foundations that architecture has been built upon. And when we can involve the changing circumstantial conditions of the weather and other contextual data into the running process of the building itself, we can start looking at the world from yet another level. Then we are at least two levels up from where we are now. Extrapolating Handdrawspace into architecture leads to a major paradigm shift in the collaborative evolution of the 3D model, and it leads in the same manner to a major paradigm shift in the way we connect to buildings as running processes.

Looking at the world from there means looking at the Point Cloud as a swarm of intelligent beings communicating with each other in real time and all the time, as long as it takes them to live their process. The installation Trans-Ports in self-explanatory mode¹¹ [fig 11]

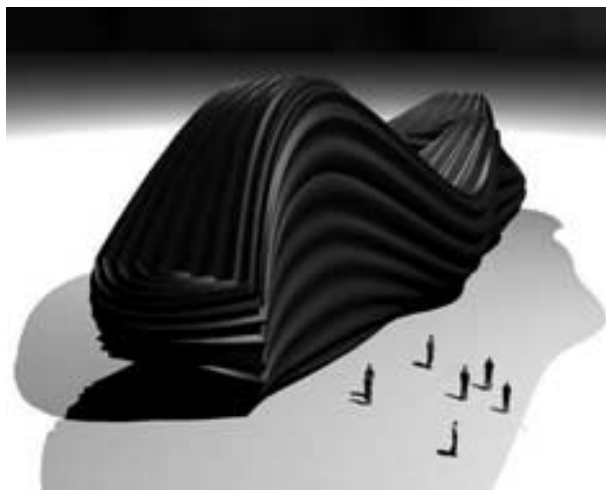


Fig 11: Trans-Ports, ONL [Oosterhuis_Lénard] 2000, Architecture Biennale 2000, Programmable architecture

¹¹ Trans-Ports, architect ONL [Oosterhuis_Lénard], Architecture Biennale Venice, 2000, interactive installation. "The active structure Trans-Ports digests fresh data in real time. It is nothing like the traditional static architecture which is calculated to resist the biggest possible forces. On the contrary, the Trans-Ports structure is a lean device which relaxes when external or internal forces are modest, and tightens when the forces are fierce. It acts like a muscle. In the Trans-Ports concept the data representing external forces come from the Internet and the physical visitors who produce the data which act as the parameters for changes in the physical shape of the active structures." Website: <http://www.oosterhuis.nl/quickstart/index.php?id=346>

gives us another clue to build the relations between the points themselves, between the people among themselves, and between the people and the points. People and points are two different Point Clouds interacting with each other. Trans-Ports self-explanatory mode introduces a third active Point Cloud in the form of the pixels mapped as information on the interior skin. These pixels can be seen as a Point Cloud which can be programmed to communicate many visual complexities ranging from letters and language through signs and images to movies and real time web-cams connected to other active environments.

Walking around in Trans-Ports changes values of the positions of the nodes in the construction. The nodes inter-connected by a building block called Cool Cloth bought by ONL via Internet from an Australian gamer. The algorithm of Cool Cloth organises their nodes in a 7x7 frequent mesh in such a way as to simulate the movements of a waving flag. ONL connected the active flag mesh to a shape which recalls that of the Saltwater pavilion, a pumped up tunnel body with open ends.

While the nodes of Trans-Ports communicate through Cool Cloth, the interaction with the users is built by ONL through an MIDI building block especially developed for Trans-Ports. Triggering the sensors is translated into MIDI numbers [between 0 and 128] which are inked to certain actions of the connected node-structure. ONL has programmed the actions in such a way that all actions can take place simultaneously, leading to complex behavior which never repeats itself.

Looking at the Trans-Ports machine in operation, one gets the feeling that it displays free will, a will of its own. Since the free will of people is in the end the result of a complex set of in itself simple rules being executed by the human brain in close cooperation with the human body, it seems perfectly OK to postulate that it is indeed a simple form of free will. It is unpredictable for the people who have scripted it, and unpredictable for the people playing with the running system. If they are not the ones predicting what Trans-Ports will do exactly, it can only be the running system called Trans-Ports itself that decides in real time. The Trans-Ports machine digests the randomness of the people navigating in the installation arena.

For ONL Trans-Ports has become an anchor point for Programmable Architecture. From then on ONL was ready to lift the conceptual designers' mind up to the next level, to the level of all possible interactions between all players in the game of building and architecture. Looking at the world from there no building can be seen as static: they all move, be it that most of them are extremely slow and extremely stupid. Since 2000 ONL has embarked on an architecture where all players [including all building materials] are seen as potential senders, processors and receivers of information, and where all players communicate with members of their own flock and with other flocks in real time.

MUSCLE at Non-Standard Architectures

Built especially for the NSA show in Paris for a budget of EUR 70.000,- ONL has applied the knowledge of the theoretical vehicle Trans-Ports into a working prototype called the MUSCLE¹² [fig 12]. The MUSCLE consists of 72 pneumatic muscles connected to each other forming a consistent mesh wrapped around a blue inflated bubble. In this prototype for



Fig 12 MUSCLE, ONL [Oosterhuis_Lénard] 2004, Non-Standard-Architectures, Centre Pompidou Paris, Interactive Installation with 72 actuators

a programmable structure it is not the nodes which are informed to move but the connecting muscles. Variable air pressure is sent in an endless stream of milliseconds pulses to each individual muscle. When air pressure is pumped into the muscles they become thicker and shorter [muscles are a product of FESTO]. When air pressure is let out of the muscles again they relax and regain their original maximum length. By varying the air pressure in real time [which in our physical world means: many times per second, and per se not absolutely continuous] for each individual muscle, the Point Cloud of nodes starts moving like the birds in a swarm.

The real time Virtools game as developed by ONL together with student-assistants of the HRG sends out signals to the I/O boards, which are connected to the 72 valves opening or closing the airlocks. The MUSCLE game graph will also receive input in real time from 24 sensors on 8 sensor boards attached to 8 nodes of the constructive muscular mesh. The public can touch the sensors [infrared sensors, touch sensors and proximity sensors] so as to interfere with the running system of the MUSCLE.

¹² MUSCLE, architect ONL [Oosterhuis_Lénard], interactive installation in Forum des Halles Centre Pompidou, Paris, 2004.

"For the exhibition Non-Standard Architecture ONL realizes a working prototype of the Trans-Ports project, called the MUSCLE. Programmable buildings can reconfigure themselves mentally and physically, probably without considering to completely displace themselves like the Walking City as proposed by Archigram in 1964. Programmable buildings change shape by contracting and relaxing industrial muscles. The MUSCLE is a pressurized soft volume wrapped in a mesh of tensile Festo muscles, which can change their own length. Orchestrated motions of the individual muscles change the length, the height, the width and thus the overall shape of the MUSCLE prototype by varying the pressure pumped into the 72 swarming muscles. The balanced pressure-tension combination bends and tapers in all directions."

Website: <http://www.oosterhuis.nl/quickstart/index.php?id=347>

The flock of muscles is programmed in such a way that all muscular actuators cooperate to perform a change. It is impossible for one muscle to change place without cooperating with the other connected muscles. Programmed by assembling the graphs in the Virtools software the nodes are set to look at each other when changing position. The change is communicated to the neighboring nodes. From there the desired length of the connecting muscles to accurately perform the displacement of the nodes is calculated. The calculation is based on experimental values found by testing the system with the chosen air pressure, the chosen sizes of the air pressure tubes, and the chosen capacity of the valves.

The nodes are looking to each other all the time. While the muscles are changing their lengths, the MUSCLE is hopping, twisting, bending and rotating constantly. As long as the program runs and the air pressure holds, it is alive. The MUSCLE is ONL's first materialized construct as a running system acting out of its own free will and at the same time interacting with the public. The process of interaction can only take place when there are at least two active parties involved, when there are at least two running systems communicating with each other. The MUSCLE is one running system, the human person another, both with a will of their own.

The MUSCLE is a "quick and dirty" built prototype for the New Kind of Building as introduced in the title of this paper. This new kind of building is not only designed through computation, it is a computation. The New Kind of Building never stops calculating the positions of its thousands of primary and its millions of secondary nodes, based on input values from both the users of the building and from environmental forces acting upon the structure. The New Kind of Building is a Hyperbody.

911 Hypercube

Asked by Max Protetch to contribute to the Ground Zero exhibition showing the architects response to the 911 event, ONL proposed a large fully programmable cubic volume, a Hypercube. ONL proposes here an Open Source Building approach, in contrast to the defensive Pavlov reaction the US took as their policy. Only by setting up an open political system based on mutual respect one can build a society which is not based on threat, hate or fear. To this open global society belongs an open global architecture: an architecture which is a running process and which feeds on streaming information from all sides of the globe. ONL came up with a 3D lattice structure where all structural members are data-driven programmable hydraulic cylinders. The pistons act as actuators for the data-driven building. If all pistons are at their extreme position, the building can shrink 50% of its size in all three axes. As a net result the building can shrink or expand to 8 times its original volume.

The 911 Hypercube Building¹³ [fig 13] responds to changes triggered by its users, and also proposes changes by itself according to a set of simple rules generating a complexity of possible configurations. The Hyperbody would also respond to changing weather conditions, to the behavior of people in the street, and to signals and patterns received from other buildings and other information processing vehicles from all over the world. The 911 Hypercube is designed to be a giant interface between many different behavioral



Fig 13A: 911 HYPERCUBE, ONL [Oosterhuis_Lénard] 2002, Max Protetch Gallery New York, Open Source architecture, March mode

swarms, ranging from people from any culture to other built structures, both ephemeral [programs, organizations, the Internet] and tangible [buildings, cars, microwaves, air conditioning, cell phones] information processing machines. The presentation of the 911 Hypercube comes in 12 modes, corresponding to the 12 months of the year, 12 exemplary types of weather and 12 typical NY events.

Peer-to-peer architecture means communicating between equivalent computing machines. Just like in Smart Dust we look at the nodes of the 911 Hypercube as small computing devices. Some form of intelligence has been built into the node. The nodes do at least perform some form of sensing, processing and propagating of signals. They send signals to the actuators, the hydraulic cylinders. Thus the construction of the 911 Hypercube is a peer-to-peer network. People can be peers, spaces can be peers, they all connect in similar peer-to-peer networks. A simple conversation between people establishes a peer-to-peer communication. It is actually this basic level of communication I am considering when thinking of programmable pro-active hyperbuildings.

¹³ 911 Hypercube, Ground Zero exhibition, Max Protetch Gallery, New York, 2002

"The war in Afghanistan took more lives than the attack on the WTC. Why do most people feel different about the death toll in Afghanistan than about the sudden death of the WTC and 3000 users? Are some killings more just than others? Are the winners always those who kill the most people? If you examine crime movies you will find out that the "good" ones are always licensed to kill many "bad" ones. Is that why the US had to kill more Afghans and Saudis than there were citizens killed on 911? Come on America, wake up and find a way to take revenge in a more intelligent way. Do not waste our precious time on the easy killing of poorly armed people. Let's face it. Everybody was fascinated by the 911 event. Everyone was thrilled to watch the movie, over and over again. Only extremely disciplined individuals could resist to watch. Quickly destroying things is naturally much more appealing than slowly synthesizing things. How can we as architects appeal to people's fascinations by building new stuff?"

Website: <http://www.oosterhuis.nl/quickstart/index.php?id=155>



Fig 13B: 911 HYPERCUBE, ONL [Oosterhuis_Lénard] 2002, Max Protetch Gallery New York, Open Source architecture, August configuration

Protospace 1.1 Demo

Now I have explained the nature of the New Kind of Building, and looking at the world from there I want to discuss how the different disciplines might work together in order to get there. At the DUT my HRG has built a first rough concept for the Protospace 1.1 Demo¹⁴. As in a complex set of peer-to-peer networks working inside Protospace the various disciplines want to communicate in their own way with their own kin. In a process of Collaborative Design and Engineering one wants to express oneself to the highest level of knowledge and intuition of one's discipline. One expert in a specific field does not want to limit him/herself to constraints set by other disciplines which are either "not obviously" or "obviously not" relevant to one's own discipline.

¹⁴ Protospace 1.1 Demo, directed by Prof Ir Kas Oosterhuis, built by the Hyperbody Research Group, Delft University of Technology, 2004.

"How do the stakeholders collaborate in real time? Imagine the following scene. The game leader opens a file, the active world. Each file has a specific set of rules how to propose changes in the file. However, there will be developed a detailed Protospace protocol how to play by the rules. The referee explains to the players how to play the game. Each stakeholder chooses a view on the file. One player may choose different roles at the same time. The players come in action according to the rules of the game when it is their turn to propose a change. When playing the role of a specific stakeholder only that particular view on the database is displayed. While delivering the input through sensors and numpads the players are free to walk and chat in the group design room. The group design room is an open design studio, a social transaction space. The other players watch the active player and respond immediately like in a normal conversation."

Website: <http://130.161.126.123/index.php?id=5>

The HRG has built a simple demo where the different players in the evolution of the 3D model each have their own view on the 3D model. For that I have chosen the role of the stylist, the construction engineer, the ecologist, the economist and the tourist; each of them actually sees the 3D model differently. The stylist sees a surface model which can be shaped, the construction engineer sees nodes and connecting members, the ecologist sees the surfaces separating different micro-climates, the economist sees numbers and spreadsheets, and the tourist navigates through the model as it will appear visually.

Each of the players sees something different but is still looking at the same thing. It is important that [s]he sees the essence of his/her own disciplines since that effectively shows the working space where [s]he is authorized to propose changes. Each discipline has another view on the same thing, just like every single person looks differently at the same scene. Ask two people to describe what they have seen, and you end up with two different stories. But still they were watching the same scene.

Similar to the birds in a flock, similar to the behavior of cars on the highway, similar to people in a meeting around the table, the experts in Protospace are looking to each other to adjust their positions in real time, and at the same time they are actively participating in the developing scene. In Protospace one is looking at the 3D model through his/her own pair of disciplinary eyes, while the other players may have a different look at things. The central theme of building tools for Collaborative Design and Engineering [CD&E] is to develop the 3D model by focussed disciplinary input, synchronous with the input of the other disciplines. The ultimate goal of Protospace is to improve the speed and quality of the design process based on parallel processing of the knowledge of all disciplines involved from the very first stages of the design.

The players will have immediate insight in the nature of the changes that the other party is putting through. And it is then up to the flock of players to decide whether these changes are improving or deteriorating the 3D model. To facilitate this, the HRG is working on intuitive validation systems to validate the changes that occur in the CD&E process. None of the disciplines takes the absolute lead. Just like in the peloton of bicyclists, the players lead alternately to go as fast forward as possible as a swarm as a whole. And to be perfectly honest, just like in a real tournament someone's contributions will turn out to be advantageous and respected, and this person will eventually connect his/her name to the project.

It is very well justified to compare the process of CD&E to a game which enfolds. The rules of the game are set from the beginning. The players play by the rules. Good players make an interesting game. Inexperienced players make a boring game. The questions which arise here are: who makes the rules? The architecture of any outcome of the game resides inside the rules. Simple strong rules create a higher form of complexity than shabby rules. Good architecture builds upon the strength of the set of rules. The true game of architecture in a CD&E setting creates situations where the rules are verified, tested and eventually improved. Only then can one speak of a true evolution of the 3D model - as opposed to enrolling and developing. The one who improves the project rules can be any player at any time in the process of CD&E.

Conclusion

Architecture has become a rule-based game, played by active members of a flock, communicating with other swarms. As proven above this is true for the F2F process of mass-customization, it is true for the New Kind of Building based on Real Time Behavior [RTB] of programmable pro-active structures, and it is true for the interactive process of CD&E. To be able to develop the F2F process of mass-customization one must step one level up and look at the world from there. Not looking from the top down, but from within into the new dimension of complexity. To be able to deal with the RTB of programmable constructs, one must step up another level and look at the world from the point of view that all nodes are executing their systems in real time and communicate in real time to their own kin and other species. And in order to be able to get there - two levels up - one needs to beam oneself up into the running process of CD&E and look at the world from within the process. The information architect works inside evolution.

To summarize the attitude of ONL in the design and production process of the New Kind of Building:

A One level up to Mass-Customization [MC]:

- MC does not mean a single repetitive component in the built structure
- MC includes traditional mass-produced [MP] building, while traditional building excludes MC

ONL achieves MC by:

- Developing the generic parametric detail
- Establishing the File to Factory [F2F] process

MC and F2F are based on:

- Point Cloud
- Scripts, routines and procedures to instruct the control points

B Two levels up to Real Time Behavior [RTB]:

- Constructs are developed as running processes
- The building reconfigures itself constantly
- RTB includes traditional static architecture, while traditional architecture excludes dynamic RTB

ONL achieves RTB by:

- Defining building components as actuators
- Feeding the actuators with data in real time
- Relating the actuators to the game program

RTB is based on:

- Swarm behavior
- Game Theory
- Collaborative Design and Engineering [CD&E]

Chapter 1

Policies and Initiatives towards the European Higher Education Area

This Session is divided into two parts; the first dealing with presentations coming from those that are responsible for the actions taken by the European Union towards European Higher Education, and the second part aims at presenting our own activities and the way in which our Thematic Network and our efforts are introduced, incorporated or merged with such initiatives.

Interventions of Session 1

Part I Panel

Ettore Deodato, Brussels, Belgium

Lupo Donà dalle Rose, Modena, Italy

Chair

Constantin Spiridonidis, Thessaloniki, Greece

Part II Panel

Herman Neuckermans, Leuven, Belgium

Constantin Spiridonidis, Thessaloniki, Greece

Maria Voyatzaki, Thessaloniki, Greece

Chair

James Horan, Dublin, Ireland

The Future Role of the Thematic Networks in the Context of the Bologna Process

Ettore DEODATO

Chair of the Department of Thematic Networks, Socrates Programme

As you will understand, in my job I have to travel a lot, because there are 38 thematic networks operating at this moment, which means 38 annual conferences. Of course, I don't attend all of them, but I do manage to go to at least 20-22 a year. However, I can say that I am very glad to be here, first of all, because this venue is fantastic, and also because this is the first time in my professional life that I am not required to wear a tie. That is very good, in that it reflects the family atmosphere of this event, and I think that one of the reasons for the success of the thematic networks is precisely that they are like a very big family. I will explain later how this family was born in 1996, and how many members it has at the moment.

My intervention – I am a very old-fashioned man who doesn't use power-point presentations: I would just like to give you an idea of our perspective from Brussels – will be in three parts.

One will be a general overview of the European Education Area today, and will outline which, in our opinion, are the most important challenges.

The second will be a very short intervention about the most recent conference of Education Ministers, the 2003 Berlin Conference (the next one, as you may know, will be held Bergen in 2005), and the three important priorities it set up. I will explain how these priorities are important for the thematic networks, and how the thematic networks fit perfectly into one of these priorities.

The third and last part will be about the family of thematic networks. I know that you have been working in thematic networks for four years now, but I am sure, as I have found at all the other conferences, that you know very little about the action of the Erasmus programme in thematic networks.

Thematic networks is just one of the actions of the Erasmus programme. You all know the Erasmus programme, I suppose, primarily because of the student mobility scheme, which is our flagship programme. You may also know that there was a movie about Erasmus and student mobility (its French title was *L'Auberge espagnole*), based on the premise that this programme is just a kind of marriage bureau because a lot of marriages result from it. Which has some truth to it and maybe it would be worth writing a book about it from this perspective. But if the first action in order of importance is Erasmus mobility, the second is thematic networks, and I will explain how this has been an extremely successful action since its inception in 1996.

But, first of all, let me say something about the general environment in which we see this new 'Europe of knowledge' as it is sometimes called, or more formally, the European Higher Education Area. In Brussels, we believe that the three most important challenges at the moment are the challenge of demographics, the challenge of new information and, which is the most important both for you, because you are working in a thematic network, and for us, the challenge of quality. I shall start by saying a few words about the first two challenges, which, from the perspective of thematic networks, are less important than the challenge of quality.

The demographic challenge is one that we are tackling with a lot of energy, because student numbers are not growing, except to some small degree in Eastern Europe, due to an influx of female students; and this is something new for us. But without these female students many universities, in our opinion, would have scaled down or even closed down some departments. So demographics is a major challenge, as is the question of how the university can tackle it. This is a new challenge, because the university must move from a situation in which the future was assured to one in which they have to work to ensure it and in which the public, in this case the students, will require more accountability from them and perhaps more influence on what they do and whom they serve. This demographic challenge also means that the university has to provide access differently from in the past; they have to provide access to non-traditional students or to students from a non-traditional academic background, a training background for instance; and they may have to provide teaching at unusual hours, such as in the evenings, on weekends, or in unusual places, at the workplace, at home, or via an unusual technique, like the Internet. These are not new for us and probably not for you, but for the majority of the universities this could mean a sort of Copernican revolution.

The second challenge posed by the actual environment of the European Higher Education Area is posed by the new information technologies. The computer and the Internet are more and more integrated into the life of universities, but we are not in as strong a position as the American universities, which have a lot of virtual campuses. The European Commission launched the idea of creating virtual campuses two years ago, but for the moment it is hard to see it being adopted by European universities. So we will have to work to reach the same standards as the USA, to create virtual campuses and to twin universities electronically. This is very important in terms of student mobility. As an official of the European Union working in the Erasmus unit I can tell you that although the Erasmus student mobility scheme has been a great success, you may be astonished to hear that it has moved only 5% of the European student population. 5%! That is nothing. Three years ago we celebrated the 1 million student mobility mark, and we would like to reach 2 million in 2007; but even when we reach the 2 million mark that will still be only around 5.5% of Europe's total student population. That means that we need to drastically improve the technologies, so we can bring Europe to the students as well as bringing students to Europe. So the importance of new technologies is very, very strong.

The third challenge for us in Brussels, which, in my opinion, is very important for the future life of the thematic networks and hence for your future cycle of three years, is the quality challenge. Quality in higher education is no longer a given. We think that the fact that a professor was appointed ten or fifteen years ago and has regularly published articles in scholarly journals is no longer enough. Not for the European Commission, of course, but, first of all, for students, parents and employers, because this kind of audience wants to know which institution delivers the best results in a given field of study. We can define

this as a sort of consumer protection. They want to know which institution really can deliver the best education in a specific field of study. Secondly, it is not enough for the Ministries and for private sponsors, because they want to know more precisely what they are financing; this is a problem of accountability. And, in Brussels, we think that it is not enough for the universities themselves, because a self-respecting university wants and needs to know about the quality of its own teaching. The thematic network will have a crucial role in this issue of quality assessment.

This challenge is important because in this framework we need two kinds of experience: one has to do with internal quality assurance, within the universities, and the other with external quality assurance, which could be achieved through external assessments. Concerning internal quality assurance – and I think it is obvious that thematic networks have a role to play here – the pilot scheme launched by the European Commission in 2002 using three different thematic networks was very important. Another experience of quality assurance came from ENQA, the biggest agency for the evaluation of quality, which is based in Denmark. This pilot experiment in external assessment involved four different thematic networks from the beginning, in 2002, and it became very clear that the thematic networks are the most appropriate fora for the effective evaluation of quality assurance. So this is very important, both for us and for you, for your future existence.

Let me say again, to underline the importance of the thematic networks in quality assurance, that the Berlin Conference established three interim priorities for the two-year period before the next Ministerial Conference in Bergen in 2005. (I know that yesterday there was an intervention about the Prague Conference, but Prague is now history as far as we are concerned.) These are: the recognition of degrees and of periods of studies, which is very important, of course; two-cycle systems, and you know the meaning of two-cycle systems better than I do; and quality assurance, which is a key-word for the future. You all know that the European Higher Education Area was defined by the conference in Lisbon in March 2000 as, and I quote the definition, "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". This was the definition from Lisbon.

To return to quality assurance, which was one of the main topics at the Berlin Conference, I quote one of the declarations made there with regard to quality assurance: "The quality of higher education has proven to be at the heart of the setting up of the European Higher Education Area. Ministers commit themselves to supporting further development of quality assurance at the institutional, national, and European level. They stress the need to develop mutually shared criteria and methodologies on quality assurance." In the phrase "mutually shared criteria" I think that you can hear something similar to the task of the thematic networks, or to the task of tuning. The mutual sharing of criteria means the prior definition, an X-ray of your field of competence. Because when you have the X-ray you can, of course, define the competences, you can define the criteria, and you can share with the other countries in the European Union the criteria in your field of education; and for this reason I have to stress again that the thematic network is one of the most important fora in which these criteria can be defined and shared.

Returning again to the word quality, another idea that came out of the Berlin Conference was to network the quality agencies; and this will also be very important for the Erasmus thematic networks, because in future they will be working very closely with these national agencies and with networks of agencies. So again, you can be proud to be in a thematic

network, because this kind of action will in the future become the most crucial in the European Education Area.

Now after these two sections of my speech, which have quality as the common term of reference, I would like to say a few words more about thematic networks. You have been here for three years, and you are one of the most important thematic networks among the 38 that constitute the family of thematic networks. You know that thematic networks is one the most important sections of the Erasmus programme. The thematic networks model has also been adopted by other programmes: I don't know if you have read about the Comenius programme, which deals with secondary schools, or the Grundtvig programme, which deals with adult education; both of these programmes had adopted a thematic network model like the Erasmus model. This is very important, because it enables us to have links with the Comenius programme, and so with secondary school education, and with the Grundtvig programme, which means adult education, and we can thus cover the whole span of life-long learning. So maybe in the future you will be asked to co-operate with secondary schools, in the sense of teacher training, and to co-operate with the Grundtvig programme, in the sense of adult education; the modus of this co-operation is something that we would have to decide on together. But I stress this point because we really believe that collaboration among these three programmes is extremely important.

The thematic networks started their life in 1996. In a way, thematic networks were a sort of legacy of another successful action launched by the European Commission in 1995, called 'evaluation conferences'. Some of you may have been at the Mantova Conference in 1996, which marked the end of these 'evaluation conferences'. At the time it was important, because it established a sort of state-of-the-art for architecture studies. This was perhaps easier, and less essential, for architecture than for some other fields of education, such as engineering. I remember very well the evaluation Conference in engineering studies, at which three or four different European definitions were used for the profession of the engineer. Right from the beginning they were faced with the difficulty of finding a common definition for the engineer in Europe, so the evaluation Conference was really a very important opportunity to achieve this.

In the beginning, the thematic networks were created on a vertical basis; that means that our idea in 1995-6 was to have thematic networks covering the vertical disciplines, in Europe: medicine, engineering, architecture, law, political science, and other faculties. But we discovered that there was also value in having transversal thematic networks: "humanitarian studies", for example, would cover economics, politics, the medical field and a lot of other fields. So we decided to create a number of transversal thematic networks as well, although most of the 38 thematic networks we have at the moment are vertical.

Initially, and up until 2000, the main activities of the thematic networks were those for which they are best known. Like mapping: the describing and analysing of existing teaching methods. Or defining: the defining of and experimenting with new teaching methods, which was one of the classic tasks of the thematic networks in the past. Or, for instance, producing or updating the translation and dissemination of the new teaching material, or other activities in the field of quality assurance. I think that you are all familiar with these kinds of activities; I am sure that your network has sub-networks working on these. The current situation sees an imbalance of scientific fields in comparison with the

humanistic fields; so our policy for the future will be to pay more attention to the thematic networks in the humanistic fields, because we would like to have a balance between the hard sciences and the humanities.

Two years ago, following the Bologna Process and the different environment that it created, and following also the Declarations of Lisbon and Madrid, we decided to introduce some modifications into the life of thematic networks. Of course I always say that, as in football, one of the golden rules is that a winning team must not be changed, so we didn't change the thematic networks. We did, however, make some modifications, because they were physiological evolutions of thematic networks.

I would like just to share with you these four new tasks for the thematic networks, one of which will be illustrated in a little while by Professor Lupo Donà dalle Rose. The first of the four tasks is the adoption of the methodology of tuning. Tuning is another pilot exercise of the European Union, so I will say only a few words about it, because, of course, Professor Lupo Donà dalle Rose is much more experienced than I am in this area. Briefly, tuning is another successful experiment that was launched by the European Commission three years ago, and its key words were mapping and sectorial competences. And, when you speak of sectorial competences, of course the link with the thematic networks is very tight. We would like all 38 of the thematic networks to adopt the tuning methodology in the next two or three years because, for the reason that I explained before, we need to have this overview, this general scenario of the definition of the competences, discipline by discipline.

The second novelty in the world of thematic networks is a closer link with research. I know that this is music to your ears because in the past, unfortunately, education and research – at least for the European Commission – were completely separate, and it was almost taboo to speak about research in education or about education and research. Now things are changing really very fast; and it may be that in the future the thematic networks will be financed both by the General Directorate for Education and by the General Directorate for Research. So please include some elements of research in your activities, more than in previous years.

The third new trend for thematic networks in the future has to do with the link between education and society. This, again, is a very important aspect, because we don't want to have thematic networks that are completely outside society. One of our rules when we set up the thematic networks was to have only academic partners; step by step, however, we changed our behavior, we changed our minds, and now we warmly recommend that the thematic networks include a really considerable number of non-academic partners. I understand that in certain fields this is easier than in others – it might be easier in architecture than in political science; but we would like to have thematic networks that are open to society, with the participation of local government, with the participation of foundations, with the participation of non-governmental associations, and all the galaxy of the non-academic world. This, too, is very important for the future, so please include some elements of civic society in your thematic network.

The fourth proposed novelty will be linked to the new programme that was launched last year by the European Commission; called Erasmus Mundus, it is, as everyone probably knows, a sort of Erasmus programme for the rest of the world. We would like to have a thematic network applying to the Erasmus Mundus programme, in order to have partners from outside the European Union. This will not be an outcome programme but an income

programme, which means that the basic philosophy of Erasmus Mundus will be to attract partners from outside Europe and to export the European model outside the European Union. So I always say jokingly that with the Erasmus Mundus programme you cannot go to New Zealand for a conference, but you can invite New Zealanders to your conference with Erasmus Mundus money. Jokes aside, I think that this is a very important fact for the future of European Education.

These, then, are the four novelties in thematic networks. Another innovation, which will come into effect this year (and is therefore important for your new application), is that henceforth the contract for thematic networks will cover three-year periods. This, as Constantin is well aware, in the past had to be done every year; but now we are merciful and we have decided to grant three-year contracts. This is important for the continuation of the thematic networks, and also because the funding will be more consistent and more substantial than in the past in order to accommodate these new activities.

So I think that I will stop here. What more can I say? I have known your thematic network from the beginning, and we are very glad to finance your thematic network and this wonderful conference every year here in Hania. I think that your thematic network has been involved in all the pilot projects that we have launched in the past. This is very important, because it means that your thematic network is very effective, very important, and we trust your association very much and your style of working together. So what can I say at the end of my speech? Just good luck for the future, we trust you, and we are counting on you for our new activities in the future. Thank you for your attention and have a good continuation. Unfortunately, I have to go back to Brussels tomorrow, so I feel a little bit guilty, but – without flattery – I feel that have experienced the flower of the architectural thematic network.

Thank you very much.

Discussion

Coordination by

Constantin Spiridonidis, Thessaloniki, Greece

Constantin Spiridonidis, Thessaloniki, Greece

Thank you, Ettore, for all the information you have provided. Are there any questions?

Joaquim Jose Braizinha, Lisbon, Portugal

Thank you for your speech, which I followed with a lot of attention. Regarding mobility, I would like to know what Brussels thinks about improving mobility because the most important problem for us in terms of mobility is the very low level of the fellowships and the fact that mobility has become a status for students of rich families as opposed to the original idea meant for those who did not have any alternatives. Normally, we open mobility that remains without candidatures from students whose families are not able to support them. This is very important since it is not enough to say that mobility should be improved, but what precisely is Brussels going to do about it. I have carefully studied the Network, Erasmus Mundus, because our Rector represents the branch in Portugal and can say that the level of financing is very low. In an effort to improve the Network, however, we always end up with the same problem – financing! For this reason, I would like to have more information about this.

Ettore Deodato, Brussels, Belgium

When referring to financing the scholarships, I suppose you mean those of students because there are also those regarding *staff* mobility. Maybe you know the "geometry" (pyramid / hierarchy) of institutions in Europe. The Commission administers money which is granted by the Council, which means that it is the Member States that decide the sum given for education, not the Commission. This implies that we are always trying to get more funds for education from the Member States and this is quite a struggle since, as you know from your own national situations, education is not considered a priority by the Member States, unfortunately, and this is a big mistake. With the money we receive from the Member States, we have two possibilities: either to improve and increase the grants, but, in this case, we reduce the number of students going abroad, or we increase the number of students going abroad by giving smaller grants. Over the last 4 or 5 years there has been a phenomenon of more and more complementary grants given by local institutions for Erasmus students. Germany is one of the countries receiving a lot of local support for Erasmus programs. We are fighting now on two fronts, one being to urge the member states and convince them that education is a very important priority in order to ensure support for education and the other is to motivate local governments to encourage Erasmus programs with complementary measures and funding for students. I agree with you that the grants are not enough however we are working on this problem.

Herman Neuckermans, Leuven, Belgium

Does Erasmus Mundus override Tempus or include it? Probably, you know that this venue originated from a platform that was the European Association for Architectural Education, which will commemorate its 30th anniversary next year, and it is from this platform that this new initiative grew out of. That platform includes people from non-European countries such as the former Soviet Union, etc., so, how can they be involved in this kind of process of quality enhancement? Will it be through Erasmus Mundus alone?

Ettore Deodato, Brussels, Belgium

No, not quite. I have a great deal of experience, having worked at Tempus for 7 years, I know the program very well and, frankly speaking, I do not want to see Tempus disappear because it is one of the most successful programs we had at the time in the European Union. So, Tempus will cover the countries outside the European Union and Erasmus Mundus will cover countries outside Europe, so that Russia will always be covered by Tempus in the future and work within it. Also, it is possible that Tempus will have more money starting next year.

Alexander Kudriavtsev, Moscow, Russia

For us, the "Bologna Process", as we call it, is very interesting because the Russian government also signed the Declaration. We have another system of grades, but we are widely rising in these two steps grade. However, when thinking about mobility, which is one of the keystones of the Bologna Process, I think in terms of quality, but this quality can be of a plus or minus and some students will look for this simplification in getting grades. For example, although I am not sure, I have heard that private schools in Hungary can grant the B.A. after 3 years in spite of the 3 plus 2 which is the ideal requirement under the terms of the Bologna Process for architecture. So, it seems that standards are different all over the world and in the Charter of the UIA and UNESCO on architectural education it states that the diversity of architectural education, forms and programs is a cultural richness or a world resource. Some students would like to have the simplification of grades, others look for what they cannot have in their net or local school, for example, some exotic area or new knowledge. So, another system of obtaining education presupposes alternative terms as well. We have 6 years (4 plus 2) or even the 7 years (4 plus 3), including the 5 years Bachelor's in the United States. Therefore, my question calls for standardizing these terms for the sake of having a more uniform system worldwide, so that, metaphorically speaking, at whatever point we happen to be in the world, we can switch on the electricity and be able to receive the same "power" or amount of education as in Australia, Russia, the United States, Chile, etc. In our country it is understood that it is important to have the first 3 grades and secondly the 2, which in essence means the Bologna Process.

Ettore Deodato, Brussels, Belgium

I agree with you completely and, briefly, the Bologna Process was quite a Copernican revolution because it changed, in certain countries, the dimension, perception and philosophy with respect to the model of the different cycle, which in other countries had been adopted for a long time. Mobility is very important and this is evident from the

results seen in the Erasmus Programs, to a certain extent. The input of a foreign student in the host university is highly beneficial and the knowledge and experience gained is equally valuable to the home university the student returns to. It is, basically, a two-way learning process, a double transfer of input, and if this effort is multiplied for a million students with many crossings, different mobility and, now, with new mobility within the new Member States, then this, in fact, is the meaning of Europe. I am sorry if I constantly refer to Erasmus, but Tempus also deserves mentioning since it has a good level of mobility as well. Nevertheless, I think that mobility must be improved and it is sad that the Member States are not really sensitive to this problem since they do not consider education a priority of the European Union.

As far as mobility is concerned, however, we need to make some modifications; for example, when considering Erasmus mobility on the whole, we see that one of the countries that receive the most students is Great Britain. The question is why? Surely, it is not so much because students prefer the British model, but they go there mainly to learn English. British education authorities are aware of the fact that many of the students they receive are not motivated by their level of teaching or methods, but rather by the opportunity for language learning. As a result, we are supporting more and more the teaching in other languages in other countries, which in this case refers to new Member States. For example, there are more and more Member States that teach Erasmus students in English or in French, understandably so, when considering that it is very difficult for a Greek student who goes to Finland to study in Finnish. The student would need at least 6 months to learn the local language before he / she could actually benefit from this opportunity. So, the point is that there are modifications to be made and adaptations are required in terms of students' Erasmus mobility and, just as the Thematic Networks are crucial for the future of education, so is the importance of student mobility.

Pierre Von Meiss, Lausanne, Switzerland

It is fair to say that, perhaps, with the introduction of the Bologna Process (3 plus 2), the whole Erasmus program has to be somewhat rethought because, in a way, mobility will install itself very well at the passage from the Bachelor's program into the Master's program – that is where they will choose a new university for the reason that it will be competent in exactly what they are looking for. Therefore, I think that in ten years' time mobility will have a very different picture not because of the Erasmus program, but because of the Bologna Process.

Tuning Educational Structures in Europe

A pilot project by and for higher education institutions supported by the European Commission in the framework of the Socrates programme

Julia GONZÁLEZ and Robert WAGENAAR

Joint project co-ordinators

The Bologna Declaration

The Bologna Declaration of June 1999 calls for the establishment by 2010 of a coherent, compatible and competitive European Higher Education Area, attractive for European students and for students and scholars from other continents. The European Education Ministers identified six action lines in Bologna and they have added three more in Prague in May 2001 and one more in Berlin in September 2003:

1. Adoption of a system of easily readable and comparable degrees
2. Adoption of a system essentially based on two cycles
3. Establishment of a system of credits
4. Promotion of mobility
5. Promotion of European co-operation in quality assurance
6. Promotion of the European dimension in higher education
7. Lifelong learning
8. Higher education institutions and students
9. Promoting the attractiveness of the European Higher Education Area
10. Doctoral level (third cycle).

The Bologna process addresses not only national governments, responsible for the education systems in their countries. The process also addresses the higher education sector, the individual universities, their associations and networks. Many universities have started preparing Bologna reforms in their institutions before being obliged to do so by their governments.

In fact, the European universities have declared at their Convention in Salamanca in March 2001 that: 'European higher education institutions recognise that their students need and demand qualifications which they can use effectively for the purpose of their studies and careers all over Europe. The institutions and their networks and organisations acknowledge their role and responsibility in this regard, and confirm their willingness to organise themselves accordingly within the framework of autonomy'. And furthermore: 'Higher education institutions endorse the move towards a compatible qualification framework based on the main articulation in undergraduate and postgraduate studies'.

The university Response Through Tuning

In the summer of 2000, a group of universities took up the Bologna challenge collectively and designed a pilot project called "Tuning educational structures in Europe". With the help of the European University Association EUA and the national Conferences of Rectors, the group of participants was widened. The European Commission was asked for a grant in the framework of the Socrates programme to support the project, which was granted in the winter of 2000-2001.

The Tuning project addresses several of the Bologna action lines and notably the adoption of a system of easily readable and comparable degrees, the adoption of a system based on two cycles and the establishment of a system of credits. The Tuning project contributes also to the realisation of the other Bologna action lines.

More specifically, the project aims at *identifying points of reference for generic and subject-specific competences* of first and second cycle graduates in a series of subject areas. At first instance in the fields of Business Administration, Chemistry, Education Sciences, Geology, History, Mathematics and Physics. Learning outcomes are described in terms of competences: what a learner knows or is able to demonstrate after the completion of a learning process. This concerns both subject specific competences and generic competences, like communication skills and leadership. University staff, students and employers have been consulted on the competences they expect from graduates.

Competences are described as points of reference for curriculum design and evaluation, not as straightjackets. They allow flexibility and autonomy in the construction of curricula. At the same time, they provide a *common language* for describing what curricula are aiming at.

Some 100 institutions participated in phase one of the project (2000-2002), representing the EU and EEA countries. The project is being co-ordinated by the University of Deusto, Spain and the University of Groningen, The Netherlands. Tuning builds on earlier experiences of co-operation in Socrates-Erasmus Thematic Networks and the ECTS pilot projects. It is expected that the results of Tuning will be of interest to higher education systems, institutions and programmes across Europe.

The name *Tuning* has been chosen for the project to reflect the idea that universities do not look for harmonisation of their degree programmes or any sort of unified, prescriptive or definitive European curricula, but simply for points of reference, convergence and common understanding. The protection of the rich diversity of European education has been paramount in the Tuning project from the very start and the project in no way seeks to restrict the independence of academic and subject specialists, or damage local and national academic authority.

The Tuning Methodology

In the framework of the Tuning project a methodology has been designed to understand curricula and to make them comparable. Five lines of approach have been chosen:

- 1) generic (general academic) competences,
- 2) subject-specific competences,
- 3) the role of ECTS as an accumulation system

- 4) approaches to learning, teaching, assessment and performance and
- 5) the role of quality enhancement in the educational process (based on a system of an internal institutional quality culture).

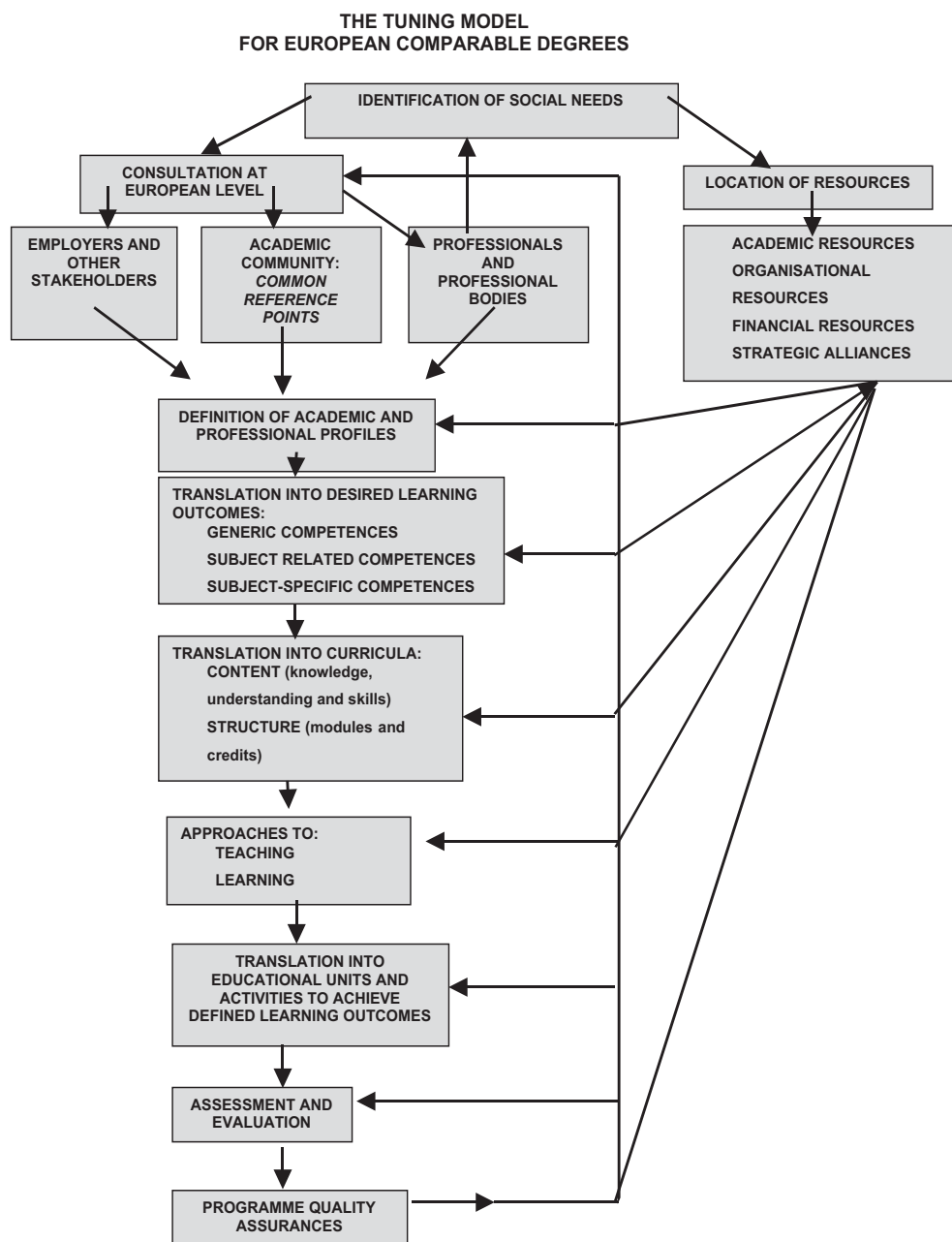
In the first phase of the Tuning project the emphasis was on the first three lines. The fourth and fifth lines received less attention due to time constraint, but they have a central place in the second phase of the project (2003-2004).

Each line has been developed according to a defined process. The starting point was updated information about the state of the art at European level. This information was then reflected upon and discussed by teams of experts in the seven subject related areas. It is the work in these teams validated by related European networks that provided understanding, context and conclusions which could be valid at European level. All together, the five lines of approach allow universities to *"tune"* their curricula without losing their autonomy and their capacity to innovate.

Furthermore Tuning has developed a model for designing, planning and implementing curricula offered within one institution, or, jointly, by two or more institutions. The main steps in the process for designing a study programme or an (international) integrated programme / joint degree is the following according to the Tuning model:

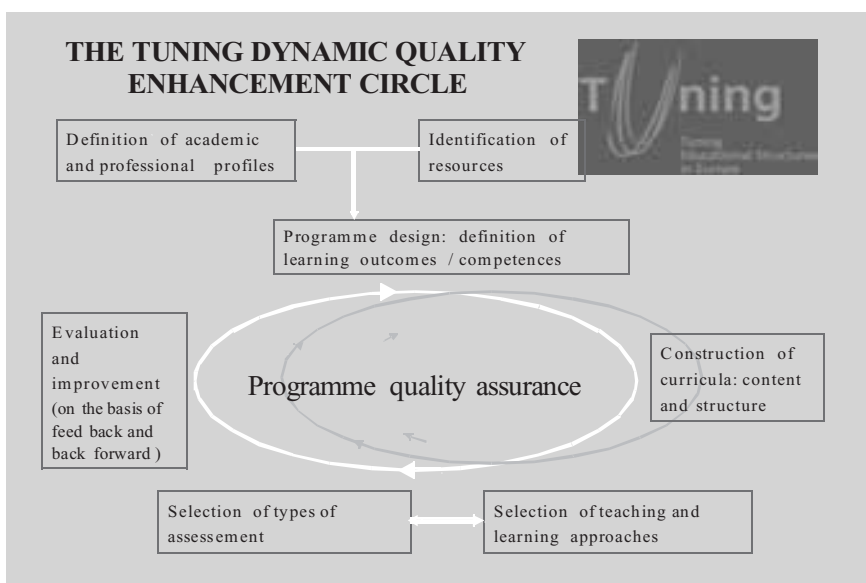
1. Meeting the basic conditions:
 - Is there commitment of the institution(s) concerned? In what terms: an (official) agreement or a strategic alliance?
 - Is there sufficient guarantee that the programme will be recognised legally?
 - Is there agreement with regard to the length of the programme to be designed in terms of ECTS-credits based on student workload?
 - Has the social need for a joint programme on a European level been identified? Has this been done on the basis of a consultation of stakeholders: employers, professionals and professional bodies?
 - Is the programme of sufficient interest from the academic point of view. Have common reference points been identified?
 - Are the necessary resources for the programme available inside or, if required, outside the partner institutions concerned.
2. Definition of academic and professional profiles.
3. Description of the objectives of the programme as well as the learning outcomes (in terms of knowledge, understanding and skills) that have to be met.
4. Identification of the generic and subject-related competencies which should be obtained in the programme.
5. Translation into the curriculum: content (topics to be covered) and structure (modules and credits)
6. Deciding the approaches to teaching and learning (types of methods, techniques and formats), as well as the methods of assessment (when required, the development of teaching material)
7. Translation into educational units and activities to achieve the defined learning outcomes.
8. Design of a programme of quality assurance.

This process is reflected in the following flow chart:



Tuning phase II

The second phase of the Tuning project (2003-2004) is based on the outcomes of the first phase (2000-2002). In its second phase the project will consolidate its findings together with a series of stakeholders (professional associations, employers, quality assurance agencies etc.), extend its scope to pre-accession and candidate countries, to other fields (inter-disciplinary and professionally oriented disciplines) and transfer its methodology to the Socrates-Erasmus Thematic Networks. Phase II of the project will give special attention to Tuning line 4: approaches to teaching, learning, assessment and performance in relation to line 5 Quality enhancement. Tuning sees quality as an integral part of each educational process as is reflected in the following:



A more general ambition of the Tuning project is to be a platform for the exchange of experience and knowledge between countries, higher education institutions and staff with regard to the implementation of the Bologna process at Europe-wide level. To facilitate further transparency in the educational structures and to further innovation, through communication of experience and identification of good practice, in order to produce convergence in higher education teaching in Europe.

For this, Tuning will act in a co-ordinated manner with all the actors involved in the process of tuning educational structures in Europe: universities and university staff, students (ESIB), European University Association (EUA), EURASHE, Quality Assurance and Accreditation Agencies (ENQA), the Bologna Follow-up Group, Ministries of Education, the European Commission, employers and Professional Associations.

Activities of phase II

Validation and consolidation

- Fine-tuning the results of lines 1 and 2 (identifying point of reference for generic competences and subject specific competences of first and second cycle graduates,

including level descriptors) in the subject areas Business, Chemistry, Education Sciences, Geology, History, Mathematics and Physics. These reference points for common curricula on the basis of agreed competences would enhance recognition and European integration of diplomas. They should be made operational for distance learning and lifelong learning as well.

- Validation of the results of lines 1 and 2 together with the main stakeholders: universities, employers, professional associations, students, quality assurance and accreditation agencies.
- Associate existing and future Socrates Erasmus Thematic Networks by inviting these to implement the Tuning methodology in their subject areas.

New Activities

- To fine-tune the general methodology for measuring workload developed as part of phase I of Tuning, to make this methodology operational and to test it at the level of subject areas.
- To establish a link between competences and ECTS credits and to test the use of the ECTS as a tool for curriculum design.
- To develop of the role of different approaches regarding teaching, learning, assessment and performance within the framework of curriculum design.
- To develop a useful approach for higher education institutions towards quality enhancement

New Partners, New Fields

- To open the Tuning process to more applied universities.
- To open the Tuning process to institutions in the pre-accession and candidate countries.
- To identify generic and subject-specific competences (skills, knowledge, content) in two new areas: Nursing (applied sciences) and European Studies (interdisciplinary studies) and, by doing so, to create two new European networks that can present examples of good practice, encouraging innovation and quality in the joint reflection and exchange, also for comparable fields.

Participation in phase II

In Tuning phase I mainly universities in the traditional sense were selected. This was done in order to match best the subject areas selected and to have a comparable type of institution in the different countries. Well-mapped subject areas from five scientific fields were chosen to avoid further complication of the project. It was expected that the benchmarking of professional profiles and desired outcomes, in terms of knowledge, skills and competences would be easier for this type of disciplines.

Now this approach has proven to be successful, a new challenge is to apply the Tuning outcomes to different types of subject areas. In phase II of the project the Tuning methodology will be implemented in *two new subject areas*: an interdisciplinary programme for which *European Studies* has been selected and an applied science, for which *Nursing* has been chosen. These should serve as examples for comparable types of subject areas. Another important task will be to extend the project to the *pre-accession and candidate countries*.

Therefore, the existing Inner circle of some 100 institutions has been enlarged with another 30 institutions of which some 15 come from pre-accession and candidate countries. Furthermore, to each of the existing area groups one institution from a pre-accession or candidate country has been added. The existing institutions will continue to work on the methodology developed in phase I, but they will concentrate on a number of specific problems that have remained.

Bilbao and Groningen, December 2003

More information

The papers of the Closing Conference, held in Brussels 31 May 2002, the Final Report and Conclusions of Tuning Phase I, which were published in April 2003, as well as other information, can be found on the web sites of the two co-ordinating universities:

University of Deusto, Bilbao (Spain): www.relint.deusto.es/TuningProject/index.htm

University of Groningen (The Netherlands): www.let.rug.nl/TuningProject/index.htm

These websites can also be reached from the Europa server of the European Commission: <http://europa.eu.int/comm/education/Tuning.html>

More information about the project can also be obtained from the following e-mail addresses:

University of Deusto: pbeneito@relint.deusto.es

University of Groningen: i.van.der.meer@let.rug.nl

The Tuning Project was presented at the Meeting by Professor Lupo Donà dalle Rose, Modena, Italy.

The EAAE Socrates Thematic Network ENHSA European Network of Heads of Schools of Architecture. Actions and Perspectives

James Horan, Dublin, Ireland

Ladies and gentlemen, we would now like to commence this session, dealing with the Thematic Networks and the work that has been carried out since our meeting here in Hania last year. Those of you who have been involved in the preparation work between the Hania meetings will be well-acquainted with the fact that significant work and meetings take place during the year to prepare the information which allows us to carry on the debates we do, and I think that we are conscious of the fact that at this year's meeting we have quite a number of people who are here for the first time and, to you, I'm going to ask Constantin to just outline, in very brief terms, where our ENHSA Thematic Network project has come from, what it has done and where it is going. Then we will be able to describe in greater detail the processes that have occurred during the past twelve months. So Constantin, if you will be kind enough to make this introduction for us.

An overview of the Thematic Network ENHSA

Constantin Spiridonidis, Thessaloniki, Greece

Thank you, James. I'll try to be as quick as possible, because I'm sure that for most of you what I am about to say is just repetition. Speaking of the Thematic Network, the European Network of Heads of Schools of Architecture, I would like to remind all of you that it was generated from this city and this event. It was four years ago that the participants at this event decided to move towards such a project. Our application was, fortunately, accepted and now we have reached this present stage. I would also like to remind the few people who are here for the first time that the Thematic Network is not a meeting, but a project.



It is a project with a concept and a number of actions and objectives, which we will try to achieve, and a permanent, annual effort to analyse how it is working and to redefine the objectives towards which our efforts are oriented.

I would like to remind you of the main orientation of our efforts, which is to create the conditions for fruitful debate, dialogue and exchange among all those who are dealing with the administration of schools of architecture in Europe, in order to facilitate our efforts and our work in these schools and to determine our position in the perspective of this common European Higher Architectural Education Area. So, after we had gained Brussels' support for the Thematic Networks program, we first introduced and then implemented four parallel actions, two of which form the pillars of our Network.

The first is the Meeting of Heads, that is to say the place where this debate is developed and where the results and outcomes of all the other activities are presented (since this aspect is very well known, there is no reason to describe it further). The second main pillar is the sub-networks. The first pillar deals with the administration, the politics, the policy and the strategy of the organization of architectural education; the second deals mainly with the content of architectural education. For this reason we proposed four Thematic Sub-Networks – on construction, on restoration, on architectural design and on urban design – as a framework to encourage discussion among the people who teach these subjects and to enable them to exchange and compare teaching practices, teaching strategies and teaching experiences in these areas. You will have in a few minutes the possibility to follow the presentations of those sub-networks.

Between these two main pillars stand two others. One concerns research practice: that is to say, a continuous process of data collection, mappings, and information regarding architecture education. This body of information supports both the meeting we have here and the teaching pillar, that is to say, the Thematic Sub-Networks. The other, which is more or less technical, aims at becoming the centre of the circulation of information and is the web site of the network www.enhsa.net

I would like to say a few words on the research aspect of this project, and then on the way we will work in this meeting. You have already received some information but I would like to make some clarifications that are closely related to the discussion we had in the previous part of this session.

What we started two years ago, and continued more intensely last year, was an effort to understand who we are. Based on the idea that in order to better understand ourselves we must first have a better understanding of others, we tried to develop an extended research or inquiry process designed to yield a kind of X-ray picture of architectural education in Europe through a detailed scrutiny of the schools of architecture. This was achieved through the five questionnaires that we sent out last year; and although many of those who came to Hania last year complained that it was a terrible job to fill out such complicated questionnaires, our aim was to understand exactly what was happening.

The first questionnaire concentrated on the accreditation system applied by different schools in Europe; the second on the exchange practices developed by schools of architecture in their academic life; the third on the structure and the characteristics of the curricula and of the schools that support them; the fourth was related to the links between schools of architecture and the profession; and the fifth was an effort to define the diplomas offered by the schools of architecture in terms of teaching hours per subject area – that is to say, the way that the curricula were structured. This information was

presented – up to a point – in the last meeting; but, as I said, we are in the process of making a more serious statistical analysis of the questionnaires. The results were processed by a team of statisticians from the School of Mathematics of the Aristotle University. Since we are now in the dissemination process, the entire analysis will be codified and presented in report form, so that each of you can see the results. I think that they are very interesting, and I will say just a few words about that.

First of all, we tried to categorize the schools in Europe as small, medium or large, on the basis of total number of students and of the staff/student ratio. And on the basis of these groupings the team of statisticians tried to identify their particularities. It is interesting to see, for example, that there are some different teaching strategies in the different groups, and it is also interesting to find geographically based differences. I remember, for example, that the results indicated that the teaching of construction is less developed in the northern schools of architecture than in the southern, that architectural design is more or less equally distributed in all the schools, and that there are some differences with regard to urban studies and urban design courses in different areas of Europe. So I think that this development, which isn't yet finished because the statisticians want to make some other correlations and some other cross-tabulations, will in the end give us a picture of what is happening nowadays in European schools of architecture.

As I started to say previously, this meeting is part of a project and for this reason it is not just an event. As of last year we introduced a kind of intermediate meeting, in preparation for Hania, which this year took place at the end of February in Antwerp, and was hosted by the School of Architecture of Antwerp, the Van de Velde Higher Institute of Design Studies. There were about 30 participants at this preparatory meeting, representing, 29 schools of architecture (because there were two colleagues from the same school), where we discussed what we would do at this 7th meeting.

As you remember, in the past we split the meetings into four different subjects; curriculum, evaluation, relationship with the profession, and exchanges, which were the subjects that we investigated through the questionnaires. In Antwerp we decided that it was time to become a little more operational and to try to concentrate on curriculum, which is the final objective of our discussions, because, in the end, the curriculum is the heart of architectural education and all the other aspects that we have discussed in previous years – assessment, evaluation, exchange – are included in it.

The first decision was that we should concentrate on the curriculum and dedicate this meeting to that subject. The second decision was that we have to approach this theme of curriculum through the learning outcomes and competences, which was already an open debate through the tuning project and through the discussions that we have had in previous years. Thus the working groups were divided into two parts in Antwerp: one group treated the question of research, which was another focal point raised from our discussions and which we thought must become a very specific subject in our debates; and the other group concentrated on the competences related to the profession or professions of the architect.

The discussion and the debates in the groups were summarized by the group co-ordinators, Kees Doevendans and Loughlin Kealy from the group on research and Lawrence Johnston from the group on profession; the summary reports were circulated to the members, and later, in mid-June, the steering committee worked on these reports and started to elaborate the form of this meeting. In the meantime, and before this discussion in the council, I had

the opportunity to collaborate with Loughlin Kealy who came to Thessaloniki and worked with me for two days on formulating the questionnaires. The two questionnaires¹ on competences that were finally produced were also based, up to a point, on the tuning experience, which served as a very helpful guide for us, but, at the same time, we wanted to adapt them to the particular climate that we have already created in this meeting and the collaboration that we have established among ourselves.

The first questionnaire, which you have already received, had three parts. The first part concerned the competences that Lupo dale Rose presented as generic competences but to which we gave a slightly different definition, because, in our understanding, generic competences are of course transversal but are mainly articulated with the identity or profile of the graduate; so we tried to put together a number of competences which could represent the profile of the graduate. The second part of the questionnaire concentrated on competences related to research and to the education of architects as researchers, and the third part concentrated on the competences and learning outcomes related to the different professional activities that a graduate could develop after graduation.

These, then, were the three parts of the first questionnaire. You probably remember that the introduction to the questionnaire (which is also written in French for the convenience of our French-speaking colleagues) briefly describes its purpose and its aims. Then there are some general questions that ask you to define the identity of the school, the city, the country, and whether or not the school is already within the Bologna framework. Then there is a group of questions related to the profile of the person completing the questionnaire. This is followed by the three parts in which you are asked to grade the significance of each of the proposed competences, on a scale from 1 to 4, for Bachelor's graduates, for Master's graduates, and for Doctoral graduates. For those schools that are not in the Bologna framework there is a column in the middle, which is for Master's graduates or for graduates of programmes of 4-6 years of continuous studies.

Next to each competence – and this is another difference compared to the tuning process – there is a small box which you can tick to indicate whether, in your institution, each particular competence is systematically evaluated by the evaluation processes implemented. This was based on the idea of introducing a kind of benchmarking approach to define those competences that are in some way measurable in your institution, in order to see – and this would depend on your answers – whether there are some competences that could be included in the school's systematic evaluation process, where these exist. The questionnaire ends with a 'submit' command so you don't have to save it onto a hard disc: clicking on 'submit' sends the questionnaire directly to a database, where all this information is stored; and when we have a sufficient number we will ask the statisticians to process it. Be careful to complete your questionnaire on-line – we have received some questionnaires that were evidently completed off-line and only the first letter or so arrived.

The second questionnaire we prepared was addressed to people who employ architects. It has not been circulated yet, because we only made a pilot sample for Lawrence Johnston to circulate among the British schools of architecture in order to see how it works. This questionnaire has two parts, the first of which tries to define the profile of the

employer and includes a list of the types of activities a company might have. It is interesting to see that, although we didn't include graphic design, some of the answers indicated that we should have; so it seems that we have to add graphic design to the list, because this is obviously one of the activities that architects access after they graduate. The first part also contains questions about the number of employees in the practice, the position and age of the person answering the questionnaire, and whether they consider the formal education architects possess has adequately prepared them to work in their company or practice – which is obviously a question to which we are eagerly awaiting the answers. Another question, which is also interesting because it was so strongly articulated in the discussions we have had, is whether employers prefer architects with a more specialized education or architects with a more general architectural education. The interesting thing about this question, based on the pilot results, is that there is a 50/50 distribution between those who prefer specialists and those who prefer generalists, which means that there are two completely different sets of expectations.

The second part of the questionnaire revolves around a list of 35 competences. In one column the employers are asked to grade the importance of each of the competences, and in the second the level to which the expected competence is assured by the educational system, so the one column evaluates the importance of each competence and the other evaluates the degree to which the school offers or assures this competence. Also, for anyone who wants to add competences that are not included in the list, we always leave a blank space at the bottom; and although nothing has been added yet, that will probably change during our discussions. In a final part, the employers are asked to select what they consider to be the five most significant competences from the list they have.

These, then, are the two questionnaires. You have already received the first one, which is addressed to academics, and what we are asking you to do is simply to forward it to everyone on your staff, so that we can receive the largest possible number of answers.

The idea behind the structure of the questionnaires was also applied to these sessions, because what we would like to do in this meeting is to see how efficient it is and what kinds of improvements and ameliorations we could assure through this discussion, so that immediately after Hania we can properly disseminate all this material. That is why we structured the sessions here in three parts; the first concerns generic competences, that is to say the profile according to our understanding of generic competences, the second concerns the competences related to research, and the third concerns the competences related to the profession. And what we are expecting through these sessions is to animate a discussion, which will give us different inputs that will help us to ameliorate and to improve this effort.

For each session we have three simple questions. The first relates to profile: the kind of graduate profile your school wants to pursue, whether your school educates researchers, and the kind of professional identity your school expects from its graduates. The second, which is based on the list of competences that we used in the questionnaire, asks which competence you consider to be the most significant; and the third, which of the teaching strategies you apply in order to assure that those competences are achieved. So these are the three "simple" questions that will be asked of a panel, each time consisting of different schools, thus providing a larger representation of people to animate the discussion; and then we have the other session, for 1 hour and 30 min., which will be open for discussion

and of course interventions and answers from the audience. This is the concept of this event; we expect that we will manage to achieve what we have planned, and I expect your collaboration and help in this effort. Thank you very much.

The Construction Sub-Network of the ENHSA

Maria Voyatzaki, Thessaloniki, Greece

I am the co-ordinator of the Construction Sub-Network, one of the four activities, as Constantin said, of the Thematic Network. When we tried to set up the network of people who teach construction in schools of architecture, we did not know whether it was going to have any future or even whether there was any sense to its creation. Although many burning questions were at stake regarding how we teach construction when design and architecture are moving into different spheres of understanding the world, our first meeting had to be very tentative and very speculative, because it was not easy to start talking about specific things. And of course when I say speculative I mean not only in terms of the content of the meeting, but also in terms of the future and the fact that it might or might not prove to be necessary for us. So we invited the members of the Thematic Network to our meeting, which had the very general title of "The Teaching of Construction in Architectural Education, Current Pedagogy and Innovative Teaching Methods" and which was aimed, by way of our discussions, at defining the state of the art, creating a map of the different tendencies with regard to the teaching of construction in contemporary schools of architecture.

The questions following this general and broad approach to the teaching of construction were similarly generic and general, the basic themes being what we teach when we want to teach construction to students of architecture, why we teach it, how we teach it (in terms of the methodology and pedagogy used to teach construction), who teaches construction in schools of architecture, when is the right time to teach what we teach and, of course, to what extent we should do so. This meeting (and I call them meetings rather than workshops because the whole point is for people to get together, to discuss their cases in depth and of course to learn from each other) was structured in three parts to stimulate debate: the first was to have keynote speakers to discuss the issues we identified, the second was to have a presentation of posters from each of the schools demonstrating how construction is taught in their schools, and the third was to be a debate. So, we had three keynote speeches by prominent people in the field, and it was quite widespread, because the first is primarily a practitioner and only secondarily an educator, as opposed to the second one who is a philosopher/theoretician on construction, while the third was a sort of a hot-off-the-press personality who edits the *Architects Journal*, which is a recognized journal of architectural details and construction in Britain.

The outcome of the meeting was a book, which basically presents the results and the different tendencies – the mapping I mentioned before. You can see the different tendencies regarding what we teach in construction: there is a polarity between innovation and the fundamentals of construction. The answer to the "who" question is primarily practicing architects who teach design in the same school.

The extent to which construction is taught varies in different schools, but I think that the conclusion was that most schools deal with the fundamentals in the first year and leave construction out of their design projects as they approach the diploma – and this of course is a gap that needs to be bridged. The final question, namely how construction is taught, proved to be the most difficult to answer on a speculative basis. The two most important conclusions were, firstly, that the meeting should be repeated (the participants felt very strongly about the need for and necessity of the meeting) and secondly, that we really needed to discuss the methodology and the pedagogy of the subject more extensively.



So there was a proposal that the second meeting be held at Les Grands Ateliers de l'Isle d'Abeau in France (the first meeting had been held at the Aristotle University of Thessaloniki School of Architecture), which is a very innovative centre where students from schools of fine arts, schools of structural engineering and schools of architecture can actually work together on one-to-one scale models with real materials. We were kindly offered their support and the opportunity to hold our second workshop in their building. We followed the recommendation of the participants to concentrate on the issue of methodology of construction, or how we teach construction; and we thought that the way to investigate the teaching of methodology in any given field is to see what exercises are used as vehicles to teach a particular subject, and so we asked participants to present the exercises they give students in teaching construction.

The whole structure of the discussion was articulated around the following questions: how we explain construction to students, how we transmit this knowledge, how we help students to memorize and how they, in turn, do actually memorize the material we give them, and how both teachers and students act. We had two keynote speeches, which were spot-on, one would say, very precise and relevant to the meeting. The second meeting, which had the same structure as the first, that is, keynote speeches, poster presentations, and debates, attracted many more participants (the results are presented in the report that you will find at the reception desk), and it was proposed that we should follow up with another meeting, this one to be hosted by the Technical University of Athens – Spyros Raftopoulos, who is here now, was one of the hosts.

Because up until then we had discussed where we were and how we do what we do, and the next question had to be what we were going to do in the future, taking into account that architecture and the perception of architecture are changing and therefore

what we teach, when we teach it and how we teach it have to change as well, the title selected for the third meeting, which was held last May, was "Visions for the Future of Construction Education, Teaching Construction in a Changing World". And I won't go into details, but since we had this discussion about competences and skills, I will just mention the four main issues that were discussed.

The first was the necessary competences and skills and the education methods necessary to achieve them, when it comes to teaching construction, when the perceptions of contemporary architecture are different from what they were when we developed our existing methods. The second point was that architecture is now using new materials and new construction techniques, so the question arises of what competences and skills a graduate should have in order to be able to use new materials and new techniques, and what educational methods ensure these competences and skills. The third point is the teaching of construction in relation to the environment, which is a fundamental issue of contemporary design. The question with regard to this 'new' need to protect the environment, which goes alongside digital architecture and new materials, is this: what are the competences and skills now required to make a 'buildable' building, and what are the educational methods that will ensure them? Last but not least, there is a body of rare and traditional knowledge that we have to take on board and protect; so we have to make sure, when we teach construction, that the techniques of wood and masonry are not lost with the increasing use of new materials like Teflon, plastics, etc.

These were the four main themes that were discussed at this third meeting, which was very rich in terms of stimulating debates involving a wide range of schools: we had lecturers from the Athens School of Architecture, from the Oslo School of Architecture, from Bath, the Hague and Geneva. And although I haven't kept a precise count, we have gone from 45-50 people at the first meeting to 55 at the second and 65 at the third, and interestingly enough they still want to meet again. I will take this opportunity to thank you all for supporting the event and allowing it to happen, for many of you, I know, have responded by encouraging and enabling your staff to attend. This is more or less what I wanted to say and if there are any questions that I can answer for you I would be more than pleased to do so.

The Theory and History Sub-Network of the ENHSA

Herman Neuckermans, Leuven, Belgium

I happened to be the President of the Association when we launched the idea of the Thematic Network, and I volunteered to initiate the theory and history unit. I focused on one of the subjects because, as the co-ordinator of my University's Postgraduate Centre for the Conservation of Historic Towns and Buildings, I am quite familiar with it. We decided to initiate the network with a kind of preliminary workshop, to which, although the invitation was open, we invited principally people that we knew were active in conservation education. It was a completely different formula from what we have heard so far because it was a very small workshop with only 25 participants. The participants brought to the workshop the answers to a questionnaire that I had sent them prior to the meeting, and which I will show you, and presented the situation in their schools and their countries, 15

countries being represented altogether. And then the same amount of time that was given to the presentations was allotted to discussion. It was a very interesting formula; and one of the conclusions was that although we had intended to make it a bigger event with a wide participation and an open invitation to all European schools, some people thought that it was more interesting to have a small workshop, with 25 people, all of whom made presentations and participated actively in the discussion afterwards.

The aim was to get an initial idea of what was happening in Europe – a limited part of Europe, of course, because of the deliberately limited attendance – through the following questions, to which every participant had to bring the answers as these related to his institution and/or his country.

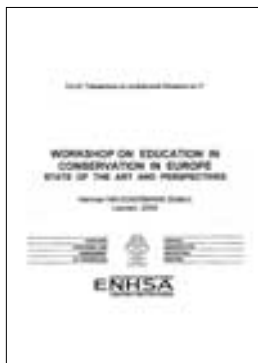
The first question was whether the person participating was actually involved in teaching conservation and, if so, how.

The second was how conservation was taught, which means, among other things, whether it was taught in the under-graduate, graduate or post-graduate programme, etc. I will not go through all the questions, because you can read them and I want to be brief.

Apart from these questions, we had a keynote speech by Jukka Jokilehto who has been the programme director of ICCROM in Rome for many years, for those of you who are familiar with the field of conservation – and for those who are not, I should mention that there are four centres in Europe which are known for their post-graduate studies in conservation, and these are ICCROM, York, Chaillot and the Raymond Lemaire International Centre for Conservation (RLICC) the international centre for conservation that we have in Leuven. Incidentally, ICCROM, in Rome, has changed its ambition to short term programmes; York has shifted its interest to more archaeological subjects; Chaillot, in France, is still there and as most of you know is the school where architects with several years of practice can upgrade their qualifications, earning certificates in special fields, such as *Architecte de Monuments Historiques*. Our centre in Leuven now has a completely different orientation: it has become an internationally oriented centre, with an international student body and staff, and it is multi-disciplinary, meaning that it is not only for architects but also for engineers, art historians and historians, and the core of the programme is their integrated project work.

We began the conference, then, with an inventory of initiatives in Europe in preparation for a bigger event. I have to confess that we are not as far advanced as the Construction Thematic Network, but this is just the beginning. From the reports prepared by the participants in response to the questions we gathered some interesting information, from which I recently prepared a report (published in quite a modest way, due to an overload of work) that has been sent to all participants and member schools of the EAAE and of course copies are still available. The proceedings include all the presentations, the discussions, a summary report, a list of participants and a list of interesting literature. In the summary report I simply highlighted a few of the topics that came up in the discussion.

In terms of conservation, some people complained about the availability of information, since because there is no regulation in this area people can explore a subject and then sit on that information without ever publishing it, which means that no one else can access it. Everyone agreed that there was a need to standardize terminology, for example the meanings of words like renovation, conservation, restoration, etc. It was said that the teaching of history in conservation should be a compulsory subject in architectural education; and although I don't want to begin a discussion on this, my personal opinion



is that in-depth education in conservation should be given at the postgraduate level. I know that in many schools there is a mix of important historical buildings and new design in the final year thesis projects, and it is a very difficult issue for students to cope with, and I think that you need to go through the five years of architecture before you can really tackle it. But this is an issue for debate, because I know it is different in many schools. So, it was proposed to create two working groups, one to discuss the issues of conservation in, what I call, the Bachelor's and Master's level, and then one for what I call the advanced Master's level. So we have a full report, as I said; and while I don't know whether this is the next activity of the Network, I would just like to draw your attention to the fact that, in terms of theory, our association will have a new conference in Leuven next year on the rise of heterotopia, etc. The call for papers is open, and it is about museums, theme parks, squares, theatres, etc. Thank you for your attention.

The Architectural and Urban Design Sub-Networks of the ENHSA

Constantin Spiridonidis, Thessaloniki, Greece

I would like to say few words about the other two Sub-Networks: architectural design and urban design. The approach that we tried to develop in these two sub-networks was a little different to the approach used for the Construction Sub-Network that Maria just described. We thought that the discussion on architectural design and urban design could become much more fruitful and perhaps, more operational, if we had precise material in front of us, so we tried to collect material related to the teaching of architectural and urban design. This is why, last year, we asked all school members of the Network and all school members of the EAAE for contributions structured on four, more or less precise, questions. So I will read you the questions to which we expected to have the answers.

- The first question was: "what do I teach in the architectural design course I teach and why do I choose to teach these things"?
- The second question was: "how do I teach the architectural design course for which I am responsible and why do I choose to teach this course in the way I do"? The third question was: "what exercise(s) and design themes do I use, and why do I think these exercises should be taught for architectural design"?
- And the fourth question was: "what learning outcomes do I expect from the students I teach, how satisfied am I with the course of architectural design I teach and how do I think I could improve my course"?

That was the framework that was addressed to teachers of schools of architecture regarding architectural design, and the questions for urban design were more or less



the same. We received, if I remember correctly, 44 proposals or descriptions of courses in architectural design from different schools of architecture and about 22 proposals for urban design. We collected this material in the form of a report and now, with the help of the European Association for Architectural Education, we will publish this material and distribute it to many schools, not only to those that belong to the Network. The report contains very useful material because it gives descriptions of courses and answers to those questions, most of which are not short questionnaire-type answers but more extensive descriptions of what the schools are doing in these areas.

Meanwhile, this year we sent out a second appeal along the same lines, in order to enrich the number of contributions and to have a more representative spectrum of approaches. We expect that we will manage to gather around 80 answers for architectural design and 40 or 50 for urban design; and what we are planning for next year is to have a workshop like the ones Maria presented, in order to discuss the similarities, differences and compatibilities between the different approaches in these two subject areas. So I would like to remind you all that we sent out the new appeal early in the summer, and to ask you to encourage your staff members to help us achieve the desired number of representative teaching approaches.

James Horan, Dublin, Ireland

Ladies and gentlemen, I am conscious of the fact that we are significantly over the time allocated for this morning, and I do know that we have quite a lot of opportunity in the following sessions to debate many of the issues that have just been highlighted here. However, before we close this morning's session I would just like to make a couple of comments about the Thematic Networks and the significance that they have for the European Association for Architectural Education.

As you know, this is the 7th meeting of the Heads of Schools in Hania and I recall, as many of you here do, that in the early days of these meetings one of the difficulties we encountered was the lack of information that we needed to give real substance to the debates we were attempting to have. The second issue that created a problem for us was the fact that we met only once a year and each year as we came back there was

a certain amount of, I suppose, 'reinvention of the wheel' while we got the process started each time. With the arrival of the Thematic Network structure we were able to do something quite different that hadn't been achieved before.

Firstly, mechanisms were put in place to allow an enormous amount of preliminary work to be done throughout the year between these primary sessions, and the work done in Antwerp, in Thessaloniki and elsewhere, and indeed, the communications that have taken place by e-mail and other methods to allow the information to be assembled has, I think, been invaluable beyond measure. The strength of our organization, as I have always said, has a lot to do with the information we possess. I think that here today, as most of the people in this room are either Heads of Schools or their representatives, we should be conscious of the fact that the Thematic Network goes way beyond the people in this room; it extends to the staff of most of the schools of architecture across the European system, and also to the practices of architecture and the people involved in delivering architecture to the public. Consequently I would just like to finish this morning by asking you to endorse the work of the group involved with the Thematic Networks because, having observed it at close range that work is considerable and it is deserving of your endorsement. Thank you very much.

Chapter 2

Learning Outcomes and Generic Competences for the New Architectural Curricula

What should be the contemporary profile of a graduate from a European school of architecture? Which competences should this person have? Which skills, abilities and capacities should his/her education ensure? How can we rank those competences and learning outcomes? Which are the most significant ones? Can we agree upon a ranking order of those competences? There are different ways to 'translate' those competences in terms of curriculum contents, structures and teaching practices. Can we map some of them in order to have a reference point to inspect them as to different curriculum profiles (ethical-philosophical, structural, operational, vocational, academic, artistic, technical, etc)? How can we construct the European curriculum of each school without looking for harmonisation of its degree programme to any sort of unified, prescriptive or definitive prefabricated curriculum? How can the discussion about competences and learning outcomes become a tool for the protection of the rich diversity of European architectural educations without restricting or damaging the independence of local and national academic authority?

Interventions of Session 2

Panel

Roberto Bobbio, Genoa, Italy

Julian Keppl, Bratislava, Slovakia

Roger Liberloo, Limburg, Belgium

Zoran Nicesić, Belgrade, Serbia and Montenegro

François Nordemann, Paris, France

Ramon Sastre, Barcelona, Spain

Chair

Per Olaf Fjeld, Oslo, Norway

Introductions

In an effort to make the debates at Hania more constructive to all, the organizers considered that it would be important to have the following questions answered by delegates of schools that have already changed or are changing their school curriculum in the framework of the European Higher Architectural Education Area.

Question 1

In the framework of the European Higher Architectural Education Area, what is the profile of the architect-graduate from your School which has determined the direction and orientation of your new school curriculum (i.e. with global architectural knowledge or with more specialised knowledge, artistic, academic, technical, vocational, etc.)?

Question 2

What are the five fundamental competences and skills that your new school curriculum ensures to your graduates in order to enable them to construct the above profile?

For your help we propose to you to use the following (open ended) list

1. Ability to work in an interdisciplinary team
2. Ability to develop a trans-disciplinary understanding
3. Appreciation of the diversity and multicultural quality of contemporary European society
4. Ability to identify and work towards targets for personal, academic and career development
5. Awareness of and respect for points of view deriving from other national and cultural backgrounds
6. Ethical commitment
7. Capacity to develop an analytical and critical thinking and understanding
8. Capacity to apply knowledge in practice
9. Capacity to apply a spirit of synthesis of ideas and forms
10. Capacity to generate creatively new ideas and forms
11. Capacity to adapt proactively to changing situations
12. Capacity to evaluate ideas, proposals, forms
13. "Learning to learn" ability
14. Decision – making skills
15. High level computing skills including the ability to use the Internet critically as a means of communication and a source of information
16. Personal and social skills in expression and communication by speaking, writing and sketching

17. Ability to receive and respond to a variety of information sources (textual, numerical, verbal and graphical)
18. Basic knowledge of all the professional applications of the discipline
19. Responsibility for one's own work and ability to be self-critical in relation to that
20. Knowledge of languages
21. Other.....

Question 3

How does your new school curriculum ensure this profile in terms of:

- Related subject areas (what subject areas can ensure these five competences and skills of the profile)
- Positioning, timing and weight in the structure of the curriculum (in which years of studies are the five competences and skills ensured, in what relation with other subjects, and what is the importance of these subject related areas compared to other subjects in the overall school curriculum).

Chairman's Introduction

Per Olaf FJELD

Oslo School of Architecture, Oslo, Norway

We have fairly little time, but I think that we must use as much as we need, because the three questions that we are going to address are quite essential. It is very important not to lose our focus, because what we are striving for is the quality of architectural education, which we believe will also raise the quality of architecture. It is quite easy to forget that, in a time when information is so broad and can be discussed in so many ways. At the same time the idea of quality is no longer the same; any discussion of the quality of architecture has to be based on many aspects. That is not only a difficulty, but it also puts pressure on each school to find its own profile; and without specific profiles, I think that there will be a lack of quality in education.

To find a profile is a creative act in itself; it is not just a matter of information, or of ideas, or of knowledge. Therefore, one of the essential questions in architectural interaction today is to be able to focus on what specific profiles are. A second question could relate to what content defines a profile, and – as we have stated many times – Europe is remarkable for the diversity within its different schools. I think, too, that to find a profile is also to define the context, which again is a creative act. It can relate to many different types of competences; we see them over and over again, we are able to bring them up, we have an awareness of where and what they are, but from all that to making them a content, from which a fruitful profile can then be made, is another creative act that has to be looked into. A third question could be how a specific profile can be reached, and I think that in many ways it is a matter of timing: how any one of us sees the world and how we want to focus in relation to that, the ability to have a certain focus on the profile and its content lies within the information itself. Therefore, I think, the three issues presented in these three questions are essential, if the aim is to improve the quality of architectural education and at the same time improve the quality of architecture. So it is going to be interesting for the panel to bring out that focus; and I would ask each member of the panel to be as precise as they can in their interventions, and hopefully we will be able to discuss it in the next session.

The idea is for each member to deal with one question at a time.

Learning Outcomes and Competences for the Architectural Curricula at **Bratislava** School of Architecture

Julian KEPPL

Slovak University of Technology Faculty of Architecture Bratislava, Slovakia

I will answer the first question very briefly. To answer this question I focused on the profile of an architect or the profile of our own output, and I would like to say a few words about the history of teaching architecture in Slovakia. We started in 1947, but the real beginning was in 1950 when the faculty of architecture was established. At that time, we created a profile that focused on a thorough knowledge of typology. This was done through the organization of design offices, such offices concentrating on a special type of building. The requirement was for an architect who was able to create that particular type of building, for example, residential buildings, industrial buildings, buildings for culture, and so on. The typology was, you might say, a driving force in the organization of our study programme and our curriculum. This orientation also reflected the structure of the school, which had very strongly typologically oriented departments.

The course of study was organized as follows: students started with a theoretical course on the typology of a certain type of building, and then in the next semester the students followed this up with studio work, the profile of an architect being someone who was able to do projects 'in an envelope', which means the ability to produce a product. Then in 1990, and later in 2002, we passed through quite big changes. In 1990, we saw changes in the political field and the economy, and so also in our school of architecture, so we started a different approach to architecture education, and we also redefined the profile of an architect. It had become necessary to look for a broader profile, and so the traditional typologically oriented departments and studios were replaced by problem oriented studios focusing on themes such as restoration, ecologically conscious design, interior design, and so on. Now our studios are not organized according to building typology, but instead by trickiness and scale. We differentiate between levels of project difficulty in terms of the title of Rem Koolhaas' book *SMLXL*, using the terms 'simple', 'medium' and 'difficult' for projects at the Bachelor's level. At the engineer's or Master's level we use the terms 'difficult', 'extra difficult' or 'extra-extra difficult', meaning that the students are obliged to integrate some new ideas into their design and to look for original improvements or solutions.

Finally, I would just like to add something about the structure of our study programmes. Since our Faculty of Architecture at the Slovak University of Technology in Bratislava is the biggest school of architecture in Slovakia, with about 1000 students and more than 80 teachers, we cover a wide field of disciplines, from building or product design to town planners and spatial planners. Our attention is focused primarily on architecture, but there are also many other fields of study at our faculty. Another thing I didn't mention, with regard to the organization of studies, is that we adopted this two-stage structure, with Bachelor's and Master's levels, in a latent way in 1990, legalized it in 1998, and are continuing it with a slight adaptation of the programme. The difference compared to my

colleagues is that we have a 4-year Bachelor's programme and a 2-year Master's programme – or Engineer programme, as we call it, because our graduates finish with the academic title of engineer-architect.

Learning Outcomes and Competences for the Architectural Curricula at **Vallès-Barcelona** School of Architecture

Ramon SASTRE

Technical University of Catalonia, School of Architecture of the Vallès, Barcelona, Spain

Spanish Schools of Architecture must produce (by law) an architect who must cope with a wide range of competences: Urban and Regional Planning, Building Design, Building Technology (Physics and Structure), etc. In this sense, Curricula from old times have been designed to touch all the necessary matters to provide the supposed level of knowledge in all those areas.

At this moment, Government is trying to adapt Spanish Education Laws to the European Higher Education Area (EHEA), but it appears to be quite complicated, since there are many other laws that assure architects their **exclusive** expertise in the field of building design and construction.

Other professionals claim their expertise in some of those areas (structures, services, planning,...), so there is the possibility that new Curricula adapted to EHEA would allow to separate this complex knowledge of the present architects in different specialists dealing in a narrower field of expertise.

Most of the Schools of Architecture are against it, mainly if we are speaking in terms of Bachelor. If Bachelor would take five years, as was approved by EAAE some years ago, things would change and they would accept Masters to produce specialists from a generalist Bachelor.

In our School (Vallès, Barcelona, UPC), we share most of these feelings. We promote experiences in the curriculum that deepen in interdisciplinarity. The way we teach in the Studios, the free elective subjects about sustainability, third world cooperation, etc. are examples of this promotion.

Learning Outcomes and Competences for the Architectural Curricula at **Belgrade** School of Architecture

Zoran NICESIĆ

Belgrade, Serbia and Montenegro

The general orientation of our curriculum is aimed at **global architectural knowledge** in an **academic framework**. Traditionally, our school developed as a technical faculty (title: engineer of architecture), but has gradually developed in the last 30 years towards a school offering global architectural knowledge. The future curriculum will offer a variety of profiles and optional courses and is basically oriented at developing all aspects of our discipline (artistic, technical, practical).

The basic direction of the new curricula we are developing should have the following tree levels: (3 + 2 + 3 year's full time course)

Bachelor of Arts and/or science level (as a basis for further education and a degree enabling the candidate to work in the field of architecture *without possibility of independent work and license*). The bachelor has basic global knowledge and a general profile, and is competent to participate in various work done in all fields of the profession. During the second and third year of the course, various options are offered enabling the student to seek an adequate profile that can be developed during further studies or in practice. Optional courses will enable students to either work towards a practice oriented profile (in case they intend to terminate their studies on the bachelor level), or prepare for graduate studies during their bachelor years. We expect the majority of students to go beyond this level and into further education (on our faculty or elsewhere, immediately or eventually).

Master of Arts and/or Master of Science level (academic level that together *with results in practice and a successful professional examination produces a license*). On this level, we are introducing various fields of specialized knowledge, basically in *3 recognizable profiles...* **The architect - designer, the architect - engineer and the architect - urban designer and planner**. Additional possibilities for personalizing the curricula are given to all students through optional courses. Themes in the field of **history and culture, planning and management** are also considered as potential additional profiles, and are still discussed as possibilities.

Doctor of science level as an academic level oriented to research and teaching. Up to now, the Doctor of Science thesis was done through individual work of the candidate and guidance of a mentor. Compulsory academic background of every candidate was Master of Science. That was done after a Diploma in architecture / license level (5 years), and Master of Science course (2 years). Of course, the diploma and master level could be acquired in other disciplines complementary to the thesis the candidate chose to work on.

In our new curriculum, and on the basis of new legislative solutions that are being introduced, we now expect to develop an independent 3 year course producing a Doctor of Science that will follow the Master of Science diploma.

Learning Outcomes and Competences for the Architectural Curricula at **Genoa** School of Architecture

Roberto BOBBIO

Genoa, Italy

According to the (last but not ultimate) University reform, as it has been implemented in Italy in application of the Bologna declaration, two different systems still coexist in Italy, to become an Architect:

- a straight 5 years curriculum (without intermediate degree) that leads to a master ("*laurea specialistica*" or, as recently renamed "*laurea magistrale*"); this curriculum continues the tradition of the previous laurea in architettura;
- several "3+2" years curricula; there are two first level degrees that lead to a bachelor (*laurea*), one in architecture, one in planning; the bachelor in architecture has different specializations (architectural design, building construction,); the second level degrees that lead to a master are four: in architecture, landscape architecture, building restoration, planning.

Traditionally, the architects in Italy are pre-eminent professional figures in many fields of activities, including:

- Architectural Design
- Buildings Construction
- Urban Design & Planning
- Landscape Design & Planning
- Architectural Restoration & Conservation
- Industrial & Naval Design

The professional competence of an Architect in all these fields is generally recognized; moreover, a national law (issued in 1929 and recently reformed according to the Bologna Declaration) identifies "Building Construction" as the proper professional field of the architects and the civil engineers and assigns to the architects a unique competence in the restoration of historic buildings.

To work as a free-lance Architect it is compulsory to pass an exam and to be admitted to the National Board of Architects, that has a local board in every province; training is not requested; according to the university degrees reform, a short stage is part of the new programs.

The National Board, according to the recalled reforms and to the new educational programs, is divided into sections and sectors:

- section A includes a junior architects sector and a junior planners sector (with limited professional competences);
- section B includes four sectors: architects, landscape architects, restoration architects and planners (with full professional competences).

Profile of the architect-graduate at the Faculty of Genoa

The Faculty of Genoa, till this moment and for many reasons (immediate opportunities, lack of certainties about the final model that the reform will produce in Italy, etc.) has maintained its traditional "5-years master degree" in Architecture and has applied the "3+2" model only to create the following new degrees:

Bachelors (3 years curricula) in:

- Architectural Design and Construction Techniques
- Urban Design & Planning
- Landscape Design
- Architectural Restoration & Conservation
- Industrial Design
- Naval Design

Masters (2 years curricula) in:

- Landscape Design & Planning
- Industrial Design
- Naval Design

The "5-years curriculum" is intended to develop the "global architectural knowledge"; the "3+2" years curricula are intended to develop specialized knowledge, while all the existing "3-years curricula" are intended to develop professional skills.

It must be stressed that on this subject a strong debate is still under progress in Italy; this debate takes place while the Ministry is carrying on the reform of the university studies in order to apply the principles of the Bologna Declarations and the following UE statements that deal with the creation of a European Space of the Higher Education. Someone intends the "3-years" curricula, within the same class of degrees, as preliminary courses of studies that must provide the students with a basic formation. In this perspective, the "2-years curricula" (were they exist) are intended to specialize this common basic knowledge and to give the students specific professional skills. Some others intend the "3+2" curricula as a whole: a specialized course of studies entirely devoted to lead the student to a well defined professional profile. In this case, the final "2-years" curricula are intended as the conclusive step for acquiring specific skills that can be useful either on the academic and the professional field. The debate is still alive and the final result can nor be foreseen at this moment.

Some of these degrees, established by the Faculty of Architecture, will be jointly run with the Faculty of Engineer beginning with the 2005 academic year.

The "global architectural knowledge" is articulated into 10 areas:

- Architectural Design
- Building Technology
- Construction
- Mathematics & Informatics
- History of Art & Architecture
- Drawing & Architectural Surveying
- Physics for Building & the Environment

- Restoration & Conservation
- Urban Design & Planning
- Social, Economical, Evaluation, Geographical & Geological Studies

The activities in the Italian Schools of Architecture are organized in:

- Courses Lessons (one single discipline: fundamentals and their applications; integrations among disciplines are possible)
- Studio Works (laboratori): more disciplines focused on an a project. In the 5-years curriculum one discipline is predominant. In the 3+2 curricula the studio works can be differently organized; a major orientation is to integrate more disciplines.
- Individual students work (previously approved by the Degree Council) such as stages, courses abroad, language and informatics skills, etc.

Learning Outcomes and Competences for the Architectural Curricula at **Limburg** School of Architecture

Roger LIBERLOO

Provincial Higher School of Limbourg, Department of Architecture and Arts Diepenbeek, Belgium

It's my believe that to understand our answers to the questions, it's important that you now something about the context in which they were formulated. My school, the school of Diepenbeek is situated in a provincial area. The bigger cities as Brussels, Antwerp, Eindhoven (NL) and Aachen (D) are on a distance of about 80km. The school was erected in the fifties of the last century together with a lot of other schools of higher education in a movement of democratizing education. It gave the children of the working class of the province a better opportunity to engage in higher education. We have now 311 students and a staff of 19 fte's spread over 34 individuals. There are 2 professors, 8 lecturers, 22 assistants and 2 visiting professors.

Architecture: 311 students

1AR	2AR	3AR	4AR	5AR
115	65	53	38	40

Teaching staff: 19 FTE / 34 individuals

Student - FTE staff ratio: 16.4 - 1

Professors	Lecturers	Assistants	Visiting professors
2	8	22	2

In the preparation of the academic reforms we put up a new pedagogical structure. We divided the courses in three course groups which form the ABC of the schooling. The A

of Architecture, the B of Building technology and the C of Culture. Each group is subdivided in clusters. Within A there are the clusters of Architectonic Design, Imagery, Architectural sciences and Environmental sciences. B contains the clusters of Structure, Technology and Management & Law. C groups Man and Space, Culture on the Move and Concepts in the making, new names expressing changing insights in how to deal with the humanities and cultural studies in architectural education. In each cluster a chairman is chosen, one of them leads the course group; together they form the educational board with an educational head that is chosen every four years. Within this educational board the course group chairmen form, together with the educational head, the executive board. The Executive board and the educational board had each of them 10 meetings last year. Important decisions were put to the general assembly of all the teaching colleagues, and we close the year with an internal conference to tune up a last time and straighten things out at the closely following barbecue.

Pedagogical structure		
Architecture	Building Science	Culture
Cluster Architectural Design (1)	Cluster Structure (1)	Cluster Man and space (1)
Cluster Imagery (1)	Cluster Technology (1)	Cluster Cultures on the move (1)
Cluster Architectural Sciences (1)	Cluster Management & Law (1)	Cluster Concepts in the making (1)
Cluster Environmental Sciences (1)		
Educational Board (10) + 1 (educational head)		10 meetings
Executive Board (3) + 1 (educational head)		10 meetings
Educational Head (70% head / 30% teaching)		
Department Head		

Within this academical structure we developed some policy instruments:

1. a general document about the academical reforms
2. a self evaluation report presented to the external accreditation commission
3. our ICT- policy
4. an educational concept for architectonic design in the bachelor
5. the competences for the bachelor and the master.

Now, to answer the first question about the profile of the graduated architect: in the bachelor we aim to the centre of the target, with the intention to offer a broad education which gives the student the opportunity to get introduced to artistic, academic, technical and vocational experience and knowledge. The master offers the possibility to differentiate into four directions leading all to an architect's master diploma, that gives admission to architectural practice after a 2 year's term of probation under the supervision of the Belgian institute of architects.

- architectural critique
- imagery
- building technology
- urban design

The option consists in the first master year in the combination of the students choice for a seminar (8 credits), and the preparation of a thesis (4 credits). In the second master year the seminar (8 credits) is combined with the thesis (8 credits) and the final architectural design project (32 credits).

These options with their link to the thesis and (in the future) to the architectural design project form together the ideal environment to develop research.

The Architectural Critique option wants to create an inspiring, non-ideological intellectual space within the architectural education, and foster conceptual widening in the architectural consciousness of the future architect. It works on three domains:

- democracy and architecture, with particular attention to the complex relation between Europe and the USA
- the postmodern (in philosophical terms) architectural design as a meaning creating act of consciousness,
- "old and new", the equilibrium between conservation and development.

"Imagery" concentrates on experience and handling concrete materials, and is build-up thematically, as for instance the last year's subject was "tactility".

"Building Technology" focuses within the framework of sustainability on technological deepening by studying concrete innovative projects. Buildings are studied as a spatial circuit, a constructive structure with a skin (material & construction), detailed and equipped.

"Urban Design" handles 3 domains:

- behaviour and space,
- typology,
- tissue-analysis,

and works thematically. It explores for instance the differences and similarities in housing and living in the border region of the river Maas in Belgium and the Netherlands.

Our care to establish the PHL-profile of the graduates must be seen also against the background of our mission-statement, which makes clear our point of view concerning the fundamental values of communication and transparency, our understanding of the professional field, the professional skills of the architect and the basic intellectual attitudes of an architect about conceptual thinking, raising awareness and processing information.

- point of view concerning the fundamental values of communication and transparency,
- viewpoint concerning our understanding of:
 - the professional field,
 - the professional skills of the architect
 - the basic intellectual attitudes of an architect about
 - * conceptual thinking,
 - * raising awareness
 - * processing information.

Learning Outcomes and Competences for the Architectural Curricula at **French** Schools of Architecture

François NORDEMANN

Normandy / Paris Bellville Schools of Architecture, France

I am speaking from a very special situation, for two reasons. The first is a French reason: France is at the point of installing the Bologna Process, so this back-to-school week will be the key moment for how all training schools in France will practice an attitude that up until last semester they had been only working on. Secondly, from a personal point of view, I am also in a special position: having recently stepped down as Dean of the school of Normandy, I am at the moment neither a Dean nor a teacher. In any case, this should help me to be really short, which could help many people here, I guess.

The idea of the curriculum we are working on basically rests on a non-professional focus, on learning a discipline within its specific controlled environment. This means that we are trying shrink the field, to shrink the domain in order to concentrate on design processes. This opens the field to many attitudes; it opens it to all sorts of different characters and different ways of approaching the discipline, whether formal or scientific or academic. This is an evolving situation, but an existing one nonetheless.

The idea is to get rid of the professional focus so that, by shrinking the real, by shrinking the curriculum to the core of architecture and design processes, we can open it to older, different, kinds of professions. We are happy to see architects in other professions, such as planners (who are not practicing architects in the sense of erecting buildings, but who have programme specifications as designers, and whose clients may be public or private institutions), experts in preservation, experts in maintenance, or experts in urban policies. I think that this is a balanced situation, where an architect working as a practicing builder can speak to other architects in the same field but in other professions. I would insist that designing a curriculum is a creative act for each school, as a specific way of thinking and of getting into methods (whether in construction or history or sociology) and skills (e.g. communication, drafting, computer design, graphics, etc.). And maybe, to echo Professor Lupo Donà dalle Rose this morning, the idea is to tune a curriculum in order to make music rather than noise.

Learning Outcomes and Competences for the Architectural Curricula Questions 2 & 3

Per Olaf Fjeld, Oslo, Norway

Thank you very much, for your interesting comments. The first round is finished, and I think that we have to combine the second and third questions. If it is possible to get through the questions, we should, but first I have a general comment to make on the first round. I think that the idea of profile should be investigated much more seriously, because the relationship between profile and content is not necessarily clear. Of course, the content itself can give the profile; but the profile can also offer the content, and in that sense, a lot of clarification is required from each of the schools. And if that happens, we could understand more precisely the core of what the schools stand for. In a similar way, precision and variety within the discussion would also help clarify things considerably. I think that the idea of the profile, and the capacity of each school to find a profile are very fruitful issues. Now we go to the second and third questions.

Julian Keppl, Bratislava, Slovakia

Going on to question number two, we stress the ability to develop a trans-disciplinary understanding, because the profession of an architect is becoming more and more that of a person who puts things together, a co-ordinator. Architecture is now the art of putting many different things in one harmonious whole, and so, from that point of view, we think that the ability to communicate with other professions is very, very important. Our next priority is awareness of and respect for points of view deriving from other national and cultural backgrounds. Since we are in the center of Europe, we are used to communicating with various cultures, as we are on the crossroads of many cultures and we have the privilege of being on the border between west and east and the passage from north to south. The famous Linus Romanus, for example, goes through Slovakia, and also we were on the borderline of the Iron Curtain, so that for us communication and the knowledge of other national and cultural backgrounds is very important. The next priority is the capacity to apply knowledge in practice. As I mentioned, our tradition is to educate architects for practice, and we still have quite a good ratio of graduates who work directly in architecture – I would say roughly about 60-70%, and of these approximately 20% work abroad. So I think that from that point of view we are a quite successful institution. The creative capacity to generate new ideas and forms depends, I think, on each individual architect, so I will not comment more on this point. The fifth priority is high-level computer skills, including the ability to use the Internet as a means of communication and a source of information. We think this skill is now crucial for architects.

Roberto Bobbio, Genoa, Italy

With regard to the second question, I will try to be very brief. It was not easy to make a choice, but we discussed it among ourselves and we reached a consensus. The five-year Master's degree and the 3+2-year degrees have different stresses and different focuses. For the five-year Master's degree the capacity to generate creativity, to be creative, has

always been a feature of the education of the Italian architect, and is still probably the first point. Then come the capacity to synthesize ideas and forms, the ability to work with other people, personal rather than social skills in expression – this is something that we stress, even though it is not always possible to transmit it to our students – and, finally, the ability to receive and respond to a variety of information sources. The new degrees stress ability to develop trans-disciplinary understanding, to use different disciplines to collect solutions, again the ability to work in teams, capacity to be practical, basic knowledge of all the professional applications of the discipline, and again, personal skills in expression and communication. Thank you.

The 5 major fundamental skills

5 years Master degree	3+2 degrees
Capacity to generate creatively new ideas and forms	Ability to develop a trans-disciplinary understanding
Capacity to apply a spirit of synthesis of ideas and forms	Ability to work in an interdisciplinary team
Ability to work in an interdisciplinary team	Capacity to apply knowledge in practice
Personal [and social] skills in expression and communication by speaking, writing and sketching	Basic knowledge of all the professional applications of the discipline
Ability to receive and respond to a variety of information sources	Personal [and social] skills in expression and communication by speaking, writing and sketching

How the 5-years curriculum ensures the stated profile

Fundamental competences and skills	More involved areas	How	When
Capacity to generate creatively new ideas and forms	Architectural design Urban design Construction Drawing	Studio works	Every year
Capacity to apply a spirit of synthesis of ideas and forms	Mathematics History Architectural design	Lessons Class work Home work correction	Above all last three years
Ability to work in an interdisciplinary team	All the areas	Studio works Final Thesis Research Application	Above all last two years
Personal [and social] skills in expression and communication by speaking, writing and sketching	Informatics (ICT) Drawing Restoration Design (urban, landscape, architectural)	Studio work Student reports (presentation of Analysis, Diagnosis, Projects) Work evaluation	Every year
Ability to receive and respond to a variety of information sources	All the areas	Lessons Seminars Group work (studio and home) Work evaluation	Every year

Ramon Sastre, Barcelona, Spain

The five fundamental competences and skills that school curriculum intends to ensure to graduates are:

1. Ability to develop a trans-disciplinary understanding
2. Capacity to develop an analytical and critical thinking and understanding
3. Capacity to apply a spirit of synthesis of ideas and forms
4. Basic knowledge of all the professional applications of the discipline
5. Responsibility for one's own work and ability to be self-critical in relation to that

One of the particular features that characterised our School is the way we teach in de Design Studio. Traditionally these studios were led by Design Teachers. Now in our school, these teachers join with others from specific areas, creating diverse dual teams: design+planning, design+structures, design+drawing, etc. or even teams with three areas together.

Once we have these teams, subjects to be developed by the students during the course must be appropriate for the team in order to make students understand how related these different pieces of knowledge are.

On the other hand, traditional self-explained subjects as construction, structures, drawing, etc. leave part of their contents (mainly practical part, exercises, examples ...) to be done in the design studio. And not only that: teachers from these subjects can check what students have learned in their classes, or at least what they are able to apply in a design. This means that the teachers are able to emphasize some points or go over other ones so that students get what is really important in the subject.

Precisely, this is one of the issues that sometimes generate more arguments among teachers. It is quite normal that teachers think that their subjects have not time enough to be explained or practiced. Even some of them consider that subjects to big (in terms of credits) produce an automatic negative consideration to small ones. If we have, for instance, a studio with 30 credits and 6 other subjects with 5 credits each, students tend to see something "important" and other things that are "neglectful".

In our school we have semesters with 37.5 "old credits" (30 ECTS). Around 15 old credits are devoted to the studio and the rest for other subjects. And of these 15 old credits, 9 credits are given by design teachers and 6 from teachers coming from other areas.

Finally there is the Final Thesis Project. This is a hard work students must do before graduating. It is a complete work where equilibrium in their proposals is one of the main issues. It is not a "real" project as it was called, may be twenty years ago, since a "real" project nowadays is something huge, full of calculations, texts, reports, laws to be accomplished, etc. But it is in this work where students show us the capacity to develop an analytical and critical thinking and understanding or the capacity to apply a spirit of synthesis of ideas and forms, just to mention two of the five points we have checked in Question 2.

Roger Liberloo, Limburg, Belgium

We listed 12 general competences, and 47 specific competences for the bachelor, 46 for the master

These competences were first formulated within the branches of the educational structure, decided on in the educational board and one colleague did the final editing, but it still needs further development.

The competences were structured in 4 groups:

- Analysis and interpretation
- Design
- Realisation
- Communication

Competences concerning research are interwoven in these 4 groups.

The difficulty doesn't consist in naming five fundamental competences, but in choosing which would be the five fundamentals. Probably there are more than five of them. We consider our general competences as being the fundamentals. They are twelve and about possessing an intellectual ground attitude, thinking and acting out of a broad interest, thinking and acting multidisciplinary, tackling problems scientifically, researching systematically, thinking conceptually, taking a creative and imaginative stand, critical reflection, communication, organising adequately, thinking and acting ethically and internationally.

Nevertheless, a more concrete example for the group of "Analysis and interpretation":

"the capacity to subject architectural spaces and designs to research in the field of usefulness, liveability and experience, and to present this research in a report"

or

"the capacity to reduce the complexity of a given design context to design criteria".

As I pointed out last year, when we define a competence, we should take in to account also things concerning context, result or products, processes, activities, resources, parties involved, problems, attitude and measure of independence. This would lead us to far in our 5 minutes margin of today. To establish competences in this sense, thorough and patient thinking, writing and communication is needed, because doing this requires to explicitly formulate all the things we did implicitly for almost 25 years.

In Design:

"the capacity to reflect critically on one's personal design approach and to be able to use this reflection to develop this personal approach "

or

"the capacity to make the expression of a building tangible by choosing materials and detailing that realize the desired imaginative qualities on every scale level ".

In Realisation:

"the capacity to develop and work out a research project / an architectural project systematically".

In Communication:

" the capacity to consult with a client in a given context about the urban, architectural and technological options ".

1. The old curriculum wasn't that bad, so we kept a lot of it!
2. The work of working out the competences according to what I said about it before, and relating the competences to the subject areas and vice versa is a long winded task. We need another year for it and a well defined and well structured database.
3. New subject areas we introduce in the first bachelor:
 - learning process and handling information,
 - introduction to research.
4. Radical reform of the history course. From chronological to thematically, we want to develop the historical consciousness and methods of approach in stead of memorizing 3 millenniums of architectural facts.
5. A first global answer to the question which competence is realised within which subject area, showed us clearly that interdisciplinary work should get much more attention.

	Competences within one subject area	Competences within interdisciplinary teams
Bachelor	46%	54%
Master	18%	82%

6. Implementing a one week practical experience in the three years of the bachelor:
 - 1) observing and analysing existing buildings and interviewing commissioner, contractor and architect,
 - 2) spreading the week over one year and observing and reporting the realisation of a small building
 - 3) spreading the week over one year and observing and reporting in an architectural office the activities concerning one building.
7. Implementing new pedagogical approaches in the studio:

8 hours of studio will not be anymore 8 hours of individual consulting, but will especially in the first two years be structured in:

- a one hour lecture,
- three hours of special and well focused practice
- and four hours of consulting about the individual design project;

Beside it, we try to penetrate the often obscure design process by introducing the terms "mimesis" , "transformation" and "creation" in the pedagogy of the studio and by using within this framework a second layer of design methodological parameters.

8. Using a template, a gentle reminder for every design project with:
 - title of the module
 - the team: year coordinator, responsible colleague in charge, assistants, supporting lecturers, visiting lecturers and professors

- the competence oriented assignment: the assignment has to be formulated mentioning which competences will be dealt with explicitly, methodically and therefore demonstrable
- design methodical specificity: the specific design method that will be put central in the learning process of this module with:
 - a specification about mimesis, transformation or creation, and
 - the design methodical parameters
- educational description of:
 - the lecture
 - the practical training
 - the consult
 - individual independent work
- planning and timing
- the research aspect: a short description of how and in what measure the module realizes the aspect of research directly or indirectly. Not every module has to do this in the same direct measure.

Title of the module

The team

Co-ordinator of the year:

Chief responsible of the module:

Assisting architects:

Supporting lecturers:

Guest professors:

Competence oriented assignment

The assignment is formulated in terms of competences, so that they can be thought explicitly, methodically and as such, demonstrable. (we use a list of numbered competences)

Design methodological characteristics

Here follows a stipulation of the specific design methodological approach that is central to the learning process of the module with :

1. a specification about : mimesis, transformation and creation
2. the design methodical parameters.

Educational description

Here follows a short description of :

1. the lecture component
2. the practical training
3. the consult
4. the individual independent work.

Timing

the number of weeks, the planning of the concrete activities and when which documents have to be handed in.

The research aspect

A short description of how and in which measure the aspect of research will be realised directly or indirectly in the module. The aspect of research doesn't have to be incorporated in every module.

François Nordemann, Bellville, France

To answer the second question, and I am speaking on a very global basis, not just for Belleville but for the twenty schools in France, what we are trying to do is to define the requirements, which – whatever they may be – are not actually spelled out. But, for instance, developing trans-disciplinary understanding or the ability to work in teams are not things that we teach, but things that we practice. Teaching these things is not our goal. It's like reading, writing, sketching, counting: they are expected to be able to do things, but we don't teach them – we practice them so that they can improve their skills. Besides that, and in addition to the core that I was describing before, we are developing and offering a range of different methods, whether in philosophy, in history, in calculating, or whatever, but these are more attitudes to enable the student to get to something else. And in addition to methods we are also teaching skills, but again with the idea of developing an offer, offering them to the students, so that they can create their own path with whatever the faculty can offer them. Thank you.

Per Olaf Fjeld, Oslo, Norway

Thank you, for your generous remark. I have one final comment to make. For many years now the EAAE has been able to produce very precise knowledge, and that knowledge was necessary to create a base from which the discussion could proceed. This knowledge, even though it may be of use to us, may not necessarily be interesting to anyone else unless we are able to reconstruct it in some way. In that sense these three questions are essential, and I think they should be further worked upon – including in relation to what this panel has said and done. If we continue to produce information that we all sense is unimportant in itself, and if that is not able to inspire the ideal profile and the ideal content, I fear the information will simply remain as information. So, there is a challenge that I think should be taken very seriously. I thank the panel for their contributions and all of you for listening. The panel is closed. Thank you.

Discussion

Coordination by

Per Olaf Fjeld, Oslo, Norway

Spyros Raftopoulos, Athens, Greece

I would like to address a question to the panel: Which is the character of the bachelor degree in relation to the practice of architecture and whether the people that finally qualify should be called architects or just people that have a certificate but which is of a lower quality and value in the professional practice of the country. Thank you.

Per Olaf Fjeld, Oslo, Norway

I ask Julian Keppl to comment on the question first. Thank you.

Julian Keppl, Bratislava, Slovakia

Regarding this principle of education of architects, I hope that we are speaking about education and not about training, because, in my opinion, these are different things. In thinking about the Bachelor's degree or that principle, taken from the United States and Great Britain, we recognized some positive points. One very strong argument, in my opinion, is that a curriculum that covers five or (for instance, in my country) six years is less amenable to change than a shorter programme; that was one of the reasons that we adopted the two-stage study in the early 90's.

Regarding the relationship to practice, we do not have enough information from the profession, because as yet only a handful of Bachelor's graduates have left school; the majority want to continue their studies. But I know that some colleagues like to employ Bachelor's graduates in their practice because they are cheaper than architects. Architects are creative people, and all most of them want draughtsmen or assistants, and for that purpose a Bachelor's degree is quite adequate. As I said, we perceive the Bachelor's degree as a first stage, and we believe that most Bachelor's graduates will continue, but we are awaiting the reaction of the profession. From our point of view a Bachelor's graduate, as a professional, should be responsible only for certain small tasks, not for larger projects, and should work under the supervision of an authorized architect. As I said in the beginning, the idea of a relatively short and therefore easily adaptable study programme is a good one, because the lifetime of a study programme is sometimes very short due to new information and new circumstances. So this is the first point, and the second is price on the labor market.

Roger Liberloo, Limburg, Belgium

By Flemish law the diploma of Master's of Arts and Architecture is equal to a diploma of architecture, but, as I said before, graduates have to do a two-year probation term under the supervision of the Belgian Institute of Architects before they can work independently as architects. What will happen with the Bachelor's degree, I don't know; it is new for us.

Stefano Musso, Genova, Italy

Genoa has chosen a sort of middle course between the two conflicting extremes that exist in Italy. Some faculties have opted for a three-year curriculum as the first step in a generalistic formation within the field of architecture rather than a deeper and more professional profile, as opposed to the Master's degree, which is seen as a more specialized education characterized by different specific fields of activity. In this perspective, a Bachelor's degree is not a gateway leading directly into the professional world. Other schools have chosen another way to create Bachelor's degrees, focusing more on the practical and professional profile, with specific themes and fewer common subjects, even if they all belong to the general field and general frame of architecture studies. Also, the relations with the professional orders are different in the two cases. Genoa has chosen to create different titles, partly because they belong to a tradition of the school – for instance, the penchant for architectural restoration. Genoa is a very stratified historic town, so architectural restoration is a natural subject, but even so we haven't decided to create a Master's in architectural restoration.

The students that stop after taking a Bachelor's degree from our school can become technicians – people who can undertake general problems at a construction site, an analysis, diagnosis, developing a service and so on – but they are not able or authorized to undertake a project by themselves. If they want to continue, they can enter again for the five-year curriculum and become architects, or they can go away, for example, to Rome, where there is a Master's in architectural restoration and preservation.

The same goes for the other Bachelor's degrees, for example, urban design and industrial design, even if these are not the same class of degree in Italy. The Bachelor's degree in architectural design and construction techniques, on the contrary, is intended more as the first stage of the five-year curriculum, the intention of the faculty being that when students have completed the Bachelor's degree they enter again for the five-year programme. We must take into account that, at the beginning of their studies, a lot of students are not sure whether they will be able to continue and complete their studies, but we are trying to make a more specified profile, in this field also, using a connection with the faculty of Virginia to create more specialized technicians that are able to work in construction companies, at construction sites, in the public administration, etc., in support of the professionals.

In any case, the National Board of Architects has been reformed along exactly the same lines as the University system: the law-makers have instituted two main divisions, senior and junior, each of which is in turn subdivided, the senior into four fields – architectural design, conservation and preservation, urban planning, and landscape planning – and the junior into two broader ones, architecture and planning, simply because it is expected that junior architects will be using their abilities, their competences and their skills to support the work of the senior architects. I don't know what the outcome will be, because we are still at the beginning of our experiment and there is a huge and hard debate in Genoa and in Italy in general.

François Nordemann, Paris, France

In France, we have that major system that has just been installed and that we assumed would help the student get a taste and some understanding of what I call 'design attitudes'. In addition to that we are trying to encourage the students to learn skills, not general

skills, like drafting, but special skills, such as photo-shopping, which may be slightly outside the general field of architecture but can be useful to architects in developing their ideas. The other point I would like to mention is that we are worried about whether other universities, that are not specialized in architecture, might be able to create Bachelor's degrees outside of the architectural system. That is something that could happen, and although we don't know when or how or even whether there is anything to worry about, we are nonetheless concerned.

As for our Master's degrees, these are national diplomas with a specific orientation, such as urban design, or formal design, or some functional aspect, etc. They give students the title of Master in Architecture; but in order to become practitioners able to sign building permits, they have to get a license that is delivered jointly by the French National Board of Architects and the Ministry of Culture. This is an in-between situation that nonetheless is very efficient, because it gives graduates with Master's degrees a variety of places to work where this licence is not required, in big architectural offices, for example, or in the same field but in other professions, such as programme specification experts, etc.

Ramon Sastre, Barcelona, Spain

In Spain, it is not clear at the moment whether the Bachelor's programme will be three or four years, and that will be the determining factor. A three-year programme would just be a first stage but would not lead to professional qualification. With this kind of Bachelor's degree you could then choose one of specific fields in architecture, or change to engineering, or go to another school or country to do a Master's programme. A four-year degree, on the other hand, would allow for some professional responsibility. Nothing is clear yet, but there is talk of allowing such graduates to co-sign designs, as long as they are working with a fully qualified architect. Another proposal is for them to sign only for 'small buildings', but in that case we have to define what we mean by a 'small building' (complexity, surface, etc.). So at the moment, I think that the best thing is to view it as a step to change, although one can, of course, work with a three-year Bachelor's degree in, for example, an office, but with no professional responsibility.

Zoran Nicesić, Belgrade, Serbia and Montenegro

We haven't had any experience as far as Bachelor's degrees are concerned, because up until now we haven't had any; but the idea is to make a curriculum that is more or less compatible to two major realities: one is that people do not have the same capacities and the other that people do not have for whatever reason, material or other, the ability to go on; and we expect to develop various fields in architecture, on the higher level, because of the various interests that those same students have.

We expect the Bachelor's level to be a temporary status: it will entitle the graduate to work in some area related to architecture, perhaps computing, bureaucracy, site-building, or helping in any kind of studio. If you consider that the number of highly educated people in Serbia and Montenegro, for example, is only between 4 and 5%, which is very low, and if you consider the per capita income as well, then it is quite clear that we would rather have a larger number of Bachelor's graduates than not have any educated people at all. This is one of the reasons why this 'take it or leave it' system of zero + five is not the best option for us. Of course this Bachelor's level also tends to be compatible with mobility and some other principles.

On the other hand, the Bachelor's level cannot be a basis for acquiring a license and a Bachelor's graduate cannot be a member of any kind of professional association that has the word 'Architecture' in its title. In order to be a professional and fully licensed architect one has to have completed a five-year programme plus a certain number of years in practice, to have achieved some results in those years of practice, and to have passed an exam. It may be possible for a Bachelor's graduate to have the practice, but he doesn't have the right to take the exam before he has finished his basic schooling.

We also expect to be able to develop a system of evaluation at the Bachelor's level that will screen out those who should not be encouraged to complete the five-year training period. As things stand in Belgrade, for example, the greatest hurdle is actually entering the programme; once a student is in, as long as he is tough enough he will find a way to finish his five years of training. This means that, in a way, we are actually working against ourselves by lowering the level of the criteria for a diploma in architecture. If there were some kind of intermediate level evaluation, we would be able to stop students from continuing or to require a certain level of quality from students continuing their studies. So those are the major reasons why we have decided to have this two-level schooling. I have one final comment to add, that although we are a state university we have a mind of our own, and if at any point the state or the government tries to give Bachelor's graduates the right to practice architecture, and as of that moment we will stop awarding Bachelor's degrees.

Per Olaf Fjeld, Oslo, Norway

Thank you. I do think that we are only at the beginning of these changes and we really cannot yet foresee how far-reaching they will be. On the European level, they will certainly change architectural education, they will change architecture and, I think, they will also change the profession. So far we only have an awareness of these changes, but I think they will be quite extensive. Therefore, let us return to the three questions: if within this framework schools do not have the capacity to produce their own profiles and develop their own content, then I think it is going to be quite 'open' out there in terms of the competition with other schools and with other initiatives related to space. So I think we are just at the beginning of this discussion...

Christian Huetz, Regensburg, Germany

I have a feeling that most people think that everyone who embarks on an architecture programme will end up working as an architect; but this, I believe, is precisely what you do not think. I think that we should give architecture students a chance to complete an academic cycle of studies and earn a Bachelor's degree. This is an example of a modern trend: first three years of study in one field – architecture, for instance – and then switch to something else. Students should have this possibility, for we must be aware that not everyone who starts to study architecture will end up working as an architect, as used to be the case; when I started out it was natural for me to assume that I would eventually become an architect (the fact that I am now a professor is beside the point).

I come from the state of Bavaria, which has two borders: one internal (with the rest of Germany) and one external (with the rest of Europe). In Bavaria we have both a Bachelor's and a Master's programme and our Board of Architects came up with quite a clever suggestion to accommodate the two systems. Graduates of the three-year Bachelor's

programme do not have the capacity and are not allowed to work as architects. They may have the knowledge and the skills, but they do not have the capacity. Only a Master's graduate with two years of practice can join the Board of Architects. But a Bachelor's graduate who wants to be an architect can, after six years of practical experience, sit an exam held jointly by the Board of Architects and the Universities. That, I think, is a very clever solution to allow people who want to be architects to complete their professional qualifications.

Per Olaf Fjeld, Oslo, Norway

Any comments? This is, of course, a point we often come back to. I think we all realize that not all those who study architecture, especially in the three-year programme, will practice as architects; but at the same time this raises the question of what architecture education is and how it should be structured in the future to achieve the type of qualities we want to pursue.

Roger Liberloo, Limburg, Belgium

In Flanders, a student who has done two or three years of architecture can easily switch to industrial engineering (which is a four-year diploma), since he has had enough mathematics and physics to continue in this field.

Per Olaf Fjeld, Oslo, Norway

Any other comments related to the same issue?

Guido Morbelli, Torino, Italy

I think the question raised by our Athenian colleague is extremely crucial. If, as I believe, we are going into a general application of the 3 + 2 system, then what does the junior architect do? Now, as far as I know, the only country with a long tradition of Bachelor's graduates being able to exercise certain professions is Britain; and I had hoped to learn something from British people here, but since I haven't seen any professors from British schools I may have to write directly to the RIBA. The point is, as my Genoa friend and colleague said, that we made the 3 + 2 system and the order of architects has gone along with it, but we don't really know what a junior architect is allowed to do because there is no legal provision for this case. There are only very vague words, vague assertions, but that is not enough; there has to be a law.

Now I think that there is a reason why it is not clear what junior architects can do, and this might affect other countries that are going to adopt the 3 + 2 system and that have to reach an agreement with their professional organizations. The reason is that the order of architects is strongly opposed to junior architects because they think of them as competition, but that is not the case. This happened in Italy – not because Italians are bizarre, but for very practical reasons – and it can happen in other countries, so there has to be a very clear agreement with the profession as to what junior architects can do. I come from the Torino Polytechnic, which was one of the first schools in Italy to generally apply the 3 + 2 system to engineers and architects, and I, as head of a course of studies of one chair in the Torino School of Architecture, can control what is happening there. We are already in the fourth year, so some of our students have already completed

their three years of study and have earned their laureo, but not one of them, as far as I know, has left.

The main reason why they go on is that we have a tremendous problem in the form of professional surveyors who do almost everything; they are the kings of the countryside and the small towns. Some people even say that they have the power to perform marriages! Many students reason – very simply – that there is no point in their leaving after three years to go and do something that they really don't know how to do, when in any case they will have to compete with the surveyors and will therefore never do anything but minor work, and certainly nothing connected with architecture.

Turning to another point: the theme of one part of this workshop was how schools can construct European curricula without focusing on harmonization with the Greek programme to create a unified, definite, prefabricated, prescriptive curriculum? This workshop, however, had so many questions on its agenda that it was absolutely impossible to answer even one, let alone all of them, in such a short time. I suggested that we use the results of the EAAE questionnaires to work out a simplified minimum curriculum that would become more or less compulsory in all countries in Europe, and of course we have to come to an agreement with the European authorities. And so I think we should work on a unified dual-level common curriculum for Europe, because the free circulation of architects guaranteed by the Schengen Treaty is bound to increase, but it cannot work if each country has its own system and architects in some places study for four years and in others for six. So I think that the EAAE can be of great help in working out something that will lead to unification of the curriculum. Thank you.

Per Olaf Fjeld, Oslo, Norway

I think it is interesting that this confusion, if I may use the word, still continues to exist, and it indicates the complexity that we will be facing in the future. Let us, just for a moment, take one fairly clear example: for a very long period of time Scandinavia had a 5- to 6-year programme, and when one had completed this programme one was called an architect and could go out and practice; it was as simple and uncomplicated as that; and it is fair to say that it did not have bad results. Within the current system, where nobody is sure of what an architect is or is not, there has to be an additional set of rules that was never needed before in order for the government and the professionals to secure a standard of quality. Under the old system newly graduated architects could go out into the professional world and compete directly, which meant that buildings were being created by young architects, which was essential within the tradition of Scandinavian architecture. With the openness that now exists, and I am not putting a positive or negative charge on it, I don't think that we can foresee the changes that this will bring about. Which takes back to our three questions: if we are not precise on this, either as a body or, most importantly, as individual institutions, I think that we will find ourselves trapped in a situation in which the competition among architecture schools will be much harsher than ever before.

Adalberto Del Bo, Milano, Italy

In Italy, whenever the subject of the 3-year Bachelor's programme comes up, and what these graduates can and cannot do, someone always mentions Germany, as an example of a country with Fachhochschule that produce fully fledged architects in 3½ years, that

is, seven semesters. Whether it is true or not, the fact that there is such a difference in length of programmes and that in some cases people can become architects in as little as 3½ or 4 years, makes the discussion very difficult, and in fact quite impossible.

Constantin Spiridonidis, Thessaloniki, Greece

Dear colleagues, we have now spent at least three years trying to map out the possible professional activity of those who graduate from a Bachelor's programme; we, a body of academics, have been expending our energy and our brain-power on trying to invent jobs for them. This is not our job. It is up to those who decided to create this Bachelor's degree to solve the problem. We are here as academics, and as academics we have to discuss what the profile of an architect should be. Four years ago we decided that for someone to be entitled to be called an architect he had have completed at least five years of study, so I don't think that we should waste any more time trying to define the potential professional activity of a Bachelor's graduate. What we should be doing is sticking to our academic identity and defining the identity of the people we will be offering to society as architects. Three years is more than enough for discussing this kind of issue.

What I found most interesting about today's discussion is the fact that we have six or seven cases of a new curriculum on the table; and I would like to ask the intervenants whether they are using the new curricula as a means of creating a new architectural identity or whether they are adapting the previous conceptions of architectural identity to a new system of studies. For me the crucial issue is this: does Bologna offer us an opportunity to re-think and redefine a new profile for architects or does it oblige us to adapt existing practices and conceptions of profile to the constraints of a totally different system? This is a question that we obviously cannot answer now, but hopefully we will have an opportunity to discuss it later.

Alexander Kudriavtsev, Moscow, Russia

I agree with Constantin that we have our own academic tasks, but I think that we cannot promote our obligations without collaborating with the professionals, because that is where the demand is coming from. And we can leave the Bachelor's graduates where they are, but we must remember that they are really the future architects; they work with licensed architects, where in most cases they are exploited, and they have no social protection, so we must acknowledge their situation and we must recognize and support their special status. Just as the Commission for Architectural Education understood that it is impossible to work solely within an academic framework, and invited representatives of the UIA, a professional committee, to its meetings, so too I think that it would be very useful for us to collaborate with the UIA and use their experience in a similar way. Thank you.

Per Olaf Fjeld, Oslo, Norway

Any final remarks or questions?

Joaquim Braizinha, Lisbon, Portugal

Thank you. I would like to give you some idea about the current situation in Portugal in

relation to architecture, following the Bologna Agreement. Our Minister cleverly decided to appoint commissions for each scientific area; the architectural commission is headed by Domincos Tavares, who up until then had been the director at Porto and who was here with us for many years. And Domincos Tavares began talking with all of us, who are connected with the direction of schools in Portugal, about things like whether Bologna really brings anything new to architecture in the matter of teaching and learning.

The idea of more learning and less teaching was something we implemented a long time ago; with practical training, design projects, and so on, the goal of more learning and less teaching has already been achieved. In Portugal, the new paradigm that Bologna proposes has been part of architecture education for a long time. Of course in fields such as law, international relations, economics, physics or mathematics, the situation is different; there is more weight on tradition, on theory, and so on: more teaching, less learning. But we architects long ago learned something very near to this new paradigm that we are talking about, in the sense of pedagogical process.

The second thing Domincos Tavares asked us was whether we, within the family of architecture, could do anything with three-year basic training in architecture, and we answered "no": we have a Community Directive requiring five years, we have directives from the order of architects, and we have a long-standing 3 + 2 structure in the Portuguese polytechnics; and while the dream of the polytechnic is to be a university, we do not dream of being polytechnics. We want to remain with our five-year structure: not 3 + 2 but a single five-year programme.

We studied the evolution of the curriculum from the 60's, when Domingos and I and the other heads of schools were students; and we saw that the basic scientific side of architecture has always remained a part of the curriculum. There may be changes in some disciplines – the name, the materials, the content – but basically, we have a tradition of drawing, design project, construction technologies, and so on, as well as certain standard theoretical subjects like economics, law, geography and sociology. So the final draft decision that was communicated to the Minister was that architects want to remain with the single five-year programme plus one more for a Master's degree; so our proposal is 5+1.

You must understand that in Portugal we have a system of very comprehensive secondary studies. Students come to the university from all possible areas, which means that some have never studied history, for example, and some cannot draw, and so on; and we feel that the first two to four years are a very important preparatory period, which helps the students to acclimatize and adapt to an architectural way of thinking. This, then, is the position that the President of the Commission communicated to the Minister.

I forgot to mention earlier that, when the discussion about Bologna started in Portugal, a letter was circulated from Lisbon, from the directors, saying that architecture and medicine would be excepted from the Process, as indeed they have been. All these processes are being concluded now, and by November the Ministers will have informed us, the basic agencies, of the basic requirements of the architecture curriculum that will have to be accommodated. After that we will have nine months to adapt. In other words, we have a timeframe, we have a methodology involving all the schools in Portugal, and we have conclusions. Thank you very much.

Per Olaf Fjeld, Oslo, Norway

Thank you very much. The panel closes this session. Thank you for an interesting discussion. It has not necessarily been easy, and it is certainly clear that there is a big variation in the decisions here; but at the same time we have gained a strong awareness of where we are going and how things will develop. Thank you very much

Chapter 3

Learning Outcomes and Competences Related to the Research in Architecture

Research is one of the main pillars of the European Higher Education Area. Research is not only developed into the framework of postgraduate studies but increasingly becomes, through different forms and practices, part of the undergraduate curricula. Which are the desired learning outcomes and competences including skills, abilities, knowledge and content of the profile of the academic researcher in architecture? What is this academic profile? How can the above competences be 'translated' into contents of the undergraduate curriculum (topics to be covered) and into structure of this curriculum (modules and credits)? What are the strategies and objectives for such a translation? Which priorities, which ethics of the learning outcome? Which approaches to teaching and learning are appropriate to ensure those learning outcomes and competences (types of teaching methods, techniques and formats)? Which methods of assessment can we apply to evaluate the achievement of those competences (when required, which kind of teaching material must be produced)? Which educational units and activities must be created to achieve the defined learning outcomes?

Interventions of Session 3

Panel

Lorraine Farrelly, Portsmouth, United Kingdom

Elzbieta Leszczynska Trocka, Wroclaw, Poland

Rainer Mahlamaki, Oulu, Finland

Selahattin Önür, Ankara, Turkey

Françoise Schatz, Nancy, France

Leen Van Duin, Delft, The Netherlands

Chair

Kees Doevendans, Eindhoven, The Netherlands

Questions for Session 3: "Learning Outcomes and Competences Related to the Research in Architecture"

Question 1 (5 minutes)

Does your school claim to educate researchers? If yes, in what way does your new school curriculum do this?

Question 2 (5 minutes)

What are the five fundamental competences and skills that your new school curriculum ensures to your graduate in order to enable them to be researchers?

For your help we propose to you to use the following (open ended) list

1. Awareness of the ongoing nature of architectural research and debate
2. Critical awareness of the relationship between current architectural discourse and practice and the architecture of the past
3. Awareness of the highest standards of achievement in architecture, in design, in built work and in scholarship
4. Awareness of the moral and ethical issues of investigation and the need for professional codes of conduct in research (eg. appropriate acknowledgements of contributions, etc.)
5. Ability to define research topics which will contribute to knowledge and debate within architecture
6. Ability to formulate research questions
7. Ability to identify and use paradigms, theories concepts and methods of enquiry appropriate to the discipline and the topic of enquiry
8. Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)
9. Ability to prepare, process, interpret and present data using appropriate qualitative and quantitative techniques
10. Ability to work with a high degree of autonomy (eg. Accept responsibility for research project planning)
11. Ability to communicate appropriately in written, oral and graphic forms
12. Awareness of and ability to use appropriate tools of other human and physical sciences (eg. Literary criticism, art history, philosophy, studies in constructional analysis, etc.)
13. Ability to use IT and Internet resources (statistical, cartographical methods, database creation, etc.)
14. Ability to collect and integrate several lines of evidence to formulate and test hypotheses
15. Ability to plan, conduct and report on investigations

16. Ability to write in one's own language, using correctly the various types of architectural literature
17. Ability to reference sources accurately and appropriately
18. Ability to evaluate evidence and draw appropriate conclusions
19. Other...

Question 3

How does your new school curriculum ensure these competences and skills in terms of:

- Related subject areas (what subject areas can ensure these five characteristics of the profile of researcher)
- Positioning, timing and weight in the structure of the curriculum (in which years of studies are the five characteristics ensured, in what relation with other subjects, and what is the importance of these subject related areas compared to other subjects in the overall school curriculum).

Schools' Engagement in research

Kees DOEVEDANS

Technical University of Eindhoven, Faculty of Architecture, Eindhoven, The Netherlands

Introduction

The questionnaire of which I will present you the results was not focused on competences and did not include a list of competences, but on school engagement in research. Then we will have contributions from the members of the panel who were asked to reflect upon and to answer the questions that are on the paper in your package. Contributions will be made by the University of Technology of Delft, the School of Architecture of Nancy, the School of Architecture of Portsmouth and the School of Architecture of Oulu, and also from the Universities of Wroclaw, Poland and Ankara, Turkey, so you see we cover quite a geographical spread. These people will be asked to speak for about 5 -10 minutes on the questions that are on the paper, and unlike yesterday we want them to deal with all three questions in one intervention and to conclude with some kind of statement. Then we will begin the debate, which we are calling a workshop to imply that you are expected to do some work. After that we will try to see whether we can make a first selection of competences through a process of hand-raising and voting, which I hope will work. At the end I hope that Loughlin will assist me in doing the counting and then, hopefully, we will give you the results of the jury, and conclude the session. So this is what we have in mind, and I hope it works.

I will begin with an introduction to this session. In Hania 2003, the curriculum group report concluded that "the Meeting of Heads of Schools is not yet in a position to engage in fruitful discussion about the place of research in the architectural curriculum", and that "at present we are simply aware of the variety of situations regarding research and the fact that a variety of research paradigms are being utilized". Then, at the meeting in Antwerp in February, the main object of the working group on research was to clarify what we mean by research. This resulted in the questionnaire I showed you, which has been circulated. We had 26 responses to this questionnaire, and in a few minutes I will give you the results of this first set of answers, which will perhaps give you a rough idea of what we mean by research. The other questionnaire that was drawn up, the one that Constantin showed you, was focused on competences; it too has been sent around, and we are waiting for your answers. So this is the next stage, and we hope that this can be finalized very soon.

Speaking about research, a lot of us complain that it is difficult to do research in architecture, but James Horan spoke about all the events of the EAAE and there are so many conferences that I think we are entitled to be very optimistic about it. There was, for instance, the European Conference on Research in Architecture and Urban Design, in May, in Marseille, with 250 participants from 23 countries. I read in the newsheet that the conference dealt with the strength and the quality of architectural research and debate, but there was also an observation from the United States, that the American model is trying to drive through a hierarchy between a super-academic doctorate and a sub-professional doctorate or design doctorate. The expectation is that there will be

a unique PhD that can include design, creating something between a super-academic doctorate and a sub-professional doctorate. Then there was the conference in Dublin, in June, entitled *Between Research and Practice*, which attracted over 100 participants who presented 40 review papers. In October, there will be the conference in Delft on *The European City*, which also includes a unit on research by design. In April, there is the conference *The Unthinkable Doctorate*, and one of the questions is whether the PhD design in architecture is possible. In May, in Leuven, there will be a very theoretical conference on public space, organized by Leuven in co-operation with Eindhoven. So there are many, many scientific events. And then I was asked if I could also direct you towards a new possibility, that of becoming a scientific publisher. There is to be a new magazine and Urs Hirschberg already told us something about it very briefly. This is obviously a very good magazine.

One of the items on the agenda for this session and this meeting is learning outcomes; and I think that in the case of research we have to ask ourselves who we want to teach. For in research we do not only teach students, whether graduates or undergraduates – although perhaps in teaching research we can limit ourselves to graduate students. Research should also lead to learning outcomes for ourselves, for staff members, and also for society, because research has to lead to new knowledge. So I think it is important in the case of research to distinguish between at least three target groups: graduate students, staff members and researchers, and also society in general, including the profession.

This point was also made by the speaker from the Thematic Networks, who stressed that society had to be included in all networks. We have to bear in mind, then, that research should also lead to learning outcomes for society. And in this last case, for instance, we might ask what we can contribute to the knowledge-based society and to a society with a greying population. This also means that in the case of research the learning outcomes will have different forms: competences for students, but also new knowledge insights for society and for researchers. And that also means that in the case of research scientific output, such as articles published in your peer review magazine, has to be considered as a learning outcome.

One final thing, before we start the presentations on the results of the research questionnaire, is that in the first keynote speech Professor Anderson made what seems to me a very interesting distinction between the profession and the discipline. The relation between the profession and discipline is a very difficult subject; we generally associate the profession with practice, but it also has a scientific side. This distinction leads, respectively, to two types of output: on the one hand, diagrams and models, and on the other, papers and articles. This is a distinction, I think, that could be of some importance in the areas of research and curriculum.

Results of Questionnaire on School Engagement in research

All schools are doing research

A first outcome is, that all schools indicate that research is carried out in their schools. This means, even the smaller schools are able to do research, and combine education and research.

Who carries out the research?

Schools indicate that most of the research is carried out by staff and students together (44.5%)

We do not exactly know what this means, for the students are in the questionnaire are not distinguished in bachelor, master of (post-)doctoral-students.

37% of the research is carried out by staff members only.

18,5 % of the research is carried out by students only. Also in this case, we do not know which students are meant. It is assumable that only graduate-students are meant.

Types of research

Four categories were distinguished:

- Investigation for studio projects leading to a design outcome
- Research by design leading to optimal solutions
- Supervised structured enquiry leading to a thesis of dissertation
- Investigation commissioned by sponsor

Although all categories have almost the same score (resp. 21%, 20 %, 32 %, 27 %), some remarks can be made:

The main category of research has a thesis of dissertation as its outcome. This could refer to scientific research.

'Investigations leading to a design outcome', and 'Research by design leading to optimal solutions' make 41 % of the total research. Probably we have to distinguish this from the 'scientific research', and consider this to be a kind of practical design research, 'applied research', or 'professional research'?

The fourth category is based on the financial aspect, and could in principle overlap with the other categories.

If we leave this category out, we have the following results:

- Investigation for studio projects leading to a design outcome, 29 %
- Research by design leading to optimal solutions, 27 %
- Supervised structured enquiry leading to a thesis of dissertation, 46 %

Most of the research carried out leads to a thesis or dissertation!

At what level in the curriculum is research carried out?

The largest part of the research is carried out on the level of doctoral and post-doctoral. If we take these levels together: 61 % of the research.

Only 10 % is carried out on the Bachelor-level.

Taking in account the Bologna-system of Undergraduate (Bachelor) and Graduate (Master –Doctoral): 90 % of the research in the curriculum is carried out in the (Post)-Graduate-stage.

Specialised Research Groups

Specialized research groups seem to be of great importance: 80% of the research is executed by this type of groups.

Organisation

However, if we ask how research is organised, schools indicate that only 30% is organised by Specialised Research groups. The main category of research (34 %) is organised in an 'Individual-one-to-one supervision'.

36 % of the research is organised as studio work, individual or in groups

Teaching of research methods

Schools indicate that 84 % have the teaching of research methods as part of the curriculum, especially on the (Post-)Graduate level: 92%. Does this indeed mean that students are hardly confronted with research methods in the bachelor stage?

It is also notable that 'Qualitative methods' of research are dominating the 'Quantitative methods', resp. 55, 5 % and 45.5%

Completion of Graduate research

In the graduate stage most of the research degree are completed with a Major thesis or dissertation: 72 %, against 28 % with a minor thesis or examination.

Of course, there is some difference at the master and doctoral stage. In the doctoral stage 80 % of the students complete their degree with a major thesis, in the master stage 61 % of the students.

Financing of the research

For the financing of research will always be done by means of a mixture of funding sources.

We distinguished:

- Schools own resources, 18 %
- Project sponsorship, 18 %
- Commissioned Research, 64 %

The category 'Commissioned Research' was further distinguished as follows:

- By appointment, private report: 13 %
- By appointment, public report: 18 %
- By national/regional/local competition: 18 %
- By international competition, eg. EU 6th Framework: 15%

This financing of the research carried out at architectural schools should still be focussed on. Is it really true that 15 % of the research is financed by 6th Framework of EU? This is unbelievable!

Output of research

Respondents could tick the following categories:

- Externally-sponsored exhibitions/catalogues or externally published projects 11 %
- Peer-reviewed papers (international journals): 14.5%
- Peer-reviewed papers (international conferences) 15.5 %
- Peer reviewed papers (national journals): 12 %
- Peer-reviewed papers (national conferences): 14 %
- Books: 17 %
- Published Research reports: 18 %.

This is no information on the types of produced output, we have just information on the recognition of types of output.

Many schools should be very happy, that most of the types of papers are recognised as research output. If we have to meet scientific standards only the category of peer-reviewed papers in international journals will be recognised. Of course the category 'dissertations' on the doctoral level is missing, and should be added.

Support of the research

Respondents indicate, that most schools offer support for research, 88 %.

The type of support is as follows:

- Financial support: 18 %
- Special awards for research-active staff: 15.5 %
- Share of research overheads for responsible staff: 13 %
- Administrative support for research bids: 15.5 %
- Structured leave of absence for research-active staff: 10 %
- Specialised equipment: 18 %
- Specialised technical support staff: 7 %

38.5 % of the support consists of incentives for research staff (awards, leave, shares of overhead).

Assessment

Finally we asked how research is evaluated by research assessments. 84 % of the schools indicate that assessments are carried out, mostly by National Assessment Committees, namely 57 %. The other types of assessment are by peer reviews, international as well as international, both of them score 21,5 %.

Evaluation / findings

In Master and Doctoral- phase: Thesis or dissertation must be the outcome

In Bachelor-phase: no research, there is almost no education in research, never optional. How do we introduce research into the bachelor or undergraduate stage?

Specialised research groups: Thesis and dissertation must fit into the framework of the

fields of specialised research groups. Master- and doctoral-students function as members of these research groups.

Output-categories: a distinction between professional and scientific output is necessary. Scientific output has to be restricted to refereed articles in international magazines and dissertations. Another type of research is applied research..

It is necessary to distinguish between types of competences, for instance:

- Competences Research & Design
- Competences Doing Research

Issues for discussion

Some of the points we could discuss here are: What are the competences for research and design in the graduate curriculum in studio work and in-course research methods, and the competences for scientific research, as specialized competences optional in the postgraduate phase? Do we agree that a major thesis or dissertation is the outcome of research and design, plus scientific research? Are research-driven education, research-led teaching and research by design worthwhile approaches, or are they just concepts to mask a problem in the relationship between education and research? And, finally, can we specify research competences? It was in order to do this that we had this questionnaire sent to you; and we will now ask the representatives that are here to make contributions on this topic by answering the following questions: Firstly, does your school claim to educate researchers and, if so, how does your new school curriculum do this? Secondly, what are the five fundamental competences and skills that your new school curriculum ensures your graduates in order to enable them to be researchers? And finally, how does your new school curriculum ensure these competences and skills in terms of related subject areas, positioning, timing and weight in the structure of the curriculum? Well, these were the questions that were addressed to the panel members that will now take their places behind this table. They will not give detailed answers, but will just outline the position of their schools in terms of research and how it is carried out at their school and what specific forms they have developed to do so. I would now like to invite the members of the panel join me at the table, and then they can make their contributions.

Research in Architecture Curriculum at **Nancy** School of Architecture

Françoise SCHATZ

Nancy School of Architecture, France

We do educate research students in our school in Nancy, but it concerns only a very few students at the end of the cursus. Actually, since 68, research has been at the 'center' of a switch in teaching, a way of « escaping » from the Beaux-Arts traditional teaching approach. At that time we began to build relationships with universities and the so-called 'grandes écoles' and to set up research laboratories. Nowadays 50% of full time teachers are practioners, while researcher - teachers make up 50% of the other half, though there is no researcher - teacher status in French schools of architecture.

Ever since, and because of that, the theoretical aspect of knowledge has been of great importance in our curriculum even if our main objective is to produce practioners. That is why we have a tradition of written and orally tested dissertations, in various fields of investigation, based on '*using appropriate sources of relevant information*' etc. Since 98, due to the regulated curriculum of French schools of architecture, one part of a student's work has been a compulsory research-type dissertation both in the second and third cycles. We also continue to ask the students to do the « old » long dissertation supporting the 'statutory' final project ('small' thesis, case-studies, etc.).

Since 91, I think, we have had a special curriculum called Diplôme d'Etudes Approfondies in the 5th year which is a requisite – however insufficient, as we'll see later on – for doctorates, a path towards the 8 of the 3/5/8. During their 5th year of studies, students must choose two items from a list of 5 or 6 so-called seminars on different topics. One of these is the research-oriented DEA, called « Modélisations et Simulations des Espaces Bâtis ». An admissions' board selects between 15 and 20 candidates from around France (including a few from our school, usually 2 or 3) and from abroad, most of whom have been trained as architects or engineers.

Compulsory core modules and optional modules are followed by a 5-month internship in a research laboratory, which is the subject of a written report and a viva voce presentation. In addition to the necessary tools, knowledge and competences to be gained, the subjects range from the most applied approaches to the field of cognitive sciences, as the whole curriculum is aimed at finding out if a student is capable of doing research.

Then follows the very narrow path of the doctorate, very narrow because the architectural school of Nancy is part of a university structure called Institut National Polytechnique de Lorraine in which, if you want to carry on to the 8th year, that is, if at the end of the 5th year, having passed your DEA with excellent marks and an admissions board, you are interested in research and want to obtain a doctorate in « sciences de l'architecture », you absolutely need a scholarship for the whole of the next 3 years. And that means a lot of money ! And above all scholarships are scarce : we can only get one per year - or less than one a year - through the INPL, and the spring should dry up next year. So we have to find other means to get interesting and interested students up to a doctorate. It is very difficult to

find scholarships because, as we come under the Ministère de la Culture and not the Ministère de l'Education Nationale, we are out of the university system.

That's the first issue I wanted to stress, the lack of scholarships i.e. of money. The second point concerns the content of the doctorate thesis : in my view and in that of all the researcher- teachers in my school and many from other French schools, a project in itself cannot be a doctorate ; scientific research has nothing to do with the 'search' for a project on a drawing board. This does not mean that projects and designs – or design- cannot be used as subjects of, or cannot be the focus of, investigation from any constructed point of view, but, as I said before, the result of a 3 year thesis cannot be a project.

Kees Doevendans, Eindhoven, The Netherlands

You said a scholarship from their own country: does this mean that there are a lot of students from abroad?

Françoise Schatz, Nancy, France

We have approximately 50 students at the DEA, and roughly half of these are foreign students.

Kees Doevendans, Eindhoven, The Netherlands

You said it is a passport to a doctoral degree?

Françoise Schatz, Nancy, France

Yes.

Kees Doevendans, Eindhoven, The Netherlands

Do this mean that you have certain specific competences as selection criteria?

Françoise Schatz, Nancy, France

In my opinion, they are very generic competences, generic for research; for example, the writing of hypotheses or the finding of basic sources or the planning of research time, and so on. For me, these are generic research competences

Kees Doevendans, Eindhoven, The Netherlands

And you would distinguish this type of research competences from those required for research in design projects?

Françoise Schatz, Nancy, France

It depends. I don't think that a project can be research. You can do research on design, for example, one can researched on how architects think, and things like that; and while

these could certainly be topics for research, I don't believe that a research by project could be a Doctoral thesis.

Kees Doevendans, Eindhoven, The Netherlands

OK. Thank you for your presentation. I would like to limit the questions, but maybe, if there are only one or two, we could hear them now?

Christian Huetz, Regensburg, Germany

Françoise, I just have one question, how many students do you have altogether in the school?

Françoise Schatz, Nancy, France

600 students

Truus Ophuysen, Amsterdam, The Netherlands

Is that a general opinion in most or all French schools, or is there a variety of ideas about this?

Françoise Schatz, Nancy, France

No, I think it depends on the school and on the individual.

Kees Doevendans, Eindhoven, The Netherlands

OK. We will limit the questions to important informative questions. Thank you, Françoise, for your contribution. The next contribution is from the United Kingdom, from the Portsmouth University School of Architecture. Lorraine Farrelly is here: would you please tell us how you view the issue of research, how it is integrated into your school and how it is organized.

Research in Architecture Curriculum at **Portsmouth** School of Architecture

Lorraine FARRELLY

University of Portsmouth, School of Architecture, United Kingdom

1. Our School does Educate Architects to be Researchers

There is a connection back to the main area of undergraduate teaching in the school of architecture where there is a tradition for learning through Paradigm/case study.

The University also encourages the idea of Knowledge Transfer. This is a national education initiative to encourage partnership with business/practice at Masters level.

The main Intention at Portsmouth, is the Integration of architecture and research through teaching and where appropriate design projects into the curriculum.

We have three specific areas of research including landscape, environment and architecture, and urban design. There are real urban problems that students are using to generate ideas. It is the process of the urban design problem that is being considered and investigated, how to create large scale urban change in the city.

A Generic unit "Research Methodologies" exists within our faculty of environment and introduces general issues of research such as referencing, research and writing.

In the most formal sense this takes place in three units of the 4th year of studies on the post graduate/ masters course:

1.1 Architecture & Culture

A lecture based unit approximately 12 x 2 hour lectures

Invited speakers talk about different themes of architecture and culture:

Including : Film, Urbanism, Landscape

Assessed through student seminars run by students and a written report.

One of the intentions is to assist students to become familiar and proficient in the reading and production of academic texts – the language of research.

Texts are considered and compared in seminar.

1.2 Dissertation

In addition to being an opportunity to implement the lessons from (1) in a major piece of written work, this unit also introduces through lectures and/or workshops, the variety of approaches to research, and some of the methods.

References:

Director of research

- a) McCartney, K. (2001) Research Training for Designers: Diagrams & Conceptualisation, in Research by Design, Delft University Science, Delft, NL, p222-228.

- b) McCartney, K. (2004) Role of Diagrams in Research, presented to EURAU (European Research in Architecture & Urban Design), Luminy, Marseille, April 2004.

1.3 Architectural Technology

A fundamental function of this unit is to develop skills in using Case Studies as a research method, which is of particular value to architects and other designers. A different building is chosen each year, and students are required to work in small teams to gather and analyse both secondary and primary information about the design, construction and operation of a significant example of contemporary architecture. In order to facilitate peer group learning, the case studies are produced using a common template, inspired by the analysis of the contemporary workspace by our former Visiting Professor, Frank Duffy of DEGW, working together with the Building Research Establishment. This use of case studies focuses on specific areas such as environmental control or use of innovative materials and technology for comparison.

references:

Portsmouth School of Architecture web site: Student Information, Diploma 1, Unit 410 for briefs and examples of student work
www.port.ac.uk/architecture/studentinformation

2. Five Fundamental Competences:

reference to enumeration used in Questionnaire:

- 5 - Ability to define research topics
- 6 - Ability to formulate research questions
- 9 - Ability to prepare, process, interpret and present data ...
- 11 - Ability to communicate appropriately ...
- 17 - Ability to reference sources appropriately

3. How are the Five Fundamental Competences Achieved?

- | | |
|---|--|
| 5 - Ability to define research topics | tutorials & workshops
Dissertation (1.2 above) |
| 6 - Ability to formulate research questions: | tutorials & workshops
Dissertation (1.2 above) |
| 9 - Ability to prepare, process, interpret and present data | Template and examples
Architectural technology (1.3 above) |
| 11 - Ability to communicate appropriately | one-to-one tutorial feedback on student's own texts and web-based presentations by students to peer group
Dissertation / Architecture and culture/ Architectural technology (1.1/ 1.2/1.3 above) |
| 17 - Ability to reference sources appropriately | one-to-one tutorial feedback on student's own texts
Architecture and culture. (1.1above) |

Kees Doevendans, Eindhoven, The Netherlands

Thank you very much. Before we go on, I have one question. You spoke about case studies: do you think that research can be based on case studies? Because that has always been a matter for methodological debate, and many people believe that case studies are not scientific.

Lorraine Farrelly, Portsmouth, United Kingdom

I think that a case study can be a starting point to investigate and to understand. I don't think that it can be a complete area for research on its own.

Kees Doevendans, Eindhoven, The Netherlands

OK. If there are one or two informative questions we can hear them now; if not, we can go on to the third lady on the panel, Elzbieta Trocka, who is from the Technical University of Wroclaw, in Poland.

Research in Architecture Curriculum at **Wroclaw** School of Architecture

Elzbieta TROCKA - LESZCZYNSKA

Wroclaw Technical University, Faculty of Architecture, Poland

I would like to begin by presenting our school. It has twelve departments, one of which is the architecture department with 1700 students, and is a part of the University of Technology, which has a total of 35,000 students. We have a five-year programme of studies, leading to a Master's degree; we do not have a two-step programme, only a Master's degree. A few years ago we also instituted a four-year doctoral programme. Every year we hold a competition, which is open to Master's graduates from our and other schools and also to practicing architects and choose 30 students that have had some kind of practical experience, with research, with conferences, with publications. This means that the whole programme has almost 150 students. Every year we have five or six scholarships from our faculty and a few from the university, so that we have thirty scholarships for the entire doctoral programme. Sometimes we look for financial support from the Ministry of Science, and some students that have a sponsor or tutor can also receive special grants for research purposes. As a part of this PhD school, as you might call it, we have outside researchers as well as faculty members. There are researchers that are working towards a professorship, who are completing a book or some papers or publications or who attend conferences, and then there are researchers who are paid by the city and who are studying together with the professors and students, and in this

way we can start to show the students what research is and how it is done. In addition, as part of these research programmes we also have scientific groups, and we hold special scientific seminars where the faculty and the students from the Master's and doctoral programmes can discuss the results of various kinds of research projects. We also have research groups made up of professors that come together to do research in spatial planning, in monument conservation, in architecture and town planning, and in theory and history of architecture.

Kees Doevendans, Eindhoven, The Netherlands

The issue of this conference is competences, and I see you make a kind of selection: you referred to students that have attended conferences, had material published, and so on. That is similar to what Françoise said about some types of competences, like being adept in scientific communication and things like that. Is that a criterion for you?

Elzbieta Leszczynska Trocka, Wroclaw, Poland

Yes

Kees Doevendans, Eindhoven, The Netherlands

Thank you for your contribution. I see there is a question. Yes, please.

Heiner Krumlinde, Bochum, Germany

I'm not sure I understand what sort of research is being done in your school. We always hear the same basic topics talked about, whereas in Poland the focus seems to be on history, design history and conservation – I know you are masters at conservation in Poland. Can you give us an example of a specific research topic that you have done?

Elzbieta Leszczynska Trocka, Wroclaw, Poland

One example might be spatial planning. We have a lot of scientific problems in the area of spatial planning because it entails a lot of mathematics and a lot of communications problems, but from a scientific point of view, not only from the design side: there is a lot of theory as well. This is one problem. Another has to do with theory in architecture and the history of architecture, because we in Poland are somewhat specialized in the history of architecture. This is particularly true of our school, which is in southern Poland, in a very interesting district, so there are a lot of dissertations on topics such as history of architecture in relation to special cities, or to special kinds of architecture, or to special kinds of design, and so on.

Kees Doevendans, Eindhoven, The Netherlands

Thank you very much. If students are selected, for instance, for a subject on history of architecture would they be chosen from the field of architecture or art history?

Elzbieta Leszczynska Trocka, Wroclaw, Poland

We have a special time for choosing professors, since every professor at our school has his own topics.

Kees Doevendans, Eindhoven, The Netherlands

There are no research programmes, in other words, they are individually based.

Elzbieta Leszczynska Trocka, Wroclaw, Poland

Yes, and it is based on e-communication. Students visit the professors' web-sites and choose the field they are interested in, and then during the competition for study they can specify which particular topic they are interested in and with which professor, and over the four years it will become more specialized.

Kees Doevendans, Eindhoven, The Netherlands

This is a fairly student-oriented system?

Elzbieta Leszczynska Trocka, Wroclaw, Poland

Yes, from one aspect, but there is also research led by the professors, sometimes separately from the student.

Kees Doevendans, Eindhoven, The Netherlands

OK. Thank you. Our next speaker is Leen Van Duin, Head of the Architecture Department at the University of Technology in Delft. Leen, perhaps you could also mention research programmes.

Research in Architecture Curriculum at **Delft** School of Architecture

Leen VAN DUIN

Delft University of Technology, Faculty of Architecture, Delft, Netherlands

In the 1930s, the leading lights of the Modern Movement gathered on a cruise on the Mediterranean set down their common aims in the famed Charte d'Athènes. This utopian document, which would have far-reaching influence on the extension of European cities, would also mark one of the last attempts to formulate a comprehensive architectural programme. In the ensuing decades, architecture has been increasingly characterised by the absence of a programme. Due to the rise of the free market and the flexibilisation of professions, architects explored the limits of architecture and exceeded these, by drawing on current intellectual and artistic developments – from philosophy to video clips –, at times disregarding all conventions in a frenzy of total freedom.

The city as a configuration of spaces – streets, squares, parks – and buildings – residential neighbourhoods and public buildings – mutated into a disparate collection of buildings, explainable from a overwhelming commercialisation of architecture and the need for an easy reach of accessibility – a global network – but without an idea of the city as an architectural artefact.

The Faculty of Architecture of the Delft University of Technology developed in 2002 a research programme for a period of seven years.

One of the research programmes, 'Urban Architecture', proposes the city synonymous to architecture.. Description, analysis and composition of forms, structures and functions are seen as principles for reception and design of urban artefacts. Notions as typology and morphology are related to designs that are no longer indifferent, but spatial characterized by continuity, clarity and precision, and that are capable of being used for a variety of purposes.

In the period 2002-2008 the research is focussed on the architecture of the Dutch city. The need to explore the durable development of our cities is greater than ever. Such a research project should be included in Schools of Architecture, because only there students and professionals can work free from the pressure of the market, and search for a new role for the profession by moving with caution between historical knowledge and today's questions.

With a concept of a permanent architecture in a European tradition one could free architecture from a chaotic and rapidly changing society, as well as from any utopian visions. We think that vital architectural knowledge can not be invented, but has to be transmitted through practice, in concrete historical situations with specific demands. In the oncoming years, architectural Metamorphoses, Interventions and Transformations (MIT) of the city will be our domain. It is this approach we want to explore here in this conference, together with colleagues from abroad who are interested in a clear and self evident architecture of the city.

I want to stress the open an international character of our programme. Research in architecture and architectural design is nowadays all over Europe seen as extremely important. The council of the European Association for Architectural Education (EAAE) emphasizes the importance of research programmes in schools for architecture as much as they can:

1. of course to develop the discipline;
2. but also for the content of the curricula;
3. or to define one's position in the very different points of view within the discipline;
4. and last but not least, to explore the possibilities left to architecture as an autonomous discipline.

The aim of our programme on 'Urban Architecture' is:

- a. to contribute to the understanding and development of the European city, especially architectural projects in European cities;
- b. improvement of design methods. In Delft we explored till the sixties/seventies a severe functionalistic approach to design tasks. Under influence of the Italian morphological research we got interested in a more rationalistic approach, which we explored in so called plan analyses. We tried to link this type of studies to the debate on rationalism

in the eighties and nineties, and to continue this line in the programme 'Urban Architecture'.

- c. We do not believe in one overall theory. We see typological and morphological research as a way to discover the meaning and logic in architecture. But it takes time and effort to discover the mastery in the most ordinary things. We believe, within the continuity of the discipline, in the personal vision. Only through a free and virtuoso treatment of certain characters, one can come to satisfying, clear and bright designs.

In this light, we want to know under which conditions a design can be seen as scientific output. The Delft University of Technology recognizes a design as a doctorate if:

- x. It is accompanied by a written analysis that includes the various steps in the design process.
- y. It indicates a solution for a class of problems and generates new knowledge, or show how existing knowledge can be applied into new designs.
- z. It meets the formal standards as:
 - 1. relevance of the subject
 - 2. importance and definition of the problem
 - 3. originality of the approach
 - 4. the arrangement, analysis and processing of the material in relation to the quality of the design
 - 5. creativity in the field
 - 6. critical confrontation of the design with the state of the art
 - 7. balance, clarity and brightness of the design.

As I mentioned before, in our research programme we also laid down content-based principles for monitoring the quality of our MS-c programme, which expresses the view that the content of curricula must not be exclusively determined by the demands of professional practice, but, as well, by the innovative insights of research programmes at schools all over Europe. In this connection, the need to explore the possibilities left to architecture as an autonomous discipline is greater than ever before.

Kees Doevendans, Eindhoven, The Netherlands

That is, of course, important. This is also in the Berlin Declaration, which says that "Networks at Doctoral levels should be given support to stimulate the development of excellence and to become one of the hallmarks of the European Higher Education Area". So I think that perhaps you are saying that the EAAE could also provide support. Now, I have a question concerning your contribution: I understand that, in principle, there is no distinction between competences for research and design; competences for design are competences for research, and vice versa. Is that your opinion, then, that there are no specific research competences? You also emphasized that there is a research programme and a separate teaching programme. Of course, traditionally, in the faculties of chemistry and engineering, the research programme always was the education programme – there was no education as such: education was the spin-off of research.

Leen Van Duin, Delft, The Netherlands

This is something that I wanted to add, that in the Master's course the student does not choose his own project: this is decided by the staff. The staff have their own research programmes, and the students work within those programmes.

Kees Doevendans, Eindhoven, The Netherlands

The projects are taken from the research programme, so they are not entirely separate. Well, I am from the corresponding Department in Eindhoven and the situation is the same there. We have a research programme only at the Master's level at the moment, and we call it 'research-driven education' because, since under the Bologna system education is no longer funded at the Master's stage, there is only funding for research. Even the Director of Education now says: "Please, do not educate students, do research".

So, thank you, Leen, for your contribution. Before we continue, there is a question from Roger.

Roger Liberloo, Diepenbeek, Belgium

Do the other universities agree with your view that design is research – for instance, the University of Leuven?

Leen Van Duin, Delft, The Netherlands

I am just speaking for the University of Delft.

Roger Liberloo, Diepenbeek, Belgium

Yes, but have you discussed this with other universities?

Leen Van Duin, Delft, The Netherlands

Not yet. This is a task for the EAAE. My statement does not only relate to architecture, but also to the other technical disciplines at our university – we have aeronautical and civil engineering departments, for example – and all these faculties agree with what I have said.

Kees Doevendans, Eindhoven, The Netherlands

OK. So let us go on to our next speaker, Rainer Mahlamaki, Head of Department of Architecture of the University of Oulu, in Finland. Please proceed.

Research in Architecture Curriculum at **Oulu** School of Architecture

Rainer MAHLAMAKI

University of Oulu Department of Architecture, Oulu, Finland

Good afternoon and greetings from the northernmost school of architecture in the world! To begin with, I have to say that we do not have a finished programme or profile in research or studies in our school today, but this process is going on at present and I hope I can take some wise suggestions back with me when I return. In my opinion, research in architecture today should be considered from three different angles. Firstly, the history of research is very short, at least in Finland, and is concentrated on the research of the past. This means that we have books or research on topics such as the meaning of the Dutch Art Nouveau to the Finnish architecture or how the locality and the international intertwine in architecture – every country has its own examples. Typically, topics are the idea of a single researcher, or in this case, of a single architect, and the results are books or doctoral theses aimed mainly at professors, and secondarily at people who are interested in art. So, typically, in this kind of research the researcher is like a modern day translator of history and, in my opinion, we still need this kind of research today and in the future as well. Secondly, we need theoretical studies that gives material for Bachelor's and Master's level education, like science, environment, sociology, science of human behavior, theory of planning, etc., and this type of research should be organized and directed, and the results also, books and doctoral theses, should be directed primarily towards education. Thirdly, I would like to say that the newest area today is clearly the results achieved by outside funding or, in other words, commissioned research, which is focused on immediate benefit. The results could be a written presentation, or a building, or an industrial product – in our school, industrial design is a part of education on both Bachelor's and Master's level. We already have quite interesting examples in the area of Oulu; we have concentrated on wooden or timber architecture and today we have a group of about ten researchers and teachers and we try to create some kind of bridge between design and research, and this, on our scale, is almost revolutionary. We have concentrated mostly on wooden housing, but we also have one interesting example of a small wooden church. However, the important thing is that besides the design we can finish the doctoral thesis, theoretical documents, so in a way it is a combination of theory and practical design.

Kees Doevendans, Eindhoven, The Netherlands

What do you mean by the doctoral thesis? Is that at the end of the Doctoral stage, in the eighth year?

Rainer Mahlamaki, Oulu, Finland

Yes.

Research in Architecture Curriculum at **Ankara** School of Architecture

Selahattin ÖNÜR

Middle East Technical University , Department of Architecture, Ankara, Turkey

Prologue

Higher education in Turkey is already two-cycle (bachelor's and master's) plus the PhD level. The difference from EHEA (European Higher Education Area), in this respect, is that the first cycle is four years. Thus, while it has taken steps to implement the adjustments (e.g., for ECTS, diploma supplement, and assessment) regarding the EHEA, the Turkish Higher Educational Council appears not to have been satisfied with a three-year bachelor's cycle for the undergraduate education in the universities and wants to continue with the four year.

At present, architectural schools in Turkey, after four years of the undergraduate study, give a professional bachelor's degree which authorizes the graduate as an architect with all the rights issued thereunto. There is also no required internship period upon graduation. This existing situation is not in keeping with the criteria and proposals of the EAEA (European Architectural Education Area, - the "Chania Statement"). Recently a process for necessary changes to be made in architectural education has started, as a consequence of the European Council directive (07.03.2002/0061 - COD -) regarding the recognition of professional qualifications necessitated for the free mobility of professional services in EU and affiliated countries. The draft prepared for these changes proposes (4+2) (bachelor's and master's cycles) whereby the bachelor's will no more be a professional degree; thus, the duration of education for the title of architect will amount to six years, except the two-year internship that will also be demanded. The present master's programs other than the architectural design (e.g., restoration and conservation, architectural history, building science) will continue with new ones added to be accessible after the bachelor's.

Question 1: Does your school claim to educate researchers? If yes, in what way does your new school curriculum do this?

METU on the whole claims to reinforce its status as an international research university:

- More emphasis has been given to the already existing master's and Ph.D programs. Through these programs METU has also undertaken a role of educating young researchers for academic careers in new universities in Turkey.
- Curricula and each specific course in all the cycles (undergraduate, master's, and Ph.D) emphasize and encourage the development of research mindedness and learning to learn.
- Relatedness and continuity between all the three cycles (bachelor's, master's and Ph.D) have been facilitated.
- Master's and Ph.D theses studies can be formulated and run by the student under the

supervision of the advisor/tutor as a "Scientific Research Project" which, in that case, is funded by the University.

- Graduate options are encouraged to be established in the existing programs by staff who have related areas of specialization. Research projects and networking can help develop the research dimension in these options.
- A center for research, design, planning, and implementation has recently been established in the Faculty of Architecture. It is expected to function in generically defined areas in specific units of this center ("product design and identity", "Anatolian settlements", "materials conservation and laboratory", "universal design", "design and information technologies", "steel structures", "regional and urban research", "design", and "urban design"). The development of research units in this center is expected to reinforce research based education, especially in the graduate programs.
- C.I.B. Student Chapter has been founded upon approval by the C.I.B. Board in September, 2004. One main intention is for students to have access to worldwide networks and knowledge related with their research interests.
- During the 3rd and 4th years in the bachelor's program there are ten elective courses. Students are expected to choose at least one from each area of: "technology"; "environmental control"; "design and representation"; "architectural history"; "urban and city planning". The other five courses can be focused on any area that the student may be thinking of as a future area of study and research.

Question 2: What are the five fundamental competences and skills that your new school curriculum ensures to your graduate in order to enable them to be researchers?

From the given list:

- 1) Awareness of the ongoing nature of architectural research and debate
- 4) Awareness of the moral and ethical issues of investigation and the need for professional codes of conduct in research (e.g. appropriate acknowledgements of contributions, etc.)
- 5) Ability to define research topics which will contribute to knowledge and debate within architecture
- 8) Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)
- 15) Ability to plan, conduct and report on investigations

Question 3: How does your school curriculum ensure these competences and skills...?

"Undergraduate Program" / related subject areas:

1st Year: "Design"; "Introduction to Architecture"; "Graphic Communication"

- 4) Awareness of the moral and ethical issues of investigation and the need for professional codes of conduct in research (e.g. appropriate acknowledgements of contributions, etc.)
- 8) Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)

15) Ability to plan, conduct and report on investigations

2nd Year: *"Architectural Design"; "Landscape Design"*

- 1) Awareness of the ongoing nature of architectural research and debate
- 8) Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)
- 15) Ability to plan, conduct and report on investigations

3rd Year: *"Architectural Design"; "Principles of City Planning and Urban Design"*

- 1) Awareness of the ongoing nature of architectural research and debate
- 8) Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)
- 15) Ability to plan, conduct and report on investigations

4th Year: *"Architectural Design"; "Professional Practice"*

- 1) Awareness of the ongoing nature of architectural research and debate
- 4) Awareness of the moral and ethical issues of investigation and the need for professional codes of conduct in research (e.g. appropriate acknowledgements of contributions, etc.)
- 8) Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)
- 15) Ability to plan, conduct and report on investigations

"Master's Programs" and related subject areas:

(Architectural Design: "Introduction to Architectural Research";
 (Building Science: "Building Science Workshop")
 (Restoration and Conservation: "Sources and Methods of Research in Restoration")
 (History of Architecture: "Research Methods")

- 1) Awareness of the ongoing nature of architectural research and debate
- 4) Awareness of the moral and ethical issues of investigation and the need for professional codes of conduct in research (e.g. appropriate acknowledgements of contributions, etc.)
- 5) Ability to define research topics which will contribute to knowledge and debate within architecture
- 8) Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)
- 15) Ability to plan, conduct and report on investigations

"Ph.D Programs" and related subject areas:

(Architectural Design: "Architectural Research I-II")
 (Building Science: "Architectural Research I")
 (Restoration and Conservation: "Architectural Research I")
 (History of Architecture: "Research in Architectural History")

- 1) Awareness of the ongoing nature of architectural research and debate

- 4) Awareness of the moral and ethical issues of investigation and the need for professional codes of conduct in research (e.g. appropriate acknowledgements of contributions, etc.)
- 5) Ability to define research topics which will contribute to knowledge and debate within architecture
- 8) Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)
- 15) Ability to plan, conduct and report on investigations

There are in the Architectural Design Graduate Programs several theoretical and design elective courses that are important in terms of learning outcomes and competences related to research:

- Advanced Themes in Architecture and Urban Design
- Advanced Architectural Design Research
- Advanced Topics in Digital Constructivism
- Housing Research and Design Studio

In the Bachelor's Program there is the "Digital Design Studio", which is a design research studio intentionally started at that level, but will continue into the graduate levels.

Kees Doevendans, Eindhoven, The Netherlands

Thank you very much. You have given an exemplary presentation. Are there any questions from the audience? Yes, Roger.

Roger Liberloo, Diepenbeek, Belgium

How many students are there and how many researchers?

Selahattin Önür, Ankara, Turkey

Altogether the department has about 550 students: around 310 undergraduates, 165 Master's students, of whom 88 are architecture students, and 52 Doctoral students. Of course the Master's and doctoral theses and dissertations constitute the major research areas and research activities. The research is still mostly student-centered, but we academics are, both generally and individually, opting for more of a group kind of research to be instituted and promoted. For the moment, however, the research work is more open and individual, with publications and so forth, which are also encouraged.

Kees Doevendans, Eindhoven, The Netherlands

Thank you very much. I see that there are no more questions from the floor, but I do have something for the panel to think about: if we decide to create a doctoral network of staff co-operation, which of the other panelists could you work with best? Which system do you feel more comfortable with?

To turn to the debate, it is clear that one of the main themes for discussion is the relation of research and design; and I think that we should try to see whether we have to distinguish between certain competences related to design and science on the one hand and research on the other hand, or whether this is not necessary. Thank you.

Discussion

Coordination by

Kees Doevendans, Eindhoven, The Netherlands

Kees Doevendans, Eindhoven, The Netherlands

Members of the panel, I think we should start the debate now. The idea is that we have a debate for 20 minutes or so, and then, before closing this session, we can do the competence exercise I proposed. And there will be a keynote lecture later this evening. We have heard the presentations from the schools, and I think that some important issues were raised: funding was a recurring issue, as was the system – that is, the place of different competences and research focuses in the system. I think we do not need to discuss this item here this afternoon, because it has already discussed at great length. Nor should we talk about funding, because I know that you do enough of that at home, what with budget cuts, financial cuts, and so on.

Leen Van Duin mentioned that we need more information about content; and I think that, although we can also discuss system and all kinds of other things, we need more information on content – the themes and subjects of dissertations. This is something that could perhaps be included in the EAAE database. We can find out what the subjects of theses and dissertations at various stages are, and maybe pass this on to the board of the EAAE. Another issue that came up was case studies and project-based research, and I think that the question of whether case studies and projects can form a basis for scientific research is another subject we should discuss. There is also the notion that Leen Van Duin introduced, that research and design are closely related. I am not sure, Leen, whether you are talking about teaching or design or research, since you touch on all three. In my school, for example, there are clearly distinguished learning target areas, and designing is one type of competence and doing science is another and doing research is a third, and they are not mixed. Of course you can combine them, but they are separate learning target areas, separate competences.

So this is one of the questions I have after these presentations, but it is not up to me to decide what you want to talk about: it is up to you. Perhaps you have some questions, and then we can debate those issues. Is there someone who wants to start the discussion? Pierre Von Meiss will speak first.

Pierre Von Meiss, Lausanne, Switzerland

Well, we received the questionnaires about research, but the problem is that we get a questionnaire every six weeks or so, and not only from this institution. In Constantin's questionnaire, these areas of research are touched upon very clearly, but then again it leads only to statistics and not to ideas. The statistics you showed were quite similar, in terms of the fact that they show that you know how much of what is going on where. Then we have these presentations where everybody starts to talk about what is going on in his school, and that could go on for days.

In order to start moving ahead I would like to make a suggestion. In Constantin's questionnaire a distinction was made between what was going on at the Bachelor's, Master's and Doctoral levels. Why could we not agree, among schools, on some minimum requirements in the area of research for each level? This does not mean homogenization: it simply means guaranteeing some basic levels of research education. So, for example, I would say that at the Bachelor's level every student should be able at least to make a state-of-the-art study. I will explain later what I mean by this, because I believe that it is really the prerequisite to any research. There is no point in repeating research that has already been done. At the Master's level, while I don't think that we are really going to train researchers, it could perhaps be a minimum requirement in all schools that anyone who has studied architecture at that level should be able to formulate a research hypothesis very clearly. And then, for the PhD, he would have to work on that hypothesis. If you will allow me to tell you a story, I will give you an example of what I mean by a state-of-the-art study. When I started teaching in the United States, they asked me to teach graduate students how to go about research, and I had to admit that I didn't know, since I had never done any. So they got a scientist from the National Science Foundation to come up for one week. (He was not an architect.) He gave us some statistics on the size of the average American from 1860 to 1970, made a projection that showed that by 2040 the average American would be close to 3 meters tall, and told us to make a state-of-the-art study, saying that before you research a topic you have to find out what and how much is known about it. So we asked around, and no one could tell us anything, until finally at the end of the week we found that the only place where we could get any information was at the Pentagon, which had encountered a similar problem in 1951, when all the uniforms for the Korean War proved to be too small for the new generation of soldiers that was coming in. And since this was during the Cold War and they had to be ready at all times, they had therefore done this research. So I repeat, it is absolutely fundamental to know how to make a state-of-the-art study, and I think that this should be taught at the Bachelor's level. Thank you. I am sorry if I have taken up too much of your time with this story.

Kees Doevendans, Eindhoven, The Netherlands

No, no. Thank you for this story. Of course it is interesting to have concrete examples of how we do research. I agree with you, but I think that the idea is that competences could be a kind of first step to making things more concrete. But I agree that figures are not the most interesting part, although they do give some kind of idea of what we are talking about and of different conceptions. So, thank you again for this story.

Loughlin Kealy, Dublin, Ireland

I have two questions for Professor Françoise Schatz. The first is a very simple question: of the 600 students she said they had, how many are research students?

Françoise Schatz, Nancy, France

3 or 4.

Loughlin Kealy, Dublin, Ireland

OK. Thank you. The other question, which is slightly more difficult, is that I think you said, almost in the same sentence at the beginning of your remarks, that research was almost an escape from the beaux arts...

Françoise Schatz, Nancy, France

No, I didn't say that. What I said was that before 1968 there was a tradition of beaux arts teaching by osmosis: you know, when you worked in a studio together with the other students and from time to time a teacher came by and said that your work was good or not good, and that was all. So you learned by a kind of osmosis, without knowing exactly what or how you were learning: you simply had things explained to you or shown to you. After 1968, you had to do research to prepare subjects for courses, to construct lectures, and so on. That is why I said that research was the way of escaping the traditional beaux arts teaching, because as a teacher you need research to build a core so that you have a solid foundation for your teaching. It does not mean that we don't teach within the studio as well.

Kees Doevendans, Eindhoven, The Netherlands

OK. Somebody wants to enter the debate. Could you also mention your name please?

Eric Monin, Villeneuve d'Ascq, France

I am from the School of Architecture in Lille. I am a little bit upset because nobody has mentioned the role researchers play in schools, and especially in changing things in schools. We only discussed how schools should educate researchers, but we forgot to mention that researchers are people who generally work in networks and that sometimes schools can change and evolve thanks to the actions of researchers.

Kees Doevendans, Eindhoven, The Netherlands

What do you mean by networks?

Eric Monin, Villeneuve d'Ascq, France

I used the word networks to suggest how researchers work, publish, meet one another at conferences. This is a good way to meet people who are thinking or working on the same subject and to create strong relationships.

Kees Doevendans, Eindhoven, The Netherlands

Yes, I agree. You mean the usual scientific communication circuit, with conferences, and this kind of thing. Are there network conferences for research by design? Yes? Are you sure?

Eric Monin, Villeneuve d'Ascq, France

I am sure.

Leen Van Duin, Delft, The Netherlands

I have a question. One of the remarks I made, and you may or may not agree with this, is that there is a difference between universities, where you have to produce new knowledge by research (at least this is the case in Holland, but I think it is the same all over the world), and academies, or Fachhochschule, where the goal is simply to produce architects. And if the main focus is on producing architects, the question arises as to whether research is necessary in that type of school. I speak now of the difference in Germany between the Fachhochschule and the universities. You are from a Fachhochschule?

Heiner Krumlinde, Bochum, Germany

Yes, I am a professor at a Fachhochschule, a second-class university, if you like, in Germany. I want to speak of one aspect of research, which can be introduced even at the undergraduate level. I have considerable experience of international workshops, having done 20 or so of them. When German students, for instance, go to another country, to a specific region with its own specific problems, perhaps caused by a decline in industry, and see problem areas in the cities, perhaps along the waterfront, and work with other students in international groups, they become curious. And they are curious about the meaning of the particular region, its circumstances and its history. And the results of these initial acts of research may be unknown in the city itself, because the people who live there do not see these problems. So this may be one answer to the problem – and for me it is a problem – of how a school that has never had any experience of research can begin to approach this sphere of activity.

Kees Doevendans, Eindhoven, The Netherlands

Does anyone want to respond to this idea of research? Is this the beginning of research?

Joaquim Braizinha, Lisbon, Portugal

I would like to make a point about the recent evolution of the notion of research. Throughout my entire life in the university, research and teaching were two separate activities. Research was done in research institutes, and teaching was done in the universities. Recently, however, the two have become mixed. I think that what we have always done during our life in the university – preparing lessons to teach to the undergraduate students, teaching Master's, teaching PhD's, sitting on juries for Master's and PhD's, and so on, can certainly be called research. Our life in the universities is research, all the more so since in Portugal, for instance, teachers at public universities work 36 hours a week, of which 12 are for teaching, 12 are for research and 12 are for doing certain various other kinds of work for the school.

So, my question is, how is preparing lessons, supervising theses, teaching Master's and teaching PhD's different to researching?

Kees Doevendans, Eindhoven, The Netherlands

I see. But if this is your interpretation of research, what do you think of the idea expressed by your neighbour that you have to be part of a network, that you have to visit conferences

and present research results at conferences? Yes, you can say that we always do research in the university and in the studio, as you said; but surely by definition a researcher has to be part of a circuit, a communications circuit, a scientific circuit?

Joaquim Braizinha, Lisbon, Portugal

I think that this is the second part of the notion of research – it is applied research.

Kees Doevendans, Eindhoven, The Netherlands

No, it is the first.

Joaquim Braizinha, Lisbon, Portugal

It is applied research, it is a different thing.

Kees Doevendans, Eindhoven, The Netherlands

OK. Christos?

Christos Hadjichristos, Nicosia, Republic of Cyprus

When I hear all this use of the word research, like you, I am confused. I guess what we need to do first is to decide what research means to us, as architects. For us it means scientific research; and this is like a club, with very specific rules, and with a number of different disciplines and different areas of activity, and whose members, over the years, have managed through networking, through sharing, through trial and error, to find a way to communicate what they mean by what they do. So I believe that by either identifying ourselves totally with a very generic term like scientific research – architecture is scientific research – or by saying that design is research or teaching is research, we are missing an opportunity. I believe we need to find our own identity as researchers, and specifically as architects, and not by going to either extreme.

Kees Doevendans, Eindhoven, The Netherlands

This is one view, certainly. If you have a standard metre you can always make it one centimetre shorter.

Leen Van Duin, Delft, The Netherlands

I have a question for the audience. Imagine that in your school there are no students, but you do have your research programmes. What happens to your work then? Can you survive as an institution only by doing research? Can you make your contribution to society, to the profession and to the discipline, solely as researchers, without any students? And can you fulfil your research programme without any students? Because if you can, then what you are doing is research. My question is: if there were no students, what would your research be?

Joaquim Braizinha, Lisbon, Portugal

There would be no schools, no results. There would be nothing.

Leen Van Duin, Delft, The Netherlands

Yes, but there are research institutes where you can do research, and where there aren't any students to bother you and where you don't have to go to the studio. I will give you the example of a department in my university – I think it is the faculty of natural sciences – where all the professors (and there are 30 or 40 of them) are proud to have zero students in their faculty, because then they can put all their effort into doing research, to develop the discipline. And they do not want students.

Joaquim Braizinha, Lisbon, Portugal

Well so what do you call your early work in school, teaching in different levels, stimulating the students to find their own ways of thinking, what is this?

Leen Van Duin, Delft, The Netherlands

This is teaching, yes, of course.

Joaquim Braizinha, Lisbon, Portugal

What is teaching, now that this notion of research has been introduced into the universities? What we do is research, basic research perhaps, but it is research.

Kees Doevendans, Eindhoven, The Netherlands

Maybe a sabbatical is what we all need – no students, just typewriting.

Dimitris Kotsakis, Thessaloniki, Greece

Yes, maybe we do need a sabbatical to understand what we mean by the word research, because it has changed completely. If we start with the Berlin Statement, we have a European Higher Education Area and a European Research Area; in other words, between the two statements, Bologna and Berlin, these were two separate areas. Then we come to the spurious division between universities and polytechnics, and so on. Now, this distinction has become meaningless, because they both belong to the higher education area and neither belongs to the research area, so all this business about first and second level higher education belongs to the past. We have to redefine things from the beginning. To my mind, the concept of a university, no matter what it is called (for in different countries they give them different names) is an institution with both research and education. That is the way things were in the past, and may be in the future, but it is not for the present. It is up to us to understand how to go about doing it. So we have to start thinking again. That is my first comment.

Now if we start thinking again, then we find that we do not understand the concept of research anymore: that is the second problem. Because research has become a new profession, and the researcher is now a professional, but we don't know what kind of profession this is. They call it an innovation-producing profession, so that the researcher

is a 'producer of innovation'. But what is innovation? What is a 'producer of innovation'? What is his job definition? We do not know yet, so we have to define it. But do we really need to define it? Do we need this new professional known as a researcher, a researcher as opposed to a teacher, or a designer? The professions are proliferating: there are thousands of them now – well, not thousands, but last year I counted sixteen. I will not list them all, but they include "researcher" and "professional writer". Professional writers are not researchers, but they write books, articles, critiques, and so on; so this is a profession: the profession of "writer", on a par with the profession of "researcher" or "teacher", who in turn is not a researcher, or a writer, or a designer. Well, my plea is that we say 'enough is enough' with this proliferation of professions and I propose that we start putting these professions together.

Kees Doevendans, Eindhoven, The Netherlands

Any remarks?

Gunnar Parelus, Trondheim, Norway

I think that we need to start on a very basic level. There is some uncertainty about whether art, design, research, and science are all considered equally valuable activities as a basis for teaching. We talk about research-driven teaching, but not about art-driven teaching, although we should, I think, because in my opinion these two things are equally important. Art is searching for truth in some way, and we certainly need teachers who strive to find and fight for what is true both to art and to science. If we can agree on that, we do not need to talk about whether doing design or doing art is research or not, but we can just discuss them on equal terms as a valuable bases for teaching. And then, on the next level, you can have research based on true design, but that is pure research: it is not making art or producing valuable artefacts, but a means of gaining knowledge. That is a secondary question, however. What we first need to establish is that, as I said, science, research, art and design are all equally important to a good school.

Kees Doevendans, Eindhoven, The Netherlands

Thank you. Perhaps we can conclude our discussion with this, although I would like to respond to it, because when we talk about research we are not just talking about our schools. We are talking about research programmes, international programmes, networks, and not only about our schools. Of course our schools need art, design and research; but research is not just limited to the studio. Of course there is some research in the studio, but it is mainly for the purpose of teaching students, educating them in some generic skills to become academic professionals. And there is research in the schools, but it is not limited to the school. It is not concentrated in one person. I would like to be a researcher myself and take a sabbatical. So you cannot limit it to your school, I think.

Gunnar Parelus, Trondheim, Norway

Yes, but we are meeting here as Heads of European Schools.

Kees Doevendans, Eindhoven, The Netherlands

But a school is not isolated, it is not an island. We have to bring this session to a close now, so we will not do the exercise with the competences. In any case, we all have the questionnaires that have been distributed by e-mail, so we can work on them at home. Loughlin?

Loughlin Kealy, Dublin, Ireland

In a way, Kees, I think it covers to some extent what you were about to say. I would just like to take a step backwards in time and remind people that what we are engaged in here is an exercise of enquiry: it is not actually an attempt to define what research is and how we understand it. That is not the nature of the exercise we are engaged upon here. It is rather a process of trying to understand what research represents in the field of architecture, and for that reason we have created some questionnaires; but we need your responses if we are not going to keep on having the same conversation every year. So I just want to finish by asking people to please complete the questionnaires if they can, and let us try to move the discussion on one small step further.

Kees Doevendans, Eindhoven, The Netherlands

Thank you very much, Loughlin, for these wise words.

I started by speaking about the continuity. We started with Hania 2003, and how difficult it was to talk about research. We then we did some exercises, which may have improved things a little; but I want to stress this continuity, and the fact that it is also based on your filling out these questionnaires on competences, and then we can see if a working group, either the old group or a new one, can make a report on the results that can be sent to you. So please take Loughlin's wise words to heart and fill out the questionnaires, and send them to a lot of other teachers and ask them to fill them out also. Then we can try to make the discussion more precise in terms of competences; and, as Pierre Von Meiss suggested, we could also add some examples of how we teach these competences at the different levels, and in what type of courses. This could perhaps lead to a series of transactions, which would yield a kind of classification of competences, and within these transactions we could give examples of courses and projects where these competences are taught.

I would like to thank you all, and especially the members of the panel. Thank you very much, and I hope you enjoyed this session on research and that there have been some learning outcomes in it for you.

Chapter 4

Learning Outcomes and Competences Related to the Profession(s) that 'Emerge' from Architectural Studies

Which are the desired learning outcomes and competences including skills, knowledge and content of the professional profiles related to architectural education? What are those profiles? How can the above competences be translated into contents of the curriculum (topics to be covered) and structure of the curriculum (modules and credits)? What are the strategies for and objectives of this translation? Which priorities and which values and ethics of the learning outcome? Which approaches to teaching and learning are appropriate to ensure those learning outcomes and competences (types of methods, techniques and formats)? Which methods of assessment can we apply to evaluate the achievement of those competences (when required, which kind of teaching material should be produced)? Which educational units and activities should be created to achieve the defined learning outcomes?

Interventions of Session 4

Panel

Joaquim Braizinha, Lisbon, Portugal

Juhani Katainen, Tampere, Finland

Guido Morbelli, Torino, Italy

Aart OXenaar, Amsterdam, The Netherlands

Are Risto Øyasaeter, Trondheim, Norway

Spyros Raftopoulos, Athens, Greece

Chair

Loughlin Kealy, Dublin, Ireland

Questions for Session 4

Question 1 (5 minutes)

In a changing society where demands tend to be in constant reformulation, what are the professional activities that your new school curriculum can ensure that your graduates can practice?

Question 2 (5 minutes)

What are the five fundamental competences and skills that your new school curriculum ensures to your graduate in order to enable them to practice the above professional activities?

For your help we propose to you to use the following (open ended) list

1. Ability to create architectural designs that satisfy both aesthetic and technical requirement
2. Adequate knowledge of the history and theories of architecture and related arts, technologies and human sciences
3. Awareness of the issues and themes of present day architectural debate
4. Ability to recognize and use appropriately architectural theories, concepts, paradigms and principles
5. Knowledge of the fine arts as an influence on the quality of architectural design
6. Knowledge of contemporary and historical works that have achieved the highest standards in architecture
7. Ability to abstract and present key elements and relationships
8. Adequate knowledge of urban design, planning and the skills involved in the planning process
9. Understanding of the relationship between people and buildings and between buildings and their environments, and of the need to relate buildings and the spaces between them to human needs and scale
10. Awareness of the potentials of new technologies
11. Understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors
12. Critical awareness of the political and financial motivations behind clients' briefs and building regulations so as to develop an ethical framework for decision making within the built environment
13. Critical awareness of the relationship between current developments in architecture and the past
14. Understanding of the methods of investigation and preparation of the brief for a design project

15. Understanding of the structural design, construction and engineering problems associated with building design
16. Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate
17. Necessary design skills to meet building users' requirements within the constraints imposed by cost factors and building regulations
18. Adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning.
19. Ability to work both with a high degree of autonomy and collaboration
20. Ability to engage in self-managed and life-long learning (eg working independently, time management and organization skills)
21. Awareness of the need for continuous professional development
22. Ability to respond creatively and flexibly to changes in the professional environment
23. Ability to communicate appropriately to a variety of audiences in oral, written and graphic forms
24. Other...

Question 3

How does your new school curriculum ensure these competences and skills in terms of:

- Related subject areas (what subject areas can ensure these five characteristics of the professional profile)
- Positioning, timing and weight in the structure of the curriculum (in which years of studies are the five characteristics ensured, in what relation with other subjects, and what is the importance of these subject related areas compared to other subjects in the overall school curriculum).

Chairman's Introduction

Loughlin KEALY

University College Dublin, School of Architecture, Dublin, Ireland

Good morning! This is the fourth session of this meeting at Hania, and we are going to spend some time on the issue of learning outcomes and competences related to the professions that emerge from architectural studies: that is what it says on the top of the programme, and that is what we are going to try to do for the next while. We have a panel here that will assist us in our discussion: from Athens, we have Spyros Raftopoulos, who is the Deputy Dean at the School of Architecture of the National Technical University; from Lisbon, we have Joaquim Jose Braizinha, who is the Director of the School of Architecture at the University Luisiada; from Tampere, we have Juhani Katainen, who is a Professor of the Department of Architecture at the University of Technology; from Torino, we have Guido Onorato Morbelli, who is the President of the Course of Studies in Architecture at the Polytechnic of Torino. From Trondheim, we have Are Risto Oyasaeter, who is the Pro Dean of the Faculty of Architecture and Fine Art at the Norwegian University of Science and Technology, and from Amsterdam, we have Aart Oxenaar, who is the Director of the Academy of Architecture. My name is Loughlin Kealy and I am a Professor of Architecture and Head of the School of Architecture at the National University of Ireland in Dublin.

So, this morning we have a panel here, each member of which will address each of the three questions, as you know from the papers that were circulated. And these questions are related to the professional activities that your school curriculum assures that your graduates can practice; then, there are a set of competences for discussion and elaboration and comment and so on; and then a third question is how your school tackles the question of ensuring that these competences can be transmitted or learned. I have asked the members of the panel to speak for about ten minutes each, and I have also said that it might be useful just to have a very brief one-minute statement on the legal position of the profession in their country, in other words, basically whether the function and title of architects is protected by a legal framework or not, just to allow us to put these things in context. But our discussion this morning is primarily about learning outcomes, rather than lengthy discussions about the structure of the profession and so on. So, I am not sure who would be queuing up to begin first, but since I have a list here which is roughly in alphabetical order I am going to start in roughly alphabetical order, and Aart, since Amsterdam come before Athens, I will ask you to begin.

Competences Related to the Profession(s) that 'Emerge' from Architectural Studies at **Amsterdam** School of Architecture

Aart OXENAAR

Amsterdam Academy of Architecture, Amsterdam, The Netherlands

Thank you Mr. Chairman. First, I will give you a very short statement about the position of the profession in Holland. It is quite simple: we have a legally protected title, with a register of architects, urban designers and landscape architects, but we have no professional protection. Anyone can put up a building as long as they do not call themselves architects. If someone wants to be called an architect he has to be registered in order to obtain the title. I will not follow the three questions, but I will try to make a statement in which the three questions will, I hope, be answered.

Our academy is rather a special school, so in that sense I am the odd man out to begin with. We are a design school, created by designers for designers. The school started as an association of architects that decided they needed new talent, which they chose to train themselves; and it has remained like that. We offer a four-year Master's programme, with two years of academic training and two years of professional training. I will explain a little more about that later.

Each of the three disciplines within the school – architecture, urban design, and landscape architecture – is taught in constant consultation with the others, and focusing in a practical way on the changing demands of society. And we obtain this goal through a rather special system on two levels: first we do not have any fixed teachers – there is no tenured staff – all teachers are practicing designers that come into the school for specific projects or lectures. For 250 students we have up to 500 teachers coming in each year, some for sixteen-week projects and some for a single lecture, so the profession has a very direct input. They can formulate their own assignments within the set aims and competences, of course, of our academic programmes, and thus they bring in both the themes they are working on in practice, the acute briefs, but also their research questions.

The second element through which we obtain this idea of a professionally oriented design school is what we call concurrency: our students work and study concurrently, that is to say they come to the school twenty hours a week and have to work at least twenty hours in practice. In reality they usually have four-day-a-week contract, and they come to school for twenty hours, thus obtaining a total of 240 ECTS points – 120 academic points and 120 points for an examined role in practice. Given the fact that we already were a Master's programme, and – within changing systems – always have been, we did not develop a new curriculum to adapt to this Bachelor's/Master's system; but we did write a new curriculum for the practical part. This was done specifically at the demand of the visitation committee – we had a visitation accreditation process two years ago – because they said it was time for the academies (there are six schools of this model in the Netherlands) to make explicit, and I quote, "to what extent practice should be part of the curriculum to acquire the title of architect, urbanist, or landscape architect".

In a sense it was quite interesting: the visitation committee asked us to come up with a curriculum for the practicing designer. In doing that, we started, rather basically and simply, by taking the EU directive, which has already been translated into the competences required for registration under Dutch law. So we took what they call the 'beginning terms' for the profession in the Netherlands, we regrouped these into three sets: the more autonomous or disciplinary competences, the contextual competences (that is, the competences that you need to deal with other disciplines), and the professional competences (that is, those skills that enable the student to function as a practicing architect within the building process and within the profession).

The disciplinary and contextual competences we consider as part of the in-school academic curriculum, whereas for the professional competences we made what we call an out-of-school curriculum. Together they form a list of ten competences. I won't bore you by listing them now, they will be translated into English and put on our website, where you can look them up if you like. However, I do think that it is essential to point out that the ten competences we formulated are, of course, not an aim in themselves, and that what we want to assess is the ability of the student to function as a designer; this can be judged by his behavior in the execution of his work, by examining how he acts, reacts and reflects in and upon his work as a practicing designer in training.

We have made that aim visible and assessable through two means: firstly, the students make a portfolio in which they represent the work that they have been doing in the firm and which is checked by the mentor in the firm – they can always come up with all kinds of nice pictures of the wonderful buildings the firm is doing, but we want to know exactly what the role of the student was and what designs he worked on; and then they make a report in which they not only describe and reflect upon what they have been doing, but also give what we call a *plan de campagne*, thinking ahead and saying what their next step could or should be, based upon what they have done and how they have progressed.

We have been working in this way, without a written curriculum, for almost 100 years now, so we have considerable experience in doing this. The reality is that most students acquire the ability to deal with, and the responsibility for, all the phases of building design, from initial sketch to final working drawings, in reverse order. They usually begin by making technical drawings and details for the plan to be executed, and end up as assistant designers, or involved in the first design sketches, or as project leaders. I chaired the "beauty committee" in Amsterdam for a while, and quite often students of mine would be presenting projects, because by their third year they would be responsible for one project within the firm. We did an interesting exercise: we put the curriculum we made next to the 'function families' (as they call them) of the Dutch Architects Union, which they have formulated in order to set the tariffs for work (and where by the range of tariffs you can see the range and the build-up of work reflecting the growing level of activity of an architect, or an architect-to-be, within the firm), and they matched quite well; so, in a sense, with our new curriculum we also follow the architect in his growth from a novice designer with an engineers diploma to a fully fledged designer.

You must be aware that students come to us with a Bachelor's degree in engineering, so they have already acquired the technical side. Now there is, of course, a practical problem with this system, which is that we cannot and do not want to make a three-party contract. You may all be aware in your own countries of different forms of 'dual learning',

as we call it in Holland, where you learn partly at school and partly in a company, which usually involves a tripartite contract between the school, the employer and the employee; but this is something that we do not want and in fact cannot do, given the fact that our students have a normal contract as employees of an architectural firm, and we cannot interfere with that.

The essential thing is that it is the students' responsibility to acquire professional skills and to give proof of them to the academy. It is their own responsibility to go out into the profession, acquire skills and competences and prove to us that they have them, and the portfolio and the report are how they do that. A student's mentor or employer has a role in the sense that he affirms that what is included in the portfolio is indeed what the student has done. The academy then has special examiners to evaluate the portfolio, and the examined portfolio is part of the year exam, which means that it is required to pass the year, and conversely that a student can fail a year even with a fully approved practice of at least twenty hours a week during the year. And indeed, one result of this exam may be that we advise students to move on in their career, either by going to another firm which will give them the possibilities they need, or by talking to their mentor-architect at the firm.

I think that, from this point of view, it is clear that practical training is a very serious thing for us, and if we take it seriously I don't think that we can stop at, and I don't mean this disrespectfully, filling in a shopping list of what we are giving, and by just saying that by putting four or five major points within normal academic training we will prepare students for practice. I think that it is a matter of 'either/or', and that a distinction should be made as to what an academic curriculum is and what is part of practical training. And I also think that schools should be allowed to decide for themselves what they are. If they are for academic training, the 3+2 system, which most of us are, that is fine, but stick to that. Delft is very clear on that: they say that they give academic training, and that becoming an architect is another story – that comes with practice. We say that we give academic training concurrent with practical training, but that takes two more years.

I think that part of the discussion here could be whether we, as schools, think that it is important to play a role in the formation of an architect as a practicing professional and, if so, we should think about a system of rules and regulations into which these two years would fit, or we should simply say that we are academics, we do academic training, and the profession is a different thing altogether. And, to add one small point: the EU is not helping us here. It used to be in the regulations that architects should have these two years of practical training, but this was taken out at the Maastricht Treaty for competition reasons; so now it is up to each school to discuss it with the professional associations in their country. Or perhaps we could initiate a discussion here. In that sense I was very interested to hear that James Horan opened the way for a working group where schools and professions within Europe could start discussions again. Thank you very much.

Loughlin Kealy, Dublin, Ireland

Thank you very much, Aart. That was a very clear and succinct presentation. I have just one question – a clarification, really: in your relationship with the profession, is there any periodic formal evaluation or feedback to you about the success of your programme?

Aart Oxenaar, Amsterdam, The Netherlands

I don't know if I should use the word formal, but indeed this was one of the points that the visitation committee raised: how much contact do you have with the people that are in fact responsible for half of your ECTS points? We have always been very careful, because if you make it too formal the school becomes an accrediting institution for the practices, and we become the ones who say which is a good firm for training architects and which is not. We have always been very reluctant to do that; but we do have annual meetings where we inform and discuss with the firms, group sessions and, from time to time, individual meetings. Also, you mustn't forget that, since all our teachers are practising architects, many of them also end up training our students. So in a sense it is a very closely-knit network in which we are operating.

Competences Related to the Profession(s) that 'Emerge' from Architectural Studies at **Athens** School of Architecture

Spyros RAFTOPOULOS

Technical University of Athens, School of Architecture, Athens, Greece

Following the example of the previous speaker, I won't try to answer the three questions precisely, but I will attempt to present, more or less, what we are doing and, as much as possible, the relation between our academic profile and the profession. But before going into any details I would like to give a few particulars about our school. It is a school of architecture that belongs to the National Technical University of Athens; in fact its formal title is Architectural Engineering, even though we tend to try to forget the engineering part and stick to the architecture part.

It is a relatively large school, which has grown quite considerably over the past few years, with about 1700 active students – and if you count the dormant students the total is more than 2000. To continue with the statistics, which I know are not very interesting but I think they give a picture of our problems, we have approximately 105 permanent staff members, of which, approximately again, 60% or 60-65 people are architects, most of them practicing architects. We also have about 20 planners, and the rest belong to many other disciplines, including engineers, mechanical engineers, artists, and so on.

The curriculum is organized as a five-year continuous comprehensive programme; there is no breakdown, so students formally finish their studies after their fifth year. I say formally, because due to the workload the majority do not finish in less than six or six and a half years. Now, trying to relate the structure of the curriculum with the profession, we do not have a direct link with any practical experience or anything like that, apart from whatever

voluntary work students may decide to do during their studies or during their holidays. Nevertheless, in our experience, and that is largely related to the fact that most of us are practitioners, we think that the curriculum is linked to the demands of the profession, and I will explain that link later.

The curriculum itself is design-oriented, so starting from the first years we have some compulsory subjects that try to give students global knowledge; and then, in the latter part of the programmes, we have in the past few years introduced – with the new curriculum we have applied – what we call the integrated design studio, which means that the professors, or tutors, who have an almost one-to-one relation with the students, are from different disciplines. This includes not only academic disciplines but also designers, construction people and other specialists, who try to give students some exposure to the actual practice of architecture.

We also have certain other compulsory subjects, such as dissertation; this means written dissertation, because we consider that an architect should be able to write and to present his work in either written or oral form. So in the ninth semester students have to do what other people may call research study under the guidance of a tutor. They choose their own subject and their own tutor, and then they have to prepare their written dissertation and to present it orally to the public in an open sort of procedure where anyone can come and listen to the presentation.

Finally, the focal point of the whole programme of studies is the final thesis. This has to be a design thesis – it can't be anything else; and it takes a long time for a student to complete, which explains why the period of study is usually so prolonged. The minimum time is supposed to be six to nine months, but the most students spend a year or sometimes more – the extreme being two or two and a half years – preparing their design thesis, which is a complete study of a building, or a complex, or whatever they have chosen. They choose the subject, we approve it, and then they choose the tutors that they want to supervise their design project to the end. Once they have finished this project they have to pass the examinations, which are normally reviewed by a jury of at least five professors and one external examiner – and there is one of the links that we have with the profession: we ask the official bodies of architects or engineers to supply us with people that will react to the quality and the standard of the study itself.

Going a little bit further and trying to go over the curriculum without going into any more details, the profession in Greece is a controlled body of people that qualify as architects after sitting a formal examination at the Technical Chamber of Greece. It is rather a formality, but still, the students that finish their studies have to present their final design theses to a committee from the Technical Chamber of Greece, which represents the entire body of engineers of Greece, civil engineers, mechanical engineers, and so on, and which actually awards the licence that enables a person to call himself an architect and to practice architecture.

The reality is that we now have approximately 15,500 architects in Greece, which is an enormous number for the size of the country. Most of these have graduated from the schools of Athens and Thessaloniki, while now a number of new schools are also starting to produce graduates. There are also a lot of people who have studied abroad and are licensed to practice in Greece on an equal footing.

To give you some idea of the state of the profession, as you yourselves may have realized from the building environments you have seen, very few buildings have actually been

designed by architects. We also have a great number of civil engineers – about 20,000 – who have the same license and can also practice architecture, as well as quite a large number of people who have completed a three or three and a half year programme in a technical college and who can also practice architecture, but on a smaller scale. There are some restrictions on the latter, for instance the majority cannot belong to the Technical Chamber, but they are licensed to 'design' buildings of up to a certain size. In fact, as a study conducted two years ago showed, architects were actually employed in no more than 5% of the buildings in Greece.

In conclusion, I would like to say that, apart from the curriculum and the comprehensive architectural degree that we give, we also have post-graduate specialized programmes in conservation, theory of architecture, and planning, in order to give a bit more of what people may call a Master's degree, as it is called in the Anglo-Saxon countries. As a final point, I would like to say that I would hesitate to try to pin-point any fundamental competences as they are listed in the paper that we received, and that it is very difficult to choose one or another as higher or better. I think that one would have to have just one basic required competence, such as the ability to create architectural design, and that everything else is complementary to this basic competence. This is what we are trying to do with the curriculum; and, based on the reaction we are getting from the professional body, we think that up to a certain degree we are succeeding.

Loughlin Kealy, Dublin, Ireland

Thank you Spyros. Again, I have one question, and it is whether the Chamber or the architectural profession has any direct role in shaping your curriculum and in deciding what is taught.

Spyros Raftopoulos, Athens, Greece

No, there is no direct involvement of the profession in the formulation of the curriculum at all.

Guido Morbelli, Torino, Italy

If I understood correctly, you said that the students at the end of their studies make two theses – a written dissertation and a design thesis?

Spyros Raftopoulos, Athens, Greece

Yes. That's right.

Competences Related to the Profession(s) that 'Emerge' from Architectural Studies at **Lusiada-Lisbon** School of Architecture

Joaquim Jose BRAZINHA

University of Lusiada, School of Architecture, Lisbon, Portugal

My school is one faculty in a private university that offers all the other fields of study, such as law, psychology, management, economics, mathematics, history, design, industrial design, and patrimony sciences. The university is twenty years old, and my faculty has 2300 students and 150 teachers, all practicing architects. Of these 150 teachers, 20 hold PhD's, 50 have Master's degrees, and 80 are assistants without academic qualification. This is because we have a very narrow law that obliges us to have one PhD for each year of studies and one PhD for every 200 students, and the same number of MAs.

We are under the supervision of the Ministry of Education, and they are always disturbing us with enquiries, visits, qualifications, and so on. It is a single unit five-year curriculum, and the four first years offer plenty of global knowledge but centered on architectural projects, what are generally called laboratory projects, with twelve hours a week in each year for secondary courses in other disciplines – history, structure, construction, sociology, economics, and so on. The course-load in these early years is 28 hours a week, and we might prescribe a further 28 hours of work a week for the students. As you see it is a full-time course, we don't leave them much time to play. The last year has only 18 hours a week of class-work: 16 hours on projects and 2 on urban and architectural law. And the students have at least 38 hours of individual work, because, at the end, after the fifth year, we have an exam with a special jury that includes people invited from other countries; this is a public exam where the students are obliged to explain all the work they have done.

After this students can enter their names in the Order of Architects, after which they have to do one year of compulsory practical training supervised by the Order. They apply for this practical training and, when it is completed, they have to prepare a portfolio of all the projects they have done and from all the types of work they can do. Then, they may or may not have to sit a final exam, depending on whether or not their school is recognized by the Order.

We are licensed by the State to offer Master's degrees, and we have four Master's programmes. According to Portuguese law, these must be two-year programmes; the first year is elective, but during the second year the student must develop his thesis with a supervisor, and then there is a final exam. We have four Master's programmes: theory of architecture, technology of architecture, architectonic patrimony (this has to do with pathologies and intervention in the patrimony), and sustainability. We also have the capacity to offer PhDs, which according to our law requires five years, but I think that is too much. Most of the MAs and assistant teachers have already approved the PhD plan, and our supervisors are working on it.

recognize the programmes or degrees; this accreditation is carried out by means of panels, reviews, visits, and so on. Sometime in October or November we are going to have a new accreditation visit. The Order has no sympathy with the 3+2 system; they want the unified five-year programme according to European legislation and our traditional practice.

Concerning the list of competences, I would like to say that long ago the University defined five very generic competences: general knowledge of the field, theoretical and cultural knowledge of architecture, technical and practical knowledge, social and communicative skills, and self-management. I think that all of these competences can be included here because they are very generic.

We are the biggest university and the biggest school of architecture. There are several other private universities (the public universities have a *numerus clausus*, so they have a small number of students), but we have the biggest faculty with the most visibility in the field. At the end of the courses, and after the practical training, the new architects can work by themselves, or in enterprises, in municipalities, in central government, in construction – they have a wide field of opportunities. A survey made in the course of the most recent accreditation process showed that our graduates find jobs within three months of finishing; there is no unemployment among young architects. Portugal may be a small country, but there is a great deal of activity, and job opportunities are a question of self-management, I suppose. Thank you.

Loughlin Kealy, Dublin, Ireland

Thank you, Joaquim. I have more than one question for you. First, I would like to know whether the Ministry has any role in regulating your curriculum or is that done by the order?

Joaquim Jose Braizinha, Lisbon, Portugal

Yes, the Ministry is involved; in fact everything is controlled by the Ministry. In Portugal the Minister appoints commissions for each scientific area, to think about and to form our position according to the Bologna Agreement. The commission on architecture is headed by Dominco Tavares who was the Director of the School in Porto. He worked with people from all the different schools, and we were invited to propose a minimum curriculum and to comment on the single five-year programme; and then we have three months in which to propose a new curriculum, which the Ministry will have to approve.

Loughlin Kealy, Dublin, Ireland

OK. I have a linked question, which is whether the Chamber is also governed by law. The Chamber, the actual functions of the architects' Chamber.

Joaquim Jose Braizinha, Lisbon, Portugal

No. It is controlled by the order.

Competences Related to the Profession(s) that 'Emerge' from Architectural Studies at **Tampere** School of Architecture

Juhani KATAINEN

Tampere University of Technology, Department of Architecture, Tampere, Finland

Introduction

The new university law and its statutes has now passed the Parliament and stands in order next fall 2005. Our students are selected via competitive system specially developed for our schools of Architecture. Yearly intake today is 120 students for three schools of Architecture. In the coming system they are selected for both phases: BA and MA. The students, who have started earlier, have right to study following the existing system. When changing the system after Bologna Declaration we found that our existing ways to study can be fluently adapted to the two-phase studies.

Only problem is the shortness of the whole, when also diploma work is included to the two years of Master studies.

Our students work while studying and we see this very important part of their studies. It is really difficult to simulate the Architects' office work at school projects. Real life is better teacher in practice. Working has naturally prolonging effect to the studies; this has been so far accepted, although contrasting views have been lately expressed, mostly from bureaucratic sides. Our teachers have normally very close connection to the working life which also helps students to get good information about the Architects' duties.

Bullet points

The Architects title is protected by law in Finland. Also our latest Building law defines more than before about the qualities, what has to be expected from those who design buildings and built environment.

Most teachers come from practise and they are practising also while teaching.

Most of our students have working experiences while studying.

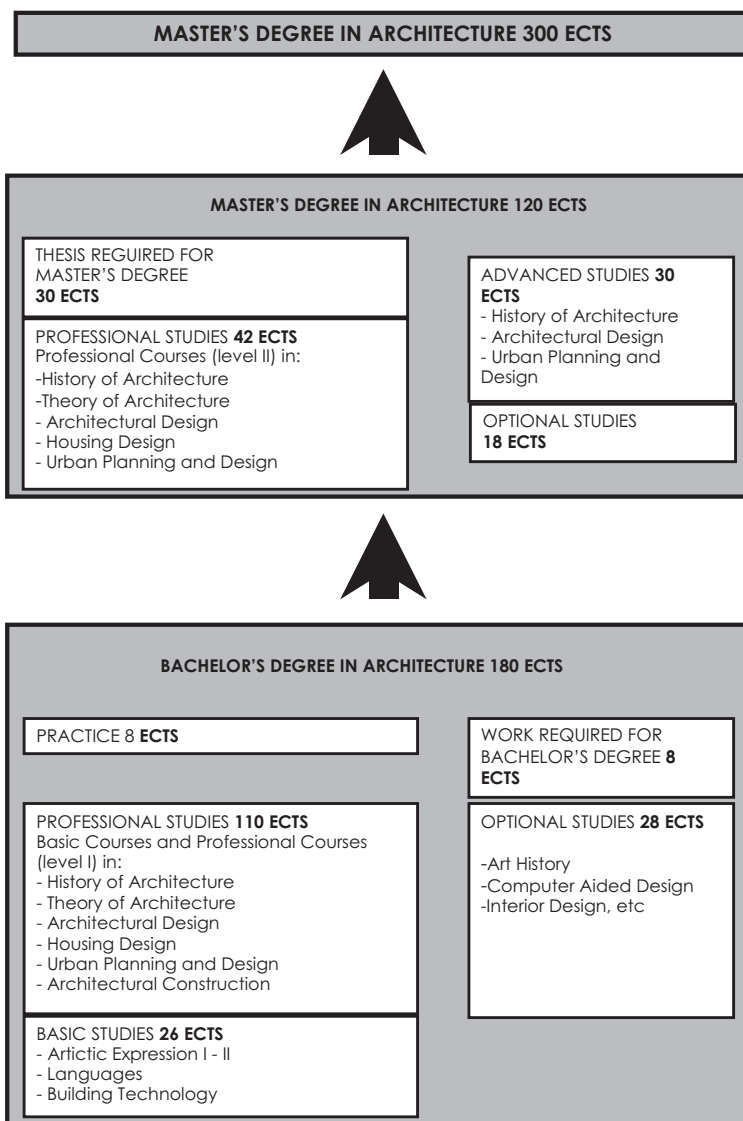
We evaluate our schools' success via our students success in real working life.

We have (voluntary) register for the practising architects, to get registered one has to have three years practice after diploma.

The answers to the posed questions:

1. Our curriculum divides its time between:
 - Architectural Design
 - Urban Design
 - Architectural Theory and History, including repair, restoration
2. Five fundamental competences (the given frame as a whole is very good and it is very difficult to make a choice). My personal selection is as follows:

- ability to create architectural designs that satisfy both aesthetic and technical requirements.
- ability to recognize and use appropriately architectural theories, concepts, paradigms and principles.
- understanding of the relationship between people and buildings and between buildings and their environments, and of the need to relate buildings and the spaces between them to human needs and scale.
- understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors.
- ability to work both with a high degree of autonomy and collaboration.



Competences Related to the Profession(s) that 'Emerge' from Architectural Studies at **Torino** School of Architecture

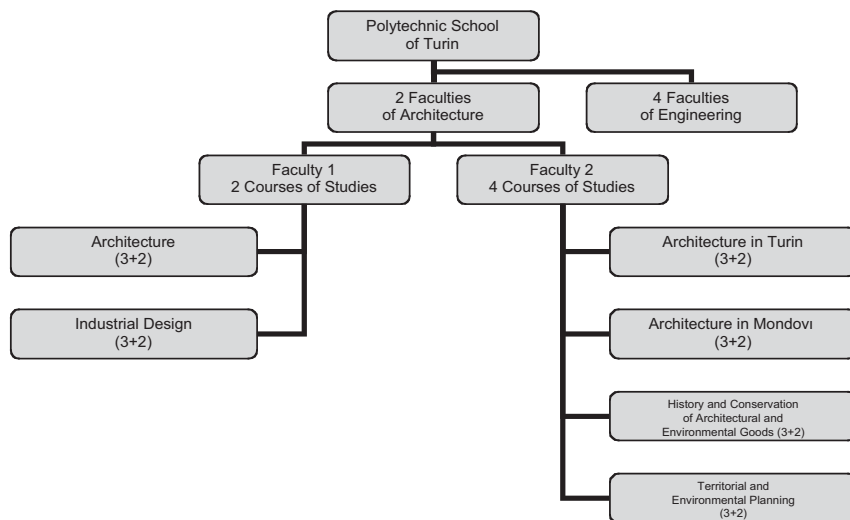
Guido Onorato MORBELLI

Torino Polytechnic, II Faculty of Architecture, Torino, Italy

Question 1

The *Politecnico di Torino* consists of 4 Faculties of Engineering and 2 Faculties of Architecture, at their turn subdivided in various Courses of Studies (Diagram 1). The *Politecnico* has now about 26.000 students (about 6800 of them in Architecture and 18.000 in Engineering) and 875 lecturers (201 in Architecture and 674 in Engineering).

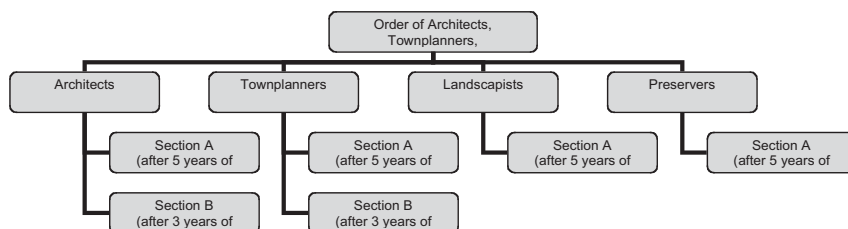
Many Italian Faculties of Architecture – the Torino one among the first – underwent, after the year 2000, the radical transformations suggested by the Sorbonne and Bologna agreements and introduced in 1999 – as an option left to the various Universities – by the Italian Ministry for Education, University and Scientific Research. The Architectural Profession was then obliged to adapt to them.



The old Faculty of Architecture of Torino, forming since about 75 years an architect capable of coping with the whole range of competences guaranteed by the Law, "from the spoon to the master plan", was split in two:

- *Faculty 1*, formed by two Courses of Studies - in *Architecture* and in *Industrial Design* - dishes up a "traditional" Architect-designer in the former and an Industrial Designer in the latter. The Industrial Design Course of studies is very successful (about 120 enrolments per year), but does not qualify its graduates (*laureati*) to any institutional professional Order. Faculty 1 has about 3500 students and 91lecturers.

- *Faculty 2*, subdividing its competences into *four* Courses of Studies: two in *Architecture* (in Torino and in Mondovì, a small town 80 km south of Torino), one in *History and Conservation of Architectural and Environmental Heritage* and another one in *Territorial, Urban and Environmental Planning*, qualifies (after a period of professional training and a State examination) to the various Sectors of the new-born (or, if you prefer, transformed and renewed) Order of Architects, Planners, Landscapists and Preservers (Diagram 2). Faculty 2 has about 3300 students and 110 lecturers.



Both Courses in Architecture qualify to the main Sector of the above-mentioned Order, enabling its members to perform any sort of architectural service, exactly as they have always been doing in the years before; the other two qualify to the homologous Sectors of the Order, enabling to make works of conservation or townplanning *only*.

In no Faculty there is, as you certainly realized, a Landscape course.

All Courses of Studies of the two Faculties last 5 years and have a 3+2 format, with 180 ECTS in the first 3 years (leading to the *Laurea*) and 120 ECTS in the following 2 years (leading to the *Laurea Specialistica*, the Italian equivalent of the European Master Degree). The 3-year courses are completed with the submission of a student portfolio, the following 2-year courses with the submission of a thesis.

Since the conservative and planning competences are largely cared in Faculty 2 by the above mentioned last two Courses (*History* etc. and *Territorial* etc.), both Courses in Architecture were more concentrated on a figure of architect-designer, characterised in their case by different approaches, relying on the presence in each Course of well qualified competences: the course of Torino insists on a kind of formation largely based on the teaching of History of Architecture and Building Restoration, while the course of Mondovì assumed environmental and landscape characteristics.

Both Courses in Architecture lead, after 3 years, to the *Laurea* and aim, interpreting the very vague expressions of the reforming legislation and of the ministerial circulars, to the formation of a minor technician with sufficient professional knowledge, employable in private professional offices or in the Public Administrations as a collaborator, not as a full architectural designer or as an executive. The 3-years *laureati* in Architecture (as in Territorial, Urban and Environmental Planning) can enter the corresponding Section B of the Order of Architects etc.

The Specialized Architect (attaining his *Laurea specialistica* after the 2 years of studies following his *Laurea*) of Torino will carry out design tasks at any level: new buildings, architectural restoration, urban design, general and detailed plans; it will also be possible for him to teach in the secondary school or to try the academic career.

The Mondovì architect will carry out more or less the same tasks of the Torino one, but with a special interest for environmental and landscape problems, such as bioclimatic architecture and landscape plans.

In order to complete a possible landscape vocation in *both* Courses (Torino and Mondovì) was instituted, in association with the Faculty of Agriculture of the Torino University, a *Laurea specialistica* in "Garden Design" (*Progettazione dei giardini*) which, with the exchange of 25 ECTS (on 120) between the two Faculties, will form a Landscape Architect accepted in his special section of the *Ordine degli Architetti* etc. Our students willing to enter this Course must follow a "green path" in the first 3 years.

The link of our Courses in Architecture to the "social demand" should be assured by the so-called "Club of Institutions" bringing together all Institutions of the civic society (such as Local Administrations, Chamber of Commerce, relevant industries, Trade Unions etc.), which should meet once an year and advise our Faculty about the adherence of its Courses to the real word.

Question 2

We hope that the five fundamental competences and skills that our new school curricula ensure to our graduate are:

- in both Courses in Architecture: N. 1, 10 and 11;
- in Torino: N. 2 and 13
- in Mondovì: N. 8 and 9

Question 3

Our new school curricula should ensure these competences and skills in terms of:

- Related subject areas in both Courses in Architecture:
 - N. 1: Courses of *Architectural Design* and of *Science of Constructions*
 - N. 10: Courses of *Building Technology* and of *Applied Physics*
 - N. 11: Courses of *Surveying* and of *Sociology*
- Related subject areas in Torino:
 - N. 2. Courses of *Theory of Architecture* and of *History of Architecture*
 - N. 13 Course of *Architectural Restoration*
- In Mondovì:
 - N. 8: Courses of *Town Planning* and of *Town Design*
 - N. 9: Courses of *Landscape Ecology* and of *Botany*.

Loughlin Kealy, Dublin, Ireland

Thank you, Guido. That sounds like a very complex system, and we will look forward to reading the proceedings, when we might find it easier to get a grasp of the whole picture. I certainly get the impression – I don't know whether this true or not – that in the principal courses in architecture they would lead to a registered architect in the full sense of the word, whereas the more specialist courses would have a more limited registration, would that be correct?

Guido Morbelli, Torino, Italy

Our profession is protected by the Ministry of Justice, which controls all the professions in Italy; but, as far as teaching is concerned, we depend on the Ministry of Education. As I said, one can enter the profession only through a two-part state examination. There is a written part, in which the candidate has to prepare a summary of a building design (in one day), and an oral part. There is also one year's compulsory practical training.

Competences Related to the Profession(s) that 'Emerge' from Architectural Studies at **Trondheim** School of Architecture

Are Risto ØYASAETER

Norwegian University of Science and Technology, Faculty of Architecture and Fine Arts, Trondheim, Norway

I would like to give you a short review of the context I come from. Three years ago our school of architecture was reorganized as the Faculty of Architecture and Fine Arts, one of seven faculties at the National University. Apart from us there are another two autonomous architecture schools in Norway. We have about 70 undergraduate students and approximately 30 PhD students. I think there is a movement now for our school to strengthen its co-operation with the Fine Arts department.

The university practices a very strong interdisciplinary approach; this is something that we find very interesting, and are taking an active part in shaping and implementing. Another current tendency in Norway is quality reform, which is something new within the university system, and which emphasizes the learning process: instead of emphasizing content, we emphasize the best way of conveying the content to the students. And, as you said, this session was called learning outcomes, which essentially means the kind of students we want to produce.

I think that this is an important issue in discussions about architecture education, because if we managed to remain as a separate faculty when they reorganized the university it was because they recognized that our way of teaching is often very different from that of other disciplines in the university; and in that sense I think this is something that we should be very aware of when we talk about teaching architecture. Another characteristic I would point out is the relation between the profession and education. In the Nordic countries – I can only talk with certainty about Norway – there is no form of qualification demanded from the profession; this is part of a long tradition of basing the contact between education and the profession on trust and on a very close relationship, and there is no desire on the part of the profession for professional accreditation of the education we provide.

I think that it is an interesting task to consider how education and the profession base their cohesion on trust. Speaking of our curriculum in relation to competences with regard to a profession that is constantly changing, I would say that we have a very clear differentiation between the first three years, which are compulsory, and the two final years, which are optional and offer greater thematic freedom. We want to provide a solid base in the first three years through architectural design, to ensure that the basic skills are there, and that is the main goal of having a professionally oriented approach. I think that the competences are ensured through three years of studio training in architectural design as the basis for later differentiations, and I want to point out that we believe that studio training and its proportional share of the curriculum are a very important part of building up professional skills.

It is interesting to note that when you are part of a university this creates a structural difficulty, because we tend to look at our curriculum from the point of view of studio teaching, which causes problems when you start to make interdisciplinary connections – it is a structural problem, which really has nothing to do with content.

To ensure these competences we teach design studios in the three first years, when the students are taught by teams of teachers. They have to work together in groups comprised of architects, artists, engineers, and sometimes sociologists, the idea being to assure a professional approach through architectural design. Contact with the profession is also ensured by having practicing architects teaching in the faculty – we have a pretty strict tradition at our university that people are hired for life, but we are trying to loosen that up in order to be more open to the profession.

We have external examination from the profession on every course throughout the five years, and our thesis or diploma programme is based on individual diplomas in which programming and methods are important elements that the students develop individually. Our reaction from the profession is that they support the diversity in the choice of diplomas or themes that the students work with, and they think that one of the most important things for the school is for it to support an innovative approach in thesis work.

With regard to question two, where you wanted us to indicate whether there is something that is missing from the lists or something that we emphasize, I think that what characterizes our education is competence number 5, which is knowledge of the fine arts as an influence on the quality of architectural design; this is taken care of by artists working in the integrated studios I mentioned earlier. Then, after contact with the profession, I think that we emphasize awareness of the potentials of new technologies, and in the curriculum of the first three years we are trying to reinforce and more fully integrate this element.

An illustration of this integrated way of thinking is that we wouldn't consider a sustainable approach successful until it included the whole spectrum from technology to fine arts. Next, I think, is point number 20, the ability to engage in self-managed and life-long learning. This is an approach that we try to teach to students: they meet every year with the profession, and they meet the profession in relation with the diploma at the end of their course. Another point is awareness of the need for continuous professional development; but, as I said, there are no formal requirements from the profession.

I would also say, concerning this pedagogical approach, that we try to emphasize the way we have organized the faculty. The groups are always organized with practicing architects and very academic, research-oriented people, so that means that we no

longer have a clean group of technologists or historians, but that they are organized in groups, in the organization too.

Loughlin Kealy, Dublin, Ireland

OK. Thank you very much, Are. We have come to the end of the contributions from our panel, and we have a few minutes to spare. Are there any questions for clarification purposes from the participants here? We will obviously return to this discussion later, but I'll take some questions now if there are any.

Roger Liberloo, Limburg, Belgium

I am interested in some more figures from the colleague from Trondheim. I understood that there were 70 students, but are these first-years or...?

Are Risto Øyasaeter, Trondheim, Norway

Excuse me. 70 students are taken into the first year, so that makes approximately 350.

Roger Liberloo, Limburg, Belgium

And how many staff members are there?

Are Risto Øyasaeter, Trondheim, Norway

50.

Loughlin Kealy, Dublin, Ireland

OK. Are there any other questions?

Manuel Nicolau Costa Brandao, Porto, Portugal

I didn't really understand how the last years function at the school in Trondheim. I understood about the first three years, but not the two final ones. You said they function with options? Could you just explain this to me in a few words?

Are Risto Øyasaeter, Trondheim, Norway

The three first years should ensure the basic understanding of architectural design, and then in the last two years the students can choose their courses, but it is still studio teaching. But we have worked on the pedagogy of those courses; so we offer courses where you work as if you were in a professional office, meaning that all the students work on one solution. Another extension, the converse, would be an artist course where everything is open, but it would still have to have an architectural focus.

Discussion

Coordination by

Loughlin Kealy, Dublin, Ireland

Loughlin Kealy, Dublin, Ireland

Just to resume where we left off, we have heard some very interesting presentations, which if anything, I suppose, illustrate the differences as opposed to the commonalities. I think it would be worthwhile to step back for a moment. We are reflecting on the questions of competences and outcomes, and we know that they range from certain abilities that we can define and certain skills that can be acquired; but, I suspect, they also cover attitudes of mind, ethical positions, and so on. These are all tied up with the kind of outcomes you might expect would come from the process of education. As regards the professions we are aware – and we don't really want to labour the point – of the differences between professions in different parts of Europe and in different jurisdictions and so on; but it is clear that there is a relationship between the legal basis on which professions exist and in which architects practice and how those things are interpreted and responded to within various programmes of education.

What, I suppose, is also implicit – we haven't talked much about it at the moment, but the question emerges from architectural education – is that there are clearly some things that can be explicitly taught and other things that are learned rather than taught. And people have chosen learning-teaching situations that they anticipate will give rise to certain skills and competences. What crosses my mind when I listen to the range of contributions here is that, inevitably, we are looking at the social responsibility of schools of architecture.

Architecture, no matter how we look at it, is a public activity. Sometimes it is supported or governed or controlled by state law, in other cases it is not; but either way it has a core place in our own culture, in our own civilization; and to that extent schools of architecture have a very crucial role to play. To me it raises the question of how one comes to a view of how well one is doing one's job. And we have heard some different viewpoints here: people who feel that their school or their teaching is so integrated in the architectural profession that there is no need for formal methods of assessing how well they are doing, whereas in other cases assessment methods are formalized, and in some cases they are overseen by the state. In our own case, our assessment methods are overseen both internally and externally, and also by the professional body. So there is a great deal of variety in that respect.

Just by way of background, Constantin, in his first presentation at the beginning of this meeting, referred to a small sample survey that Lawrence Johnston had conducted. It is in the context of the United Kingdom, where, as you may know, the relationship between schools of architecture, the architectural profession and the state is very formalized; and this questionnaire, which was distributed to a number of practices, simply asked a couple of questions. It asked them what they regarded as the key competences from the list that you saw, and it also asked them how well they thought the schools were delivering them.

These questionnaires are great fun to look at, because you turn up all sorts of interesting things. Now, although I haven't had a chance to analyse them, I thought we could pick out a couple of things that most of us would agree were important learning skills and outcomes from professionally orientated courses, such as, for example, students' ability to work autonomously and also to work with others – you know, this interplay between autonomy and collaboration. And it is very interesting when you see what the practices think: there is a huge difference between how highly the practices rated those abilities and how they see the schools delivering them. If we look at the area of personal, social and communication skills, through writing, speaking, sketching, and so on and so forth, again there is a notable shortfall, but perhaps not as dramatic. And perhaps one should expect that professions always feel that the schools are falling short of what they require. If we look at a core thing like students' abilities to work with a synthesis of forms and ideas and so on, which again we would think of as fairly central to our education, there is a shortfall but it is not dramatic, and practices are probably reasonably content. But if we go to more professionally oriented skills like decision-making, management, and so on, there is a complete difference between the importance that the practices attribute to these kind of skills and what they feel the schools are delivering.

What can we make of these things? It is only an initial and very simple study; but what it perhaps does show is that other people may have very different views of what we are doing from our own; and this, I think, puts a very high premium on feedback and communication, whether formal or informal. I am sure you have plenty of questions, but I would certainly like to see us address this question of how good the connections between the profession and the schools are.

Gunnar Parelus, Trondheim, Norway

I think we need to go back to a very basic question, because we need to understand why it is that we sometimes don't understand each other; and I think there are some basic things that get in our way. I think it has to do with conceptual thinking as opposed to what applies to art and to recognizing art, recognizing a man, recognizing beauty, because you recognize them even if you can't define them. But with conceptual thinking you are just setting the borders of what is and what is not; you're not really concerned with the core qualities that you recognize in a man.

This also has to do with the trusting part: if you really recognize someone you are also able to trust him. Trust is not based on a checklist, being able to check off all the items and define the limits of what makes a man, or a politician, etc. Checklists are fine if you trust the people you are speaking with and you use them as tools for conversation or dialogue, but in the conceptual way of thinking they become a means of control. Then all you can see is whether all the parts are there, or whether something is within a border or not; you're not really trying to recognize if you are meeting an architect or a man or seeing beauty.

There is an influx of conceptual thinking into our discipline and I think that this confuses us. We need to go back to see what we are really doing, because what we are making are things that we are not able to pinpoint. We are able to recognize them but not able to pinpoint them via checklists. The problem when you use checklists is that you don't get the singularity of each person you have to recognize, or each architect you have to recognize as an architect. You don't see that each individual instance really has its own

set of criteria and that if you make a preset list of criteria you lose out on this singularity and the importance of this other thing being there. You merely get this dull kind of normality of thinking that gets you down to the basics, which is barely enough. You get a leveling down of the really important things, down to the outer limits. So we really need to think about how we handle concepts, how we handle recognition and how we handle trust before we lose the key element of our discipline.

Loughlin Kealy, Dublin, Ireland

Thank you. I always think that trust is a two-way process, that has to be worked on all the time, and it is also very important to be able to listen very sharply. I think there is an important issue here, how trust is maintained and built particularly when the pressure is on.

Juhani Katainen, Tamere, Finland

I would like to take an example of the issue of trust. If I heard correctly yesterday, in Holland they are going to drop the financing of the second period of architectural studies. This, if it is true, is an example of mistrust of the profession, because we all know that those five years are necessary. So maybe Aart can tell me whether they are really going to do that, because if they do then we are on loose ground. Not very long ago in Germany the politicians were trying to put the schools back to the three years and were saying that was the maximum they were going to pay for, whether anyone liked it or not, but the graduates would still be called architects. So this is a big question of trust; and if we're losing it we should earn it back and we should be very adamant on this issue. And also, we could use this meeting to send a message somewhere if it's needed, either now or later on. Thank you.

Aart Oxenaar, Amsterdam, The Netherlands

I think that as far as the financial question is concerned we are not threatened at all. Our Master's programme is fully financed, and will be. I don't know about the universities, except that there has been some discussion, but I know nothing about any law that would cut the finances for university Master's degrees, so I don't quite know where the remark came from. Unless Kees has something to say?

Kees Doevendans, Eindhoven, The Netherlands

Well, the finances will not be dropped totally but it's clear that in the universities most funding goes for research, so if there is no research in the Master's phase then there is almost no money. It's also a fact that tuition fees for the Master's phase will be much higher than they are now so that the students themselves will have to pay a lot more money for their studies. That's the mechanism inside the universities. There is a tendency to consider research as much more important than education, and education merely as a spin-off of research.

Aart Oxenaar, Amsterdam, The Netherlands

May I try to bring the discussion back to our theme, which is the relation between education and practice? In my presentation I raised the point of the role of academic training in

the practice of architectural or urban design or landscape architecture. Do we think that the 3+2 system offers any room at all to prepare students for the practice of their profession? I understood from the remarks from the table that we do not. We have relations with professions, and in education we reflect on it, and we have contacts; but as for specific training for the practice of the profession, we just don't have the time. Many countries have now instituted systems requiring one or two years of practice before you can be registered as an architect or formally receive the title.

The next question is whether each of us as individual schools want to be crisp and clear on this and say that 3+2 is training in architecture and that a specific additional period is necessary to become a practicing architect, a professional. Then the next question is, do we leave that to the profession? Do we say that it's up to the specific architects associations in each country or to the state to come up with rules, systems, regulations, exams or however they want to do it? Or do we think that we as educators also have a role in the period that leads to being a fully licensed practitioner? I think that could be an interesting question for us to discuss, especially since this is the trend in Europe. You see different regulations: the British are pretty crisp and clear on it, other countries are less so. Holland is in between - we are halfway between two systems. I hear Denmark is thinking about it. So, this could be a moment for us as schools to discuss our relationship to this "part three", as some call it, and our role in it.

Loughlin Kealy, Dublin, Ireland

OK. Thank you for that. But while I'm quite prepared to concede that we need to refocus every so often, there were issues raised in the previous questions that are also relevant. And I would like to say that in some cases the relationship you're talking about is actually very clear, and I don't accept the kind of dichotomies that you present, I think there are different paradigms of architectural education that we're learning about as we go on.

Herman Neuckermans, Leuven, Belgium

I have a remark and a question. The remark is about the reference to the inquiry in the UK. I have no objection to this kind of procedure, but I would frame it into the wider problem of validation, that is, seeing what competences you claim your graduates have and then afterwards using this as a means of checking whether they have them or not. And this – and this is important, I think – is not just an issue for the practitioners. To some extent or for some questions, maybe, but I would not leave it to the sole judgement of the practitioners.

That's my remark. My question is for Aart, because of the whole panel, in my opinion, the system you presented obviously had the strongest connection between education and practice. And if I understood correctly, half the time or half the credits your students require for a Master's are devoted to practice. My question is, how do you handle the fact that on the one hand your students are already practicing architecture while on the other you are still teaching them? What do you give them that they do not have? How can you co-ordinate these things? Are you repeating what they have already learned? Probably not, but how do you organize the academic education of people who already learned much from actual practice? In the other examples these things are less easily distinguished, because they are mixed. The argument of the others is that they include aspects of professional practice in their academic training, but in your case the two things are clearly distinct. So how do you deal with this distinction?

Aart Oxenaar, Amsterdam, The Netherlands

Let me first be clear that what is taught in the practice period is not part of a normal Master's programme. We give the normal 120 ECTS points for the Master's programme, spread out over four years. So we have, in fact, a full-time four-year Master's programme, of which two years are spent in school, following an academic curriculum, and four years are spent in part-time practice, since you cannot have an eighty-hour working week. So we demand twenty hours of working practice- actually you usually work four days- and we demand twenty hours of working in school.

As I explained in my presentation the way this works is that you can do it consecutively: first two years Master's and then two years of working in practice to obtain your license. We do it consecutively, because we strongly believe that it is a very good thing to have a synergy between working practice and academic learning. In fact that's the way architectural training started – in the 16th, 17th, 18th century it was all working from practice, architectural apprenticeships.

And as I explained, what we see happening in practice is that our students will have a Bachelor's in Engineering, with a concentration in architecture or urban planning or landscape design, and they will start out as draughtsmen in architectural offices, performing basic tasks. In other words, they follow in reverse the whole system of sketch, preliminary design, design, and final drawings. They won't start as a full-fledged architects in their first year of working, but will probably start on final drawings and work their way back to design. The training is mutual, so in that sense it's a synergy and not an opposition.

Richard Foqué, Antwerp, Belgium

I want to make some comments and observations from my own experience, which I think may broaden our discussion this morning. Before my academic career I was the founding partner of a rather large architectural firm, where, of course, we saw a lot of young people from different schools and different countries. When you are looking for a new collaborator – and I suppose this the case in most architectural firms – you usually tend to look for certain profiles. Maybe you are looking for someone who is very good in conceptual thinking or conceptual design, maybe you are looking for a more managerial type of collaborator, maybe for a more technical one, and so on and so forth. And that's exactly what I think is important and what makes it so difficult to get a unified kind of competence for architectural education. I also don't think that it is the right thing to do, because the "ideal architect" is an impossibility – what we call in Flemish a "white raven".

I think that it would be a good idea for schools to focus on certain competences and work on them, build them up to a highly elaborated, professional and scientific level. This would also encourage the diversity and the richness of the different schools in Europe. For as I discovered in my own office there is a rich variety just among the Belgian schools, and I knew exactly that for a specific position I should have someone from this or that school. And I think it's important that every school should do some thinking on that level and ask itself what it can offer. Because I think that as a school you cannot offer everything in relation to practice. And, of course, you have various means of doing it. You can have case studies, which is a fantastic way of dealing with it, I think, or you can have professionals on your juries, and so on.

Aart Oxenaar, Amsterdam, The Netherlands

You said that you know that for a specific task you want someone from a specific school. Can you try to identify what makes the difference between schools? Why is it that one school apparently trains a certain type of architect and another school another type? Is it something in the programme? Is it in the tradition of the school? Is it in the teachers? I would be very interested to know what the differentiating factor is.

Richard Foqué, Antwerp, Belgium

I think it is in all those levels and I think it is very difficult to distinguish where exactly. Of course it's in the programme, of course it's in the courses offered, of course it's in the teaching staff and in the profile of the school itself, in the mission statement and so on; but it's multi-layered, I think. And you will obviously know the situation in your own country better, you will know the profiles of the several schools almost intuitively. This, of course, is more difficult when you are looking at it on the European level, but it should be possible to be more explicit – for example, each school could do that in its mission statement.

Christian Huetz, Regensburg, Germany

I would like to comment on something Loughlin said earlier about the connection between schools and the profession. I think that this is a very serious question and I have one answer, which is perhaps a bit provocative. There are people who say that the moment the graduate of a school can no longer be used in a bureau then the school will have gone a step forward... Well, I think he's got a point. If you focus only on practice, as they do in the Fachhochschule that, I think, is a real danger. Because if you focus only on practice then where is the liberty of teaching? Where is the liberty of learning? Where is the innovation? Yesterday we talked about research and innovation: what happens to them if you think only of what has to be done in the office, what has to be done in the practical placement? This I think is something very serious and very dangerous.

Loughlin Kealy, Dublin, Ireland

Thank you, Christian, that's a very clear position. I can just imagine the response of some of our professionals to the idea of useless students being a step forward...

Christian Huetz, Regensburg, Germany

I'm sorry, I didn't mean useless students, I meant just the opposite. Students who are all graduates, who are really thinking in an architectural manner.

Dimitris Kotsakis, Thessaloniki, Greece

Our problem today is the education of the architect and not education in architecture. But in order to deal with the content of the problem we first must put it in context, because no problem exists out of context. Loughlin mentioned three aspects of this context: social responsibility, architecture as public activity and quality assessment. I will add a fourth point: the autonomy of higher education, freedom of thinking. Now, how are these four things related? If architecture is a public activity, then the responsibility is social and that means an integral social responsibility to society as a whole and not to a practice, an

office, or a particular group of interests in society. So these two aspects are intimately related: architecture as public activity means social responsibility. This in turn means quality assessment, which has at least three levels.

The first, and deepest, level is the university, the education and self-assessment of the educator, who is responsible directly towards society as a whole. Then there are the professionals and, finally, what we call "the state". (This is a serious problem in the European Union, because the "state" is represented by a bureaucracy, so that on the third level the EU member states are dealing with a bureaucracy, but we not discuss that now.)

Now, if we take this as a problem of assessment, we come to the fourth point in relation to context, that of the autonomy of higher education, which means the freedom of thinking and which also means that the responsibility towards society as a whole is assumed by this higher authority in education. In that case the two other assessments, the professional assessment and the state assessment, are inferior because otherwise there would be no such thing as freedom of thinking and no such thing as assuming the responsibility towards society as a whole. Instead, you get responsibility towards the profession or towards one class in society or towards one group of interests.

So that's the context. Now let's look at the content. The content is the relation between education and practice. I've heard the phrase mutual trust, which is a very good phrase, but I do not see any mutual trust. Take the example of external examiners. There are external examiners in every studio, and they come from the profession, but you don't have educational examiners in the professional practice. Each studio in the university has an external examiner, but each office in the practice does not have a teaching examiner, which means that trust is not mutual. So it is a unilateral trust: the university trusts the offices, but the offices do not trust the university. This is not the function of an institute of higher education. It is the function of a lower institution, a servant institution. Now if we are here as servants, then that's all right, we have to be obedient to our masters. If not, we must demand mutual trust, and we must demand mutual trust in all respects.

And there is another question about content. If the university professors who teach design are practicing architects, as they are in many countries, and they are protected by law as both practicing architects and university professors, then the question of obedience becomes double. In this case the university professor is not only obedient to the profession as a professor but also as a practicing architect. So not only is he not free, but he is doubly a servant, both as teacher and as practitioner.

Loughlin Kealy, Dublin, Ireland

Thank you. I'm not sure how this relates to the relationship between academia and the profession in quite the same way, but I take your point about symmetry of trust.

Gunnar Parelius, Trondheim, Norway

I have a remark to make on the dissymmetry of mutual trust. I think that many of you use external examiners, but they don't decide the curriculum, they don't decide what each subject or course should have as its objectives: that's up to the university or school. So I state this only for the sake of discussion. The use of external examiners may be a good starting point for a discussion on how we should draw up our curriculum and maybe change it. But external examiners are not there as a way of recognizing or controlling the curriculum.

Patricia Ruisch, Amsterdam, The Netherlands

My question is perhaps for Gunnar Parelius, in relation to the previous speaker. I was wondering whether centres for architectural education could become centres for lifelong learning. Why should we stop when we have our diplomas and have entered the professional world? Why shouldn't we come back? I'm asking you because you are the only person who mentioned life-long learning, and I was wondering whether in your school there was some thought about having professionals coming in and wanting to know about new architectural ways of thinking, or techniques, or anything else, and not only as examiners?

Gunnar Parelius, Trondheim, Norway

We already offer courses of this kind, called "post-education courses", where professionals can come back to the university and continue their education in certain fields. This relationship between education and the professional body is part of our life-long way of thinking. I would like to add that since Norway is a small country, with few people, the schools and the profession have always been closely linked; but in response to the greater diversity of today's society there has been an initiative from our professional body, which has developed a half-year internship system where students can elect to go out and practice for half a year. This is offered as a means of facilitating the transition from academic training to professional life, because that includes changes like strict time-limits and economy, and they have recognized that need. This initiative is not intended as a means of accreditation on the part of the professional body. Thank you.

Heiner Krumlinde, Bochum, Germany

First of all, I would like to swear to you that there are no German schools with a three-year architecture programme.

To continue: for us, the most important word in the stated theme is the word 'outcomes'. This obviously depends on actual developments, what an architect will be doing once he has finished his studies. When I was just starting out, it was useful to be a school architect because there were a lot of schools to be built. Some years later it was good to be a hospital architect, or an airport architect, but where is the demand today? I think that today the demand is for people who have a lot of specialized computer skills and other competences that are outside our primary disciplines. So while this 'three-plus-two' system is producing the kind of building technician we used to have in Germany, it is only the 'two' part that enables him to be an architect.

I think that what we have forgotten in our meeting is to include someone from the other side. We are all here speaking as architect to architect, so we know everything we can about what the demand for the future will be; but there are surely others – clients, people with a better view of cultural demands, people who are more conscious of the social aspects – who have a broader vision that we have. An architect cannot be the master of all disciplines but he must be able to get into different disciplines, to sustain a dialogue with specialists, to be able to adapt his efforts to changing demands. I think the best way is to help architects become the kind of people who can initiate discussions with specialists from other disciplines.

So in Bochum we have created a Master's in media and management in architecture, for people from different disciplines, with some years of practical experience, who ultimately

will be better equipped to bring architecture to the people and the people's demands to the architect. I think this is a very remarkable point for the future, to ensure a better and more secure position in the future for the architectural profession. The other thing I want to say is that in our opinion the 'generalists' who have chosen their own subjects and specializations are the best basis for future development. It is not good for all schools to be specialized in a very narrow field, producing specialist architects: it is better to have a 'generalist' architect, who is competitive for his region, for his culture and is a modern person. Thank you.

Nicolau Brandao, Porto, Portugal

I would like to make a contribution to the theme of context and the theme of trust. I agree absolutely with what has already been said about it, but the Portuguese situation is even more dramatic. In Portugal less than five percent of building - I will mean the architecture, not the actual construction - is done by architects or even with any input from architects. So the professional organizations are not strong enough to have a social influence. All the professionals want, all the employers want, is someone who doesn't think too much, who isn't too concerned with culture, with education, with aesthetics, or even with human needs. They simply want someone to sign a paper for them and to do what they want done, so that there is no trust at all between the schools and the employers.

Also, strangely enough, we probably have more schools than most other countries in Europe - I think we have twenty-four of them now. Why? Because architecture became a fashion for students. And there are schools that treat it as a business, that produce people to put signatures on pieces of paper for the builders. So this is all very easy, and if we go along in this way with the Bologna Process as they want to, this would be acclaimed in many schools of Portugal. Fortunately the professional bureau that supervises the profession is very suspicious and doesn't trust schools either. But, sometimes, unfortunately, they have to put them all together in the same basket. So we teachers and deans at the older schools, who think in the old way, are being pushed against the wall to some extent, and things are very, very difficult. That is all I want to say for now: I just wanted to remind you that there are some very special situations.

Loughlin Kealy, Dublin, Ireland

The last speaker has raised the question of there not being trust, and certainly, I would think from my own situation that the trust between the general public and the professions is quite often strained. There are plenty of examples of people who have been increasingly prepared to take losses and to challenge pressured decisions in court. I also think that there is increasing evidence that the trust between the general public and academia is also not to be taken for granted. So there is a question, I think, looking at all of this as different relationships, of how one can create a climate where schools are actually free to exercise their expertise and meeting or trying to provide a curricular context that meets the demands that society is making.

I think that this is a serious challenge, whatever the type of society one is living in. I would also take the view that most countries now are going through quite a bit of change - if I was describing the situation in my own country five or six years ago it would be a caricature of what the situation is today - and values change quite quickly and demands for services change quite quickly as well. And that to me means that if one is to be prepared to meet

the legitimate demands that people have, then one has to think a little bit ahead of the situation one finds oneself in now.

Dimitri Kotsakis, Thessaloniki, Greece

A point about life-long learning. There are two paradigms. The first is the computer paradigm, which means hardware education as opposed to software education. The hardware is nursery school, primary school, secondary education and a Bachelor's degree, all of which contribute to creating a person. And then the software is what we call flexible specialization, which changes every four years. So, in a way, it's like drugs: you take something in the university, you get out, and then you come back to the university and take the new brand of it. This, then, is the computer paradigm, so commonly put forward these days. The second is the human paradigm of life-long education, which means two things: there is learning to learn, which starts from a very sound and broad, general, first, deep education, and there is the life-long learning for which you yourself come back on your own responsibility. I just wanted to note these two paradigms of life long learning.

Marvin Malecha, Raleigh, USA

It's always difficult to follow Dimitri, but I'm going to try. The first point that I'd like to comment on is relative to the balance of trust. In the United States I sit on two fairly important panels between educators and practitioners. One is the 'Large Firm Round Table', which is comprised of 35 of the largest architectural firms in the United States and has a history of employing about 75% of the graduates from schools. We meet on a regular basis and discuss what the issues are in their offices versus what the issues are in education; it's actually quite an interesting council.

In fact, at the last 'Round Table', one of the gentlemen from the south offered an interesting proposition on the nature of trust. It's sort of a southern saying so bear with me. It has to do with the nature of breakfast. When the chicken and the pig come to breakfast, he said, the chicken has an involvement, while the pig has a commitment... And, I think, the nature of what happens to many practices is that they see educators as involved with architecture and the practitioners as committed to it on a survival basis, and hence the lack of trust. Now interestingly enough, if you invited one of the better members of the 'Large Firm Round Table' to talk about what they wanted from a graduate, it would not be very different from what Dimitri just articulated. In fact, they don't look for specific software education; they don't look for specific skills, because they all have practices where they do that themselves.

One of the most significant developments happening in the large practices in the United States is that each large office has its own in-house school. I was recently at a presentation of an office by the name of Freeman & White (and by the way they offer many of their courses on their web-site), who had recently received recognition for having the best in-office teaching programme. (They call it the Freeman White Academy.) They spend almost 2 million dollars a year, and they have a curriculum as substantial as many architectural programmes teaching their own employees. And their point is that they want people to come to their office who know how to continue learning, who have an idea about the value of practice, in fact, in many ways very similar to what Dimitri just talked about.

The biggest problem our school has with offices is with the small firms that do not have those capabilities at hand, and who are expecting individuals who can sit down on day one and do what we in the United States call 'billable work'. So this is a difficulty, and it is perhaps one of those areas where we as educators need to respond to domains of knowledge rather than specific issues, so that somebody can leave school at least exposed to domains of knowledge. I realize that this is an American perspective, but how schools involve themselves with how offices are teaching in the office may in fact relieve a lot of these issues. And we have started to build relations with RTKL in Baltimore, with Freeman & White, with SOM, with Genstler, all of which have in-house teaching programmes where they find the involvement of professors with them extremely valuable. So in some ways, what Dimitri is talking about is, in fact, I think, a picture of the future, at least in the United States.

Juhani Katainen, Tampere, Finland

Coming back to the question of trust and the issue of social responsibility, I would like to add one more phrase to the table and that is consumer protection, because although we are not going to deal much with that here, it is heavily used by EU and national legislators in formulating their programmes. I know that it is used a lot in Britain, where you can invoke it as solid grounds for your demands. So this is actually as important a phrase as life-long learning. Thank you.

Herman Neuckermans, Leuven, Belgium

I also want to comment on the problem of trust and distrust, and on the symmetry of distrust. I don't know what the solutions might be, but maybe life-long learning, first as an attitude and then perhaps in practice, by coming back to the schools, could be a start. But I think we should be focusing on the opposite end of the picture, on the secondary schools. In my opinion, every single person should learn something about space and quality of space, because many of these people will become builders, and they should at least be aware of some of the qualities of space.

I can foresee that the secondary schools will say that this is already included in their programme, perhaps in a basic course on the history of architecture, but in most schools this is taught by art historians who only teach the history of styles, and that, for me, is perhaps the weakest point in modern architecture today. I think that the focus should be on quality of space, and that every person should be taught something about it. And while I know that ethical attitudes can change in the course of life, and that we don't give them too much thought, except as we are required by law, but at least we as educators should do what we can, and I think that the forthcoming programme of the EU fortunately focuses on that aspect, not specifically for architecture but on the secondary schools.

Frank Delmule, Ghent, Belgium

I wonder whether, if the community ever stopped wanting architecture, we would stop teaching architecture? I think we form a specific intellectual with a specific dynamic mind, and I think that our schools are a vehicle for realising that.

Loughlin Kealy, Dublin, Ireland

You wouldn't like to risk answering your own question, would you?

Frank Delmule, Ghent, Belgium

I think I answered it within the question... it was a rhetorical question.

No, I think that we can't stop teaching architecture because it's fundamental in a community, but what I see now is that society doesn't really want architecture. Architecture remains in the neighborhood of the community, but not within its heart. And I think that is why that they don't finance it so much, because in effect they don't want it, they just tolerate it. But I think that as schools we don't have to worry about type; we have to continue to form specific intellectual professionals other than doctors and the like. That is what an architect is, a specific mind, a specific dynamic mind, and that is our job.

Per Olaf Fjeld, Oslo, Norway

I think it's important that we don't create this gap between the profession and the educator ourselves. It's a natural, positive gap that will always be there in some way. We can broaden that gap by arguing that it is so difficult, but it is not necessarily so. It is not so difficult if you take away the idea of genius, when you understand that both parts have a limitation, like any other type of profession and to understand that it is a common limitation. I think it is also the essence of a certain type of awareness of what we do. If we are able to state that awareness I think we will also have the capacity to strive for a certain type of precision or a direction.

Richard Foqué, Antwerp, Belgium

I just wanted to make a comment about what Spyros and Marvin were saying. It seems to me that, if you were really honest in trying to see where innovation is taking place in architecture, you would have to admit that it is not in the schools, but in the offices, in practice. This in turn raises the question of research – research bodies, resources, research in design, research bodies on all the things we've been talking about for seven years. But that's the main thing, and you see the same dichotomy in industry. The big innovations in the pharmaceutical sector, for instance, do not take place in the schools or universities, except in some preparatory ways, but in industry.

This is related to what Marvin was saying about the big firms, and although the American situation is different from the European one, since we have much smaller offices, the tendencies are there. You can see the tendencies, and I think that that is something that we should be very aware of. And I support what Per was saying: is it really a problem if there is a difference between education and practice? Maybe it's healthy to have a gap between the two. To be honest I've no answer to that but...

Pierre Von Meiss, Lausanne, Switzerland

I have two or three questions to ask on behalf of my head of department, whom I am replacing. I must admit that they are not on as high a level as the discussion that is taking place, but they are related to it. The first thing he wants to know is how the EAAE participants

deal with the new problem that has emerged with the Bachelor's and Master's system, which is that everyone wants to teach the Master's programme and feel like they are devaluated when they teach in the Bachelor's programme. This is a new problem, which was unexpected, and has nothing to do with the Master's and Bachelor's programmes themselves.

The second thing he would like to know, and this would have to do with some kind of European co-ordination organization, is what weight should be given to studio work as compared to the rest in the ECTS, and whether there is a specific range or bracket upon which we could agree.

The third thing is this: we in Lausanne don't give, and are definitely against giving, credits for internship, practical training, le stage. We are against it because we want it to be something a bit 'wild' in the sense that the school has nothing to say other than checking whether the students have completed it or not, because at this stage these young people are twenty-two years old and have never had to stand on their own feet and have been spoon-fed all through school and university. So we think that it is important for them to suffer in finding a job and to get the job they feel they should have. And if they can't all get into the top firms, then that's another lesson learned, but in any case we don't give them any credit. So these are the three questions, and I don't want to change the direction of the discussion now but maybe after the meeting someone can tell me how they think it should be handled.

Loughlin Kealy, Dublin, Ireland

Would anyone like to respond to that, in terms of just clarifying what the position in your school is in regard to internship?

Aart Oxenaar, Amsterdam, The Netherlands

Let me say this once again, because it always gets misunderstood. Looking just at our school, we do not give points for internships within the normal Master's programme. We have a normal 120 point Master's programme, so I fully agree that within the 3+2 system there is no time for large internships and points as well, so it's something extra we do alongside the regular programme. And in answer to Christian Huetz, it is not a programme driven by practice. On the contrary, it's a very free programme; but there is an influence from practice in the sense that – and what Marvin and others were saying was also along these lines – practicing architects do have the possibility of bringing their research into school, bringing in their innovative work.

In fact, the way the market has been going down in Holland, architects have more time, so we see them coming to us saying they want to do research on specific themes and asking if there is a possibility of doing it in our school. So that's a totally different kind of relation to practice than reserving time within our programme to make them do these specific things that lead to billable hours, to use Marvin's example from the American system. It is a very difficult system, a different system than that.

Christian Huetz, Regensburg, Germany

Just a tiny remark on trust. Trust needs difference. To take a literary example, the one thing you don't trust is the Doppelgänger; they are the most unnerving people you can

meet. And people looking in mirrors thinking that they are geniuses – you really don't trust them. You don't even trust people that are too much like yourself, and so it should be with institutions. There should be a difference, only then can you have trust.

Loughlin Kealy, Dublin, Ireland

OK, I have a sense that we are coming to the end of our discussion here. I have a really stupid question that I would just like to get some of you to respond to. Before you came here there was a list of competences that were selected from a variety of sources. They were put together and you were asked, I suppose, to reflect on them and to give your responses to them. And the people on the panels and from the floor have responded to this list in different ways, some people fairly explicitly, most people not. I would like to ask you whether you think that it is useful for us to try to develop and elaborate this as a basis for discussion. Now would those people who think it is useful mind lifting one hand? OK. Now who thinks that it is of no use whatever? That's a third category... I was just asking something and you didn't hear the question so you're the third category. But I think some people are suggesting that there is some value, but that it needs to be thought about more deeply. Would that be the consensus of your position? Yes? OK, with that very unscientific impression gleaned... Herman, you have one more intervention you want to make? I'm just about to wind up the session now.

Herman Neuckermans, Leuven, Belgium

Just one small comment. I tried to answer the questions, especially the last one, which asked where in the curriculum these competences come up. And that, in my opinion, is a very difficult question, because most of these are attitudes of some kind that are built up all through the curriculum, so you cannot identify them with any one specific course. This is a bit like my objection to the pedagogical units: they are OK for some things, but not for others, and if you have a critical mind you cannot identify them simply with one or another course; they pervade the whole thing, and that makes it difficult. I made diagrams with arrows, which is not the normal way of answering this type of question, but there was a real difficulty here.

Loughlin Kealy, Dublin, Ireland

I agree with you on that, actually. And now I would like to thank the members of the panel, and I would also like to thank you for your questions and your contributions. Thank you very much.



COMMISSION OF THE EUROPEAN COMMUNITIES

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COMMUNICATION FROM THE COMMISSION

The role of the universities in the Europe of knowledge

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1. SUMMARY

This Communication seeks to start a debate on the role of Universities¹ within the knowledge society and economy in Europe and on the conditions under which they will be able to effectively play that role. The knowledge society depends for its growth on the production of new knowledge, its transmission through education and training, its dissemination through information and communication technologies, and on its use through new industrial processes or services. Universities are unique, in that they take part in all these processes, at their core, due to the key role they play in the three fields of research and exploitation of its results, thanks to industrial cooperation and spin-off; education and training, in particular training of researchers; and regional and local development, to which they can contribute significantly.

The European Union therefore needs a healthy and flourishing university world. Europe needs excellence in its universities, to optimise the processes which underpin the knowledge society and meet the target, set out by the European Council in Lisbon, of becoming *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*. The European Council in Barcelona recognised this need for excellence, in its call for European systems of education to become a “world reference” by 2010².

However, the European university world is not trouble-free, and the European universities are not at present globally competitive with those of our major partners, even though they produce high quality scientific publications. The Communication notes a number of areas within which reflection, and often also action, is needed, and raises a series of questions such as:

- how to achieve adequate and sustainable incomes for universities, and to ensure that funds are spent most efficiently;
- how to ensure autonomy and professionalism in academic as well as managerial affairs;
- how to concentrate enough resources on excellence, and create the conditions within which universities can attain and develop excellence;
- how to make universities contribute better to local and regional needs and strategies;

¹ In this Communication, the term “universities” is taken to mean all higher education establishments, including, for example, the “Fachhochschulen”, the “polytechnics” and the “Grandes Ecoles”.

² Barcelona European Council - Presidency Conclusions.

- How to establish closer co-operation between universities and enterprises to ensure better dissemination and exploitation of new knowledge in the economy and society at large
- how to foster, through all of these areas, the coherent, compatible and competitive European higher education area called for by the Bologna Declaration, as well as the European research area set out as an objective for the Union by the Lisbon European Council, in March 2000.

This Communication, which has been prepared in the context of the 2003 Spring European Council, invites responses to these questions from all those concerned with higher education, research and innovation. The Commission will review the state of the debate in the summer of 2003 and identify suitable initiatives, possibly in a further Communication for examination by the Education Ministers in the Education Council and the Research Ministers in the Competitiveness Council, as well as by the European Summit of Higher Education Ministers scheduled for 18-19 September 2003 in Berlin.

2. INTRODUCTION

The creation of a Europe of knowledge has been a prime objective for the European Union since the Lisbon European Council of March 2000. Subsequent European Councils, particularly Stockholm in March 2001 and Barcelona in March 2002, have taken the Lisbon objective further forward.

The Lisbon agenda calls for efforts from a wide range of players. These include the universities, which have a particularly important role to play. This is because of their twofold traditional vocation of research and teaching, their increasing role in the complex process of innovation, along with their other contributions to economic competitiveness and social cohesion, e.g. their role in the life of the community and in regional development.

Given their central role, the creation of a Europe of knowledge is for the universities a source of opportunity, but also of major challenges. Indeed universities go about their business in an increasingly globalised environment which is constantly changing and is characterised by increasing competition to attract and retain outstanding talent, and by the emergence of new requirements for which they have to cater. Yet European universities generally have less to offer and lower financial resources than their equivalents in the other developed countries, particularly the USA. Are they in a position to compete with the best universities in the world and provide a sustainable level of excellence? This question is particularly topical as enlargement draws nearer, considering the frequently difficult circumstances of universities in the accession countries as regards human and financial resources.

To implement the Lisbon agenda, the European Union has embarked upon a series of actions and initiatives in the areas of research and education. One example is the European area of research and innovation, to achieve which fresh perspectives have

just been opened up³ and, in this context, the objective to increase the European research and development drive to 3% of the Union's GDP by 2010⁴.

In the area of education and training, we can mention the achievement of a European area of lifelong learning⁵, the implementation of the detailed work programme on the objectives of education and training systems⁶, work to strengthen the convergence of higher education systems, in line with the Bologna process, and vocational training systems, in line with the Copenhagen declaration.

European universities as such have not recently⁷ been the focus of reflection and debate at European Union level. The Commission seeks to contribute to such a debate, and this Communication accordingly examines the place and role of European universities in society and in the knowledge economy (Section 3), offers some ideas on universities in a European perspective (Section 4) and sets out the main challenges facing the European universities, along with some issues for consideration (Section 5).

The Commission calls upon all players concerned (universities themselves, the rectors' conferences, national and regional public authorities, the research community, students, business and the people of Europe) to make known their comments, suggestions and points of view on the various aspects addressed by this Communication⁸. In the light of the contributions the Commission receives from this consultation, it will determine future action and whether to submit a follow-up communication for the Education Ministers (in the Education Council) and the Research Ministers (in the Competitiveness Council), as well as to the European Summit of Higher Education Ministers scheduled for 18-19 September 2003 in Berlin as part of the Bologna process.

3. THE EUROPEAN UNIVERSITIES TODAY

3.1. The universities at the heart of the Europe of knowledge

The knowledge economy and society stem from the combination of four interdependent elements: the production of knowledge, mainly through scientific research; its transmission through education and training; its dissemination through the information and communication technologies; its use in technological innovation. At the same time, new configurations of production, transmission and application of knowledge are emerging, and their effect is to involve a greater number of players, typically in an increasingly internationalised network-driven context.

³ European Commission, Communications "Towards a European research area", COM (2000) 6 of 18.1.2000 and "The European research area: providing new momentum", COM (2002) 565 of 16.10.2002.

⁴ European Commission, Communication "More research for Europe/towards 3% of GDP", COM (2002) 499 of 11.9.2002.

⁵ European Commission, Communication "Making a European area of lifelong learning a reality", COM (2001) 678 of 21.10.2001.

⁶ Detailed work programme on the follow-up of the objectives of education and training systems in Europe, OJ C 142 of 14.06.2002, p. 1.

⁷ European Commission, Memorandum on higher education in the European Community, COM (1991) 349 of 5.11.1991.

⁸ See Section 7 "How to make a contribution".

Given that they are situated at the crossroads of research, education and innovation, universities in many respects hold the key to the knowledge economy and society. Indeed, universities employ 34% of the total number of researchers in Europe, although national figures vary in the ratio of one to three between Member States (26% in Germany, 55% in Spain and over 70% in Greece). They are also responsible for 80% of the fundamental research pursued in Europe.

In addition, universities train an ever increasing number of students with increasingly higher qualifications, and thus contribute to strengthening the competitiveness of the European economy: one third of Europeans today work in highly knowledge-intensive sectors (over 40% in countries like Denmark and Sweden), which have on their own accounted for half the new jobs created between 1999 and 2000).

Universities also contribute to the other objectives of the Lisbon strategy, particularly employment and social cohesion, and to the improvement of the general level of education in Europe. Many more young Europeans have a higher education qualification today than in previous generations. While some 20% of Europeans aged between 35 and 39 hold such qualifications, this figure is a mere 12.5% for the 55-59 age group. If we look at the total population aged 25-64, the rate of employment of persons holding higher education qualifications (ISCED 5 and 6) stood at 84% in 2001, i.e. almost 15 points above the average taking all education levels together, and nearly 30 points more than people having completed only lower secondary level (ISCED 0 to 2). Finally, the rate of unemployment amongst those holding higher education qualifications stood at 3.9% in 2001, one third of that of persons with a low level of qualifications.

3.2. The European university landscape

There are some 3 300 higher education establishments in the European Union, approximately 4 000 in Europe as a whole, including the other countries of Western Europe and the candidate countries⁹. They take in an increasing number of students, over 12.5 million in 2000, compared with fewer than 9 million ten years previously.

The European university landscape is primarily organised at national and regional levels and is characterised by a high degree of heterogeneity which is reflected in organisation, governance and operating conditions, including the status and conditions of employment and recruitment of teaching staff and researchers. This heterogeneity can be seen between countries, because of cultural and legislative differences, but also within each country, as not all universities have the same vocation and do not react in the same way and at the same pace to the changes which affect them. The structural reforms inspired by the Bologna process constitute an effort to organise that diversity within a more coherent and compatible European framework, which is a condition for the readability, and hence the competitiveness, of European universities both within Europe itself and in the whole world.

European universities have for long modelled themselves along the lines of some major models, particularly the ideal model of university envisaged nearly two

⁹ By way of comparison, there are over 4 000 higher education establishments in the USA, 550 of them issuing doctorates, and 125 identified as "research universities". Of these, some 50 account for the lion's share of American academic research capacity, public funding in support of university research and the country's Nobel prizes for science.

centuries ago by Wilhelm von Humboldt in his reform of the German university, which sets research at the heart of university activity and indeed makes it the basis of teaching. Today the trend is away from these models, and towards greater differentiation. This results in the emergence of more specialised institutions concentrating on a core of specific competences when it comes to research and teaching and/or on certain dimensions of their activities, e.g. their integration within a strategy of regional development through adult education/training.

3.3. The new challenges facing European universities

All over the world, but particularly in Europe, universities face an imperative need to adapt and adjust to a whole series of profound changes. These changes fall into five major categories.

Increased demand for higher education

This will continue in the years ahead¹⁰, spurred on simultaneously by the objective of certain countries of increasing the number of students in higher education¹¹ and by new needs stemming from lifelong learning. This increase, which Europe's low birth rates are not expected to slow down in any great measure, will further intensify capacity saturation in the universities.

How can this increasing demand be met, considering the limited human resources (which can be expected to become a deficit, both as regards teaching staff and as regards researchers, in the years ahead) and the limited financial capacity (which does not keep in step with requirements)? How can sustainable funding of universities, constantly beleaguered as they are by fresh challenges, be ensured? It is crucially important to maintain and strengthen the excellence of teaching and research, without compromising the level of quality offered, while still ensuring broad, fair and democratic access.

The internationalisation of education and research

The momentum of internationalisation is considerably speeded up by the new information and communication technologies. The result is increased competition. Competition between universities and between countries, but also between universities and other institutions, particularly public research laboratories (where research staff are not expected to meet simultaneous teaching commitments), or private teaching institutions, often specialised and sometimes run on a profit-making basis. An increasing share of the funds allocated to the universities is distributed on a competitive basis and this means ever keener competition to attract and keep the best talent.

Be that as it may, European universities are attracting fewer students and in particular fewer researchers from other countries than their American counterparts. The former in 2000 attracted some 450 000 students from other countries, while the

¹⁰ European Commission, Joint Research Centre, Report on "The future of education between now and 2010", June 1999.

¹¹ Countries such as the United Kingdom and Denmark have set a target of training 50% of a given age group at university level between now and 2010.

latter attracted over 540 000¹², mostly from Asia¹³. More significantly, the USA in proportion attracts many more students from other countries at advanced levels in engineering, mathematics and informatics, and are successful in keeping more persons with doctorate qualifications: some 50% of Europeans who obtained their qualifications in the USA stay there for several years, and many of them remain permanently.

European universities in fact offer researchers and students a less attractive environment. This is partly due to the fact that they often do not have the necessary critical mass, which prompts them to opt for collaborative approaches, e.g. creation of networks, joint courses or diplomas. But other factors, outside the university, play also an important role, e.g. the rigidities of the labour market or lower entrepreneurship entailing fewer employment opportunities in innovative sectors. This is reflected in lower performances in e.g. research funding, links to industry, patenting rates and spin-off creating rates than in the USA and Japan¹⁴.

To develop effective and close co-operation between universities and industry

Co-operation between universities and industry needs to be intensified at national and regional level, as well as geared more effectively towards innovation, the start-up of new companies and, more generally, the transfer and dissemination of knowledge. From a competitiveness perspective it is vital that knowledge flows from universities into business and society. The two main mechanisms through which the knowledge and expertise possessed and developed by universities can flow directly to industry are the licensing of university intellectual property, and spin-off and start-up companies.

Although little data is currently available in Member States on the extent to which universities are commercialising their research, so that it is difficult to say how well universities across the European Union are exploiting research results with the enterprise sector, some data are available through the "Community Innovation Survey" (CIS). The CIS asks enterprises, inter alia, about the most important sources of information for innovation. The results¹⁵ show that education-related and public research sources are ranked very low. Less than 5% of innovative companies considered information from government or private non-profit research institutes, and from universities or other higher education establishments, as being a very important source of information.

It would facilitate the dissemination of knowledge into the EU industrial fabric, including SMEs in traditional sectors, if universities were actively to pursue the promotion of effective university-industry relationships, and better to exploit the results of their knowledge in relationships with industry. Evaluation criteria for the performance of universities' could take account of this challenge.

¹² European Commission, DG RTD, Key Figures 2002 (based on OECD and Eurostat data)

¹³ Students from four Asian countries (China, India, Japan and South Korea) on their own accounted for nearly 40% of the total of foreign students in the USA (Open Doors 2001, IIE, New York).

¹⁴ European Commission, Communications "Towards a European research area", COM (2000) 6 of 18.1.2000 and "The European research area: providing new momentum", COM (2002) 565 of 16.10.2002.

¹⁵ "Statistics on Innovation in Europe" Data 1996-97, EUROSTAT

The European Commission will continue to analyse the existing barriers and factors conducive to this co-operation and will disseminate the results widely to interested circles.

The proliferation of places where knowledge is produced

This development and the increasing tendency of the business sector to subcontract their research activities to the best universities mean that universities have to operate in an increasingly competitive environment. The result that is on top of the traditional links between the universities of a given region and the businesses in the surrounding area new relations have appeared in the picture. Geographical proximity is no longer the main basis for selecting a partner. High-tech businesses, for their part, tend to set up near the best-performing universities. The shortening of the time lag between discoveries and their application and marketing raises the question of the role and the contribution of universities to the process of technological innovation and the links between them and the business sector.

The reorganisation of knowledge

This is to be seen in particular in two trends which pull in opposite directions. On the one hand, we have the increasing diversification and specialisation of knowledge, and the emergence of research and teaching specialities which are increasingly specific and at the cutting edge. On the other, we see the academic world having an urgent need to adapt to the interdisciplinary character of the fields opened up by society's major problems such as sustainable development, the new medical scourges, risk management, etc. Yet the activities of the universities, particularly when it comes to teaching, tend to remain organised, and more often than not compartmentalised, within the traditional disciplinary framework.

The reorganisation of knowledge can also be seen in a certain blurring of the borders between fundamental research and applied research. This does not go so far as totally to remove the meaning of the difference between, on the one hand, the pursuit of knowledge essentially for its own sake, and on the other its development with a view to specific objectives, particularly the conversion of existing knowledge into products, processes and technologies.

Fundamental research therefore remains a major area for university research activity. It is this capacity in the big American research universities that makes them attractive partners for industry, which in turn provides them with substantial funding for it. Fundamental research in this context is therefore conducted with its application very much in mind, but at the same time without losing its fundamental character. In Europe, universities tend to undertake directly applied research for the business sector, extending even to the provision of scientific services, which if taken to excess could endanger their capacity to contribute to the progress of knowledge.

The emergence of new expectations

Alongside its fundamental mission of initial training, universities must cater for new needs in education and training stemming from the knowledge-based economy and society. These include an increasing need for scientific and technical education, horizontal skills, and opportunities for lifelong learning, which require greater permeability between the components and the levels of the education and training

systems. European universities are directly concerned by scientific education, in particular because they train science teachers for secondary education. In addition, the contribution expected of universities to lifelong learning strategies leads them gradually to widen the conditions of access to this area of tuition (in particular to allow access to those not coming through the route of upper secondary education, through better recognition of skills acquired outside university and outside formal education); to open up more to industry; to improve student services; and to diversify their range of training provision in terms of target groups, content and methods¹⁶.

The growth of the knowledge economy and society also leaves universities to become more closely involved in community life. Alongside and as a natural result of the exercise of its fundamental missions to produce and transmit knowledge, the university today functions particularly as a major source of expertise in numerous areas. It can and must increasingly become a forum of reflection on knowledge, as well as of debate and dialogue between scientists and people.

Given that they live thanks to substantial public and private funding, and that the knowledge they produce and transmit has a major impact on the economy and society, universities are also accountable for the way they operate and manage their activities and budgets to their sponsors and to the public. This leads to increasing pressure to incorporate representatives of the non-academic world within universities' management and governance structures.

4. WHAT IS AT STAKE FOR EUROPE

4.1. Universities and the European dimension

Responsibilities for universities lie essentially in the Member States at national or regional level. The most important challenges facing the universities, by contrast, are European, and even international or global. Excellence today is no longer produced or measured at the national level, even in the biggest European countries, but at the level of the European or world community of teachers and researchers.

The question arises in this context as to the compatibility and the transparency of the systems whereby qualifications are recognised (which lies at the core of the Bologna process of convergence), and that of the obstacles to the mobility of teachers and researchers¹⁷ in Europe. Student mobility, for instance, is still marginal in Europe. In 2000, a mere 2.3% of European students were pursuing their studies in another European country¹⁸ and while the mobility of researchers is higher than that of the average of the population concerned, it is still lower than it is in the USA. The divergence between the organisation of universities at Member State level and the emergence of challenges which go beyond national frontiers has grown over the past few years and will continue to do so, as a result of a combination of factors:

¹⁶ European Commission, Communication "Making a European area of lifelong learning a reality", COM (2001) 678 of 21.10.2001.

¹⁷ Strategies in favour of Mobility within the European Research Area, Communication from the Commission, COM(2001) 331 final of 26 June 2001.

¹⁸ This low average masks substantial disparity across the Member States. For instance, 68% of Luxembourgish students, 10% of Greek students and 9% of Irish students were studying outside their own country. Conversely, only 0.7% of UK students and 1.2% of Spanish students went to study beyond their own borders.

- the emergence of a true European labour market in which the people of Europe must be free to move around as they wish¹⁹ and in which problems concerning the recognition of qualifications become a thing of the past;
- the expectations with regard to recognition which have been created by action taken by the European Union itself to encourage mobility, particularly through the ERASMUS initiative;
- the emergence of a globalised provision of a wide range of university courses, the continuing brain drain leading to the loss of top-level students and researchers, and a continuing comparatively low level of activity by European universities at the international level;
- the worsening of these factors which will come with the enlargement of the Union, owing to the greater level of heterogeneity of the European university landscape which will ensue.

The nature and scale of the challenges linked to the future of the universities mean that these issues have to be addressed at European level. More specifically, they require a joint and coordinated endeavour by the Member States and the candidate countries, backed up and supported by the European Union, in order to help to move towards a genuine Europe of knowledge.

4.2. European Union action for the universities

Support is available to universities from a variety of Community initiatives in the areas of research and education. On the research front, they receive around one third of the funding under the framework programme for technological research and development, and particularly the support actions for research training and mobility (Marie Curie actions).

The advantages of the Framework Programme for the universities should further increase with the Sixth Framework Programme²⁰ with the stepping up of training and mobility support actions, the introduction of a support structure for the creation of young teams with a potential for excellence, and the increased focus that will be placed on fundamental research within “networks of excellence” or “integrated projects”²¹, and particularly as part of action to promote research “at the frontiers of knowledge” (NEST action).

The universities also have a major role to play in initiatives under the “Science and Society” action plan²², designed to foster the development and improve the coordination of national activities and policies in areas such as scientific opinion and dialogue with the people, ethics, science education, and “women and science”.

¹⁹ In this connection, the European Commission has submitted an action plan on skills and mobility, COM(2002)72 of 13.2.2002.

²⁰ Decision of the Council and of the European Parliament 1513/2002 in OJ L 232 of 29.8.2002, p. 1.

²¹ The “networks of excellence” are an instrument of integration of European research capacity designed to further knowledge, the “integrated projects” a tool for conducting research targeting a specific objective. Both are designed to gather a critical mass of resources and are used in the seven “priority thematic areas” under the sixth Framework Programme.

²² European Commission, Communication “Science and Society Action Plan”, COM (2001) 714 of 4.12.2001.

Universities are also involved in certain of the actions pursued by the Union relating to technological innovation, e.g. the support actions for utilising R&D results achieved by science parks, through the Framework Programme or with the support of the Structural Funds or the European Investment Bank (EIB).

As far as education and training are concerned, universities are very much involved in all the actions of the SOCRATES programme, particularly the ERASMUS action. Since it was launched, over a million students have benefited from this action and every year some 12 000 teachers opt for ERASMUS mobility. Many thematic inter-university networks also contribute to strengthen cooperation at European level, acting as a think tank for the future or the development of their subject area. The Community has provided support for the European course credit transfer system (ECTS) for the recognition of periods of study. The LEONARDO programme provides support for mobility projects between universities and the business sector, involving 40 000 people between 1995 and 1999. Universities are also involved in the *eEurope* initiative and its *eEurope* 2005 Action Plan, which encourages all universities to develop on-line access ("virtual campus") for students and researchers²³.

This cooperation also extends to other regions of the world. Most of the Community research Framework Programme is open to every country in the world and in particular provides support for cooperation with the countries with the Mediterranean region, Russia and the Newly Independent States, as well as developing countries. Through the TEMPUS programme the Union supports university cooperation with the countries of the former Soviet Union, southeast Europe and, since its extension in 2002, the Mediterranean region. There are also initiatives covering relations with other geographical areas, e.g. ALFA and Asia-Link. All these activities help to project the European academic universe around the world. It is also worth mentioning the proposal for the "Erasmus World" programme, which will enable the Union to support "European masters" in order to attract to Europe some of the world's best students for studies pursued in at least two European countries.

Lastly, the Commission supports and helps to foster the Bologna process which is designed to create between now and 2010 a European higher education area which is consistent, compatible and competitive, through reforms which converge around certain defining objectives.

5. MAKING EUROPEAN UNIVERSITIES A WORLD REFERENCE

If they are to play their full role in the creation of a Europe of knowledge, European universities must, with the help of the Member States and in a European context, rise to a number of challenges. They can only release their potential by undergoing the radical changes needed to make the European system a genuine world reference. There are three objectives to be pursued simultaneously:

- ensuring that European universities have sufficient and sustainable resources and use them efficiently;

²³

The *eEurope* Action Plan - Designing tomorrow's education, Communication from the Commission, COM(2001)172 final, 28 March 2001.

- consolidating their excellence in research and in teaching, particularly through networking;
- opening up universities to a greater extent to the outside and increasing their international attractiveness.

5.1. Ensuring that the European universities have sufficient and sustainable resources

Insufficient means

On average the Member States spend 5% of their GDP on public expenditure for education in general. This figure is comparable to that of the USA and higher than Japan's (3.5%). Public expenditure, however, has not increased with GDP in recent years in Europe, and has even dropped in the past decade. Total expenditure on higher education alone has not in any member state increased in proportion to the growth in the number of students. A substantial gap has opened up with the USA: 1.1% of GDP for the Union compared with 2.3%, i.e. more than double, for the USA. This gap stems primarily from the low level of private funding of higher education in Europe. This stands at a meagre 0.2% of European GDP compared with 0.6% in Japan and 1.2% in the USA.

American universities have far more substantial means than those of European universities — on average, two to five times higher per student. The resources brought by the students themselves, including by the many foreign students, partly explain this gap. But American universities benefit both from a high level of public funding, including through research and defence credits, and from substantial private funding, particularly for fundamental research, provided by the business sector and foundations. The big private research universities also often have considerable wealth, built up over time through private donations, particularly those from graduate associations.

The worsening under-funding of European universities jeopardises their capacity to keep and attract the best talent, and to strengthen the excellence of their research and teaching activities²⁴. Given that it is highly unlikely that additional public funding can alone make up the growing shortfall, ways have to be found of increasing and diversifying universities' income. The Commission plans to conduct a study on the funding of European universities, in order to examine the main trends in this area and identify examples of best practice.

At the March 2002 Barcelona European Council, the Union set as its target to increase Europe's research effort to 3% of its GDP²⁵. This implies a special effort as regards human resources for research.

²⁴ The Commission sets out ideas for consideration and discussion on the matter of university funding in its Communications "Investing efficiently in education and training: an imperative for Europe" (COM(2002)779 of 10 January 2003) and "More research for Europe: towards 3% of GDP" (COM(2002) 499 of 11.9.2002).

²⁵ European Commission, Communication "More research for Europe: towards 3% of GDP", COM (2002) 499 of 11.9.2002.

5.1.1. *Increasing and diversifying universities' income*

Four main sources of university income can be identified:

- Public funding for research and teaching in general, including research contracts awarded on a competitive basis: this is traditionally the main source of funding for European universities. However, given the budgetary situation in the Member States and the candidate countries, there is a limited margin of manoeuvre for increasing public support. And while the Member States did in Lisbon in March 2000 give a commitment to substantially increase human resource investment, it is highly unlikely that this effort alone can cover the anticipated increase in the number of students or make it possible to catch up with the USA.
- As is the case in the USA, private donations can prove a substantial source of income for universities. However, this solution comes up against a whole range of problems in Europe, particularly the low fiscal attractiveness of private donations, and the status of the universities, which does not always allow them to amass private funds and wealth. These problems also explain, at least in part, the absence of a philanthropic tradition on the scale of that to be found in the USA, where former students often remain linked to their universities long after they have qualified.
- The universities can also generate income by selling services (including research services and flexible lifelong learning possibilities), particularly to the business sector, and from using research results. But these sources do not today contribute in any substantial way to the funding of European universities, partly because of a regulatory framework which does not allow them to really take advantage of their research activities, or does not encourage them to do so, e.g. because the royalties are paid to the state and not to the university or the researchers themselves.
- Lastly, contributions from students, in the form of tuition and enrolment fees. In Europe, these contributions are generally limited or even prohibited, in order to allow democratic access to higher education.

Questions for the debate

- How can adequate public funding of universities be secured, given the budgetary constraints and the need to ensure democratic access?
- How can private donations be made more attractive, particularly from a tax and legal point of view?
- How can universities be given the necessary flexibility to allow them to take greater advantage of the booming market in services?

5.1.2. *Using the available financial resources more effectively*

Universities must use the limited financial resources they have as efficiently as possible. They have a duty to their “stakeholders”: the students they train, the public authorities that provide their funding, the labour market which uses the qualifications

and skills they transmit and society as a whole, for whom they fulfil important functions related to economic and social life. The objective must be to maximise the social return of the investment represented by this funding. There are many signs²⁶ which show that it is not currently used in the most efficient way.

- A high dropout rate among students, standing at an average of around 40% in the Union. The “education for everybody” approach in higher education has resulted in huge expansion of the student population, with no fundamental change in university structures and living conditions. In most Member States, a successful secondary school career gives automatic right of access to university studies with no additional selection. This right is considered as an essential element of democracy to guarantee equality for all citizens. Many students thus embark upon higher education without any real academic vocation and do not get what they need from university training. In certain Member States, the universities themselves apply selection systems, in particular certain subject areas²⁷ sometimes apply additional selection criteria.
- A mismatch between the supply of qualifications (which is shaped by a medium-term perspective, as a result of the duration of studies) and the demand (which often reflects very short term needs and is more volatile) for qualified people, which may result in particular lasting deficits in certain broad types of qualifications, especially in the area of science and technology. University training in fact does not only affect the people who benefit from it: society at large must endeavour to optimise the social return on the investment represented by the studies it pays for. A mismatch between the qualifications offered and those requested is thus an illustration of non-optimum use of resources.
- The duration of studies for a specific qualification can vary in the ratio of one to two in Europe. This explains the huge disparities in the total cost of a student calculated on the basis of an average number of years of study. In Germany, for instance, it usually takes five to six years to train a civil engineer and this training is totally funded from the public purse. In the United Kingdom, it takes up only three years of university studies paid for from public funds, followed by three to five years of training in a company, this training attested to by a state-recognised exam — all paid by the employer, and backed up by on-the-job experience. These differences in duration, even between countries which mutually recognise their qualifications, are striking when one considers that there is widespread support for the Bologna process which is designed to create a European area of higher education by 2010. The difference in cost for the public purse prompts scrutiny of what constitutes optimum use of resources.
- In the same line of thinking, the disparity of status and conditions of recruitment and work for researchers at the pre and post-doctoral levels in Europe is not conducive to the best allocation possible of the means granted to them.

²⁶ These are analysed in detail in the Communication “Investing efficiently in education and training: an imperative for Europe”.

²⁷ Particularly medicine and veterinary science.

- Europe also suffers from the lack of a transparent system for calculating the cost of research in European universities. This is because of the disparity, the opacity and complexity of the accounting systems used. This prompted the high level group of Commission advisers on research (EURAB, European Research Advisory Board) to suggest the development of a simple and transparent accounting system to calculate the real cost of research and to allow comparisons.

Questions for the debate:

- How can the maintenance of democratic access to higher education be combined with a reduction in failure and dropout rates among students?
- How can a better match be achieved between supply of and demand for university qualifications on the labour market, through better guidance?
- Is there a case for levelling out the duration of courses for identical qualifications?
- How can the transparency of research costs in the universities be enhanced?

5.1.3. Applying scientific research results more effectively

Application of research and insufficient creation of spin-off companies

The universities are one of the primary sources of new knowledge and as such play an ever stronger part in the process of technological innovation. But they do not do so in Europe to the extent they could and should. Since the mid-1990s, the number of young technological (“spin-off”) companies created by universities has been on the rise in Europe, particularly around certain of them. Their average density nevertheless is far smaller than it is around the American campuses. Fewer companies are set up in Europe by researchers or in association with them, and those created in Europe tend to grow less quickly and not to last as long.

A major obstacle to better application of university research results is the way intellectual property issues are handled in Europe. In the USA, the “Bayh-Dole” Law has given organisations in which research is conducted using federal funds, particularly the universities, ownership of their results in order to encourage application of academic research results. In recent years, in Europe, several national legislations have converged towards solutions of the Bayh-Dole Act type, and other Member States where provisions of this type have not yet been adopted are about to do so. The actual effect of these measures cannot yet be evaluated. However, the divergences which continue in relation to the provisions enforced in certain Member States, and the national nature of the regulations concerned, have in Europe complicated and limited the transfer of technology and transnational cooperation. More broadly, while the Community patent opens up opportunities for European scale application, it is a matter which is still under discussion.

In addition, European universities do not have well-developed structures for managing research results. They are less well developed, for instance, than those of public research bodies. Another contributory factor is the lack of familiarity of many university staff with the economic realities of research, particularly the managerial

aspects and issues regarding intellectual property. The idea of applying research results is moreover still looked upon with distrust by many researchers and university leaders, particularly because of the delicate balance to be struck between the requirements of economic use on the one hand, and on the other the need to preserve, in the common interest, the autonomy of universities and freedom of access to knowledge.

Questions for the debate:

- How could it be made easier for universities and researchers to set up companies to apply the results of their research and to reap the benefits?
- Is there a way of encouraging the universities and researchers to identify, manage and make best use of the commercial potential of their research?
- What are the obstacles which today limit the realisation of this potential, whether legislative in nature or as regards intellectual property rights? How can they be overcome, particularly in countries where the university is funded almost exclusively from the public purse?

5.2. Consolidating the excellence of European universities

5.2.1. Creating the right conditions for achieving excellence

If Europe is to have and to develop real excellence within its universities, a number of conditions need to be in place. Some of these exist already in some Member States; and the list itself does not claim to be all-inclusive. Nonetheless, it sets out a reference for the debate. As with many other areas mentioned in this Communication, these issues need to be tackled within the structures of the universities themselves, as well as within the structure of regulation within which they operate. However, if this is not done in a convergent and coherent manner across Europe these efforts will lose much of their value. The aim must be to bring all universities to the peak of their potential, not to leave some behind; and piecemeal implementation of these issues will reduce the momentum of the university world in Europe generally. Such a convergent process would also, as with the structural reforms that have followed the Bologna Declaration, provide a supporting context within which Member States could achieve such change.

Need for long term planning and financing.

The precondition for the development and support of excellence is a context in which long-term planning is possible. Excellence does not grow overnight. Building up a reputation for excellence in any discipline (or sub-discipline) takes years, and is dependent on the critical attitude of peers, measured not country-wide, but Europe-wide and indeed world-wide. Accumulating the intellectual capital represented by effective and world-class teams of researchers, led by the best combination of vision and doggedness, and operated by individuals whose contributions complement each other in the best way, takes a long time and requires that worldwide recruitment to teams be possible.

And yet governments, which are still the major paymasters of universities, budget on an annual basis, and have difficulties in looking beyond a limited number of years.

Although a number of Member States have moved to multi-annual contracts with universities, the time period involved rarely exceeds 4 years. Equally, at the end of the four-year period elections may have intervened, the position of the government may have changed, the objectives sought previously may have diminished in importance or, in extreme cases, been discarded.

Member States thus need a general consensus within political and civil society as to the contribution which excellence in research and in universities makes, and the need to enable it. Such consensus should seek in part to insulate the research sector from the hazards of changing financial circumstances, insofar as this is possible. The period within which universities should be enabled to plan, to develop their own strategies, and to exercise the autonomy suggested in Section 5.1 above, could rise to 6 or even 8 years where possible.

Need for efficient management structures and practices.

A second condition is that the governing structures of a university must respond both to the varied needs of that institution and to the expectations of society - those who provide its core funding. That implies that they should have an effective decision-making process, a developed administrative and financial management capacity, and the ability to match rewards to performance. Equally, the system should be designed with issues of accountability clearly in mind. Managing a modern university is a complex business, and one which should be open to professionals from outside the purely academic tradition, provided that confidence in the university's management remains strong. It should also be said that freedom of funding will of itself change the financial culture of a university; but it will not by itself increase the quality of that management.

Need to develop interdisciplinary capability.

A third condition needed for excellence is that universities be enabled, and encouraged, to develop more work falling between the disciplines. As has been noted above (Section 3.3), advanced research increasingly falls outside the confines of single disciplines, partly because problems may be more complex, more because our perception of them has advanced, and we are more aware of the different specialisations required to examine different facets of the same problem.

Organising work on an inter-disciplinary basis requires that universities have flexibility in their organisation, so that individuals from different departments can share their knowledge and work together, including through the use of ICT. It also requires flexibility in the way careers are evaluated and rewarded, so that inter-disciplinary work is not penalised for being outside normal departmental frames. Finally, it requires that departments themselves should accept "cross-border" work as contributing to faculty-wide objectives.

Questions for the debate:

- How can the consensus be strengthened around the need to promote excellence in the universities in conditions which make it possible to combine autonomy and management efficiency?
- Is there a way of encouraging the universities to manage themselves as efficiently as possible while taking due account simultaneously of their own requirements and the legitimate expectations of society in their regard?
- What are the steps which would make it possible to encourage an interdisciplinary approach in university work, and who should take them?

5.2.2. *Developing European centres and networks of excellence*

A combination of the absolute need for excellence, the effects of the precariousness of resources and the pressure of competition, forces universities and Member States to make choices. They need to identify the areas in which different universities have attained, or can reasonably be expected to attain, the excellence judged to be essential at European or at international level – and to focus on them funds to support academic research. This type of policy would make it possible to obtain appropriate quality at national level in certain areas, while ensuring excellence at the European level, as no Member State is capable of achieving excellence in all areas.

As to which areas should be given preference, this should be based on an evaluation within each university system. If it is to be objective and reflect the perception of the European and international scientific and academic community, this evaluation should be carried out by panels including people from outside the national system concerned. The academic excellence to be evaluated could in fact include that of other universities with which the institutions examined are associated through transnational cooperation arrangements. The choice of areas and institutions should be reviewed regularly, in order to ensure that excellence is maintained and to allow new teams of researchers to show their potential.

The concentration of research funding on a smaller number of areas and institutions should lead to increased specialisation of the universities, in line with the move currently observed towards a European university area which is more differentiated and in which the universities tend to focus on the aspects situated at the core of their research and/or teaching skills. While the link between research and teaching naturally continues to define the ethos of the university as an institution and while training through research must remain an essential aspect of its activity, this link is nevertheless not the same in all institutions, for all programmes or for all levels.

The support for excellence and its dissemination, particularly academic excellence is a key principle of the Sixth Community Framework Research Programme. Through this programme's "networks of excellence" the Union is endeavouring to foster the building up of "virtual" capacity for excellence which has the critical mass needed and is, whenever possible, multi-disciplinary.

Questions for the debate:

- How can providers of university funds be encouraged to concentrate their efforts on excellence, particularly in the area of research, so as to attain a European critical mass which can remain competitive in the international league?
- How should this excellence be organised and disseminated, whilst managing the impact of the steps taken on all institutions and research teams?
- How can the European Union contribute more and better to the development and maintenance of academic excellence in Europe?

5.2.3. Excellence in human resources

In order to maintain its position and strengthen its role internationally, the Union needs a pool of top-level researchers/teachers, engineers and technicians. The university remains the focal point for training such people. In terms of quantity, the Union is in the paradoxical situation of producing slightly more scientific and technical graduates than the USA, while having fewer researchers than the other major technological powers. The explanation for this apparent paradox lies in the smaller number of research posts open to scientific graduates in Europe, particularly in the private sector: 50% only of European researchers work in the business sector, compared with 83% of American researchers and 66% of Japanese researchers.

The situation in Europe could well get worse in the years ahead. The absence of career prospects will alienate young people from scientific and technical studies, while science graduates will look to other more lucrative careers. Furthermore, around one third of the current European researchers will retire over the next 10 years. As the situation is similar in the United States, the competition between universities internationally is set to become even keener.

One way of stemming this trend would be to increase the number of women in scientific and technical careers, where they are substantially under-represented, particularly at the top end of the ladder. On average, in the countries of the Union, there are two to four times more men than women graduates in the sciences. Also, women represent only a quarter to a third of laboratory research personnel in Europe. Action is being taken under the "women and science" initiative²⁸, to encourage women to participate in the European research drive, by pinpointing the obstacles to their presence and generally applying the most effective steps taken by Member States to remove these obstacles.

Another solution would be to enhance the pool of resources by strengthening not only intra-European academic mobility, but also mobility between university and

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ETAN working party report "Science policies in the European Union: promoting excellence through mainstreaming gender equality", 1999; Resolution of the European Parliament on Women and Science of 3 February 2000 (EP 284.656); Commission working document "Women and science: the gender dimension as a leverage for reforming science" SEC (2001) 771 of 15 May 2001; Council Resolution on science and society and on women in science of 26 June 2001; OJ C 199, p.1 of 14.7.2001; Report by the Helsinki Group on Women and Science "National policies on women and science in Europe" – March 2002.

industry. In this context virtual mobility based on the use of ICT has also an important role to play.

Although the situation has improved slightly in the wake of initiatives taken in a number of Member States, European universities continue essentially to recruit people from the country or region in which they are established, or even within the institution itself. Furthermore, the evaluation of researchers is based on criteria which neither stress the advantages of nor encourage periods in other European universities.

In this context there is also the core issue of recognition of studies and qualifications at European level. Not having a quick, simple system of recognition for academic or professional purposes is today a major obstacle to research and mobility — and therefore to a greater cross-fertilisation of ideas and research between European universities, and to their wider influence. Specific instruments (such as ECTS, the Diploma Supplement, NARICs, Community directives) have been developed and almost all Member States and candidate countries have invested in quality assurance systems which are networked within the ENQA (European Network for Quality Assurance). It is urgent to examine whether and how a solution could be found (within the framework of the Bologna process for greater transparency and compatibility) to the problem of recognition, which is currently preventing the universities from using their potential and resources efficiently and limiting their wider audience.

In qualitative terms, excellence in human resources depends largely on available financial resources, but is also affected by working conditions and career prospects. Generally speaking, career prospects in European universities, characterised by the multiplicity of configurations, are limited and shrouded in uncertainty. The Commission supports the Bologna process, including its extension to doctorate level training, and is interested to note the experiments in progress on dual doctorates or doctorates under joint supervision. It also stresses the need to train prospective doctorate candidates to a greater extent in an interdisciplinary work perspective.

European universities also offer fewer possibilities at post-doctorate level than their American counterparts. There would be a case for expanding the range of opportunities for holders of doctorates outside research careers.

The Union has pursued a number of initiatives to encourage and facilitate research and mobility in Europe. Under the project on the European Research Area, it has defined a strategy to foster research and mobility through a range of tangible measures. Moreover, the Commission will shortly submit a Communication on the matter of scientific careers.

Questions for the debate:

- What steps could be taken to make scientific and technical studies and careers more attractive, and to strengthen the presence of women in research?
- How — and by whom — should the lack of career development opportunities following doctoral studies be addressed in Europe, and how could the independence of researchers in carrying out their tasks be fostered? What efforts could universities make in this regard, taking particular account of the needs of Europe as a whole?

- What ways are there of helping European universities to gain access to a pool of resources (students, teachers and researchers) having a European dimension, by removing obstacles to mobility?

5.3. Broadening the perspective of European universities

5.3.1. *A broader international perspective*

European universities are functioning in an increasingly “globalised” environment and find themselves competing with universities of the other continents, particularly American universities, when it comes to attracting and keeping the best talent from all over the world. While European universities host only slightly fewer foreign students than American universities, in proportion they attract fewer top-level students and a smaller proportion of researchers.

All in all, the environment offered by the European universities is less attractive. Financial, material and working conditions are not as good; the financial benefits of the use of research results are smaller and career prospects are poorer²⁹; there is also the inappropriate and poorly harmonised nature of arrangements with regard to visas and residence permits for students, teachers and researchers from other countries — be they from the Union or from other countries in the world. Several Member States have recently taken steps to enhance the attraction of their universities, their laboratories and their businesses for top-level researchers and students and qualified workers from third countries, e.g. through “scientific visas”.

Similarly, the Commission has submitted a proposal for a Council directive on the conditions of entry and residence of students from third countries. A parallel initiative for researchers from these countries is expected in 2003. The Union will also step up support to enhance the attractiveness of European universities through action to support mobility under the Sixth Framework Programme, which will enable over 400 researchers and doctoral students from third countries to come to European universities between 2003 and 2006, and under the “Erasmus World” initiative.

Questions for the debate:

- How can European universities be made more attractive to the best students and researchers from all over the world?
- In a context of increasing internationalisation of teaching and research, and of accreditation for professional purposes, how should the structures, study programmes and management methods of European universities be changed to help them retain or recover their competitiveness?

5.3.2. *Local and regional development*

There are universities throughout the Union's regions. Their activities often permeate the local economic, social and cultural environment. This helps to make them an instrument of regional development and of strengthening European cohesion. The development of technology centres and science parks, the proliferation of regional

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See also Section 5.1.3 on the management of intellectual property.

cooperation structures between the business sector and the universities, the expansion of university regional development strategies, the regional networking of universities, are all illustrations of this dimension of university activity.

The regional dimension of the university activity is thus set to get stronger, given its essential role in achieving the Europe of knowledge, particularly looking ahead to enlargement. The European Union supports these developments, particularly through the Structural Funds and the Sixth Framework Programme.

In addition, the role played by the universities as a source of expertise and a catalyst for multiple partnerships between economic and social players within a range of networks is very relevant at the regional and local levels.

The increased involvement of the universities locally and regionally should not, however, overshadow a more outward-looking international perspective and a constant endeavour to improve their excellence in research and education. These remain essential and will indeed enable the universities to make a more effective contribution to the development of their local and regional environment.

Questions for the debate:

- In what areas and how could the universities contribute more to local and regional development?
- What ways are there of strengthening the development of centres of knowledge bringing together at regional level the various players involved in the production and transfer of knowledge?
- How can greater account be taken of the regional dimension in European research, education and training projects and programmes?

6. CONCLUSION

This Communication makes a number of points which reflect the profound changes taking place in the European university world. After remaining a comparatively isolated universe for a very long period, both in relation to society and to the rest of the world, with funding guaranteed and a status protected by respect for their autonomy, European universities have gone through the second half of the 20th-century without really calling into question the role or the nature of what they should be contributing to society.

The changes they are undergoing today and which have intensified over the past ten years prompt the fundamental question: can the European universities, as they are and are organised now, hope in the future to retain their place in society and in the world?

If it is to achieve its ambition of becoming the world's most competitive and dynamic knowledge-based economy and society, Europe simply must have a first-class university system -- with universities recognised internationally as the best in the various fields of activities and areas in which they are involved.

The questions raised in this document are intended to help in determining what action should be taken for a move in this direction within the enlarged EU.

All interested parties -- institutions, public authorities, individuals or representative associations -- are therefore urged to give their points of view on this subject, and describe their experiences and their "best practices".

7. HOW TO CONTRIBUTE?

The Commission intends to review the contributions it has received up to the end of May 2003.

These contributions can be sent to either of the following two dedicated e-mail addresses:

- eac-consult-univ@cec.eu.int
- rtd-consult-univ@cec.eu.int

They can also be sent by physical mail to:

European Commission
EAC A1 (Consult-Univ)
(B7 – 9/58)
B - 1049 BRUXELLES



COMMISSION OF THE EUROPEAN COMMUNITIES

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COMMUNICATION FROM THE COMMISSION

**THE NEW GENERATION OF COMMUNITY EDUCATION AND TRAINING
PROGRAMMES AFTER 2006**

COMMUNICATION FROM THE COMMISSION

THE NEW GENERATION OF COMMUNITY EDUCATION AND TRAINING PROGRAMMES AFTER 2006

EXECUTIVE SUMMARY

This Communication follows up the Commission's proposal for the budgetary means and policy priorities for the period 2007-2013. It describes the Commission's intentions for a new generation of Community programmes for mobility and co-operation in education and training to replace the Socrates, Leonardo da Vinci and Tempus III programmes when they expire at the end of 2006. It shows how the new generation will contribute to the Commission's priorities for the period to 2013, in particular to achieving sustainable development within the European Union and stability and prosperity in the neighbouring countries.

The new generation will consist of:

- a new Integrated Programme for mobility and co-operation in lifelong learning for the EU Member States, the EEA/EFTA countries and the candidate countries, covering education and training together; and
- a new Tempus Plus programme for cooperation between Member States and countries bordering the Union and the existing Tempus countries, covering the whole spectrum of education and training.

The new programmes will respond to important policy developments in the field at European level that have taken place since the existing programme generation was created in the late 1990s. The Lisbon European Council of 2000 set the core goal of making Europe the most competitive knowledge-based economy in the world by 2010, while nonetheless strengthening social cohesion, and accorded education and training a central role in reaching this aim. The intergovernmental processes launched at Bologna and Copenhagen seek to improve coherence, quality and transferability in higher education and in vocational training, and explicitly acknowledge the important role the Community programmes will play in making them a success. In 2003, the Commission launched a "New Neighbourhood" strategy to reinforce the prosperity, stability and security of the countries bordering the enlarged European Union. All these major policy developments, and the other factors set out in the body of the Communication, need to be reflected in the design of the new programmes.

In line with the growing importance of cooperation in education and training, and in response to massive unfulfilled demand, the new generation of internal and external programmes will be significantly more ambitious than at present, as the Commission's new financial perspectives proposal makes clear. The Integrated Programme for lifelong learning would see a very significant increase in decentralised mobility actions for individual citizens and in partnerships between institutions. Its targets would include:

- At least 10% of school pupils and teachers involved in Comenius 2007-13.
- At least 3 million Erasmus students by 2010.
- At least 150,000 Leonardo trainee placements per year by 2013.
- At least 50,000 adults learning and teaching abroad per year by 2013 and the participation of at least one in five structured adult education providers in European cooperation by the end of the programme.

The Integrated Programme will be divided into four sectoral programmes: Comenius for school education; Erasmus for all forms of learning at university level; Leonardo da Vinci for initial and continuing vocational education and training; and Grundtvig for adult education. In order to reinforce synergies between education and training, and to address policy priorities and dissemination needs better, the Integrated Programme will contain a transversal programme, focusing on policy development (including data collection and analysis), language learning, new information and communication technologies (ICT), and dissemination. This will permit a more strategic and coordinated approach than in the current programmes.

The Integrated Programme will also include a new Jean Monnet programme, focusing on European integration. It will encompass the current Jean Monnet Action, to promote university teaching of and research into European integration, as well as support to important European organisations and associations in the field of education and training.

The new Tempus Plus programme will build on the successful Tempus approach, which has hitherto been limited to higher education and has led to system development and reinforced cooperation between Member States and partner countries. Tempus Plus would extend such action across the spectrum of lifelong learning: to schools, to vocational education and training, and to adult education. The programme will consist of measures to support system modernisation, to fund the mobility of individuals, and to support multilateral projects. The programme target would be:

- To support the mobility of at least 100,000 individuals by 2013.

The Commission's detailed legislative proposal for the new programmes outlined in this Communication will be published in summer 2004, as part of a wide-ranging package of draft legislation for the next programming period.

INTRODUCTION

The existing Community programmes in the field of mobility and co-operation in education and training all come to an end in 2006¹. The Commission will later this year adopt its detailed legislative proposals for a new generation of programmes to run concurrently with the new financial perspective. This Communication sets out, in the light of the Commission's recently-published Communication *Building our Common Future: Policy challenges and Budgetary Means of the Enlarged Union 2007-2013*², the rationale behind the Commission's forthcoming legislative proposals, how they build on the experience of the past, their main features, and the broad use of the funds proposed in that Communication. This paper outlines the key contribution that organised European cooperation in education and training will make to achieving the Commission's priorities for the new expenditure period, in particular to sustainable development to bring the European Union to the leading edge in the knowledge economy and society, and to help reinforce stable and prosperous relations with our neighbouring countries. Nothing in this Communication prejudices the final content of the legislative proposals to be adopted by the Commission, including their financial aspects.

This Communication covers activities both within the European Union and candidate countries, and external activities involving the "New Neighbourhood" countries and other third countries currently covered by Tempus III. It is divided into six parts.

- The first part sets out the main political and policy developments that have taken place in co-operation in education and training since the adoption of the current generation of Community programmes in 1999/2000, which affect the design of the new generation of programmes.
- The second part outlines the continuing and growing need for Community action in the fields of education and training, both within and outside the EU.
- The third part covers the experience of the programmes as such, focusing on the interim evaluations of the current programmes and the public consultation on their future development.
- The fourth part describes the new internal programme proposal - an "Integrated Programme" for mobility and co-operation in lifelong learning bringing education and training activities together - and details its main features and planned outputs.
- The fifth part explains the new external programme proposal, the main orientations adopted by the Commission, and the key features of the new Tempus Plus programme and its planned outputs.
- The sixth part outlines how the new programme proposals contribute to the Commission's aim of simplifying instruments to improve delivery.

¹ Decision No 382/1999/EC of the Council (OJ L 146 of 11.6.1999) (Leonardo da Vinci); Decision No 253/2000/EC of the Parliament and the Council (OJ L 28 of 3.2.2000) (Socrates); Decision No 1999/311/EC of the Council (OJ L 120 of 8.5.1999) (Tempus).

² COM(2004) 101.

PART I – THE POLITICAL CONTEXT

The Lisbon process

- 1.1 Europe has accepted the challenges of the knowledge society. High-quality education and training systems are an essential and indispensable pre-requisite for a competitive knowledge-based society. Globalisation and technological and demographic change mean that skills must be constantly updated if the Community is to remain competitive on a world-wide level, and if citizens are to avoid unemployment and ensuing social exclusion. The modernisation of the Community's education and training systems has consequently been identified by the Lisbon European Council, and by subsequent European Councils, as a centrepiece of the Community strategy, most recently in Brussels in October 2003. From Lisbon onwards, Community education and training policy has gained a dynamic hitherto unknown: it has an essential contribution to make to achieving the goal of making Europe the most competitive knowledge-based economy in the world by 2010 with more and better jobs and greater social cohesion.
- 1.2 The European Employment Strategy (EES) has a key role to play in this process, alongside research and innovation and the development of a more inclusive society and policies for sustainable growth. The contribution of the EES to the development of active labour market policies and to the employment-related aspects of education and training has been considerable. It is sustained in particular through the European Social Fund (ESF) which, as the third Cohesion Report³ points out, represented one third of Structural Fund expenditure during the period 1994-1999. During the 2000-2006 programming period, the link between the EES and the ESF has been strengthened, and the ESF, with a budget of EUR 60 billion, is the main means of supporting the policy framework which the EES provides.

The Objectives Process – improving European education and training systems

- 1.3 The period since the decisive Lisbon summit has seen a number of significant developments in education and training at EU level. For the first time, substantial political cooperation is taking place at European level in these areas, and there is an effort to integrate all initiatives into coherent education and training policies at European and national levels. Reforms are being made to policies and structures, leading to their convergence on the main EU goals. Serious attention is being paid not only to intra-European aspects of these policies, but also to the place of European education and training in the world.
- 1.4 The Council submitted a report in Spring 2001 on the concrete objectives of education and training systems, which identified three main goals for 2010: increasing the quality of education and training provided in Europe; improving access to education and training at all stages of life; and opening up the education and training systems to the wider world, so as to enable them better to prepare people for future life. These three main goals have been sub-divided into 13 more detailed objectives - ranging from improving teacher and trainer education to increasing the attractiveness of learning, and from making best use of resources to promoting cooperation and mobility. Linked to this is a new process to identify and collect

³ *A new partnership for cohesion: convergence, competitiveness, cooperation*, COM(2004) 107.

indicators in order to measure progress towards the various agreed objectives. The Commission has identified 29 such indicators, and the Council in May 2003 agreed five European benchmarks for progress towards the 2010 goals.

Lifelong learning

- 1.5 At the same time, the concept of lifelong learning itself has been highlighted and developed at European level, notably at the European Councils in Lisbon and Feira. Following extensive consultation on a Commission Memorandum, strong consensus was reached on a new paradigm of learning which places the learner at the centre of the learning process and emphasises the importance of equal opportunities and the quality and relevance of available learning. The definition extends from pre-school to post-retirement, and encompasses the spectrum of formal, non-formal and informal learning. Active citizenship, personal fulfilment and social inclusion, as well as the employment-related aspects of employability and adaptability, are mutually supporting aims.
- 1.6 The Joint Interim Report to the Spring 2004 European Council, which was agreed at the Education Council on 26 February 2004, invites all Member States to put in place coherent and comprehensive national lifelong learning strategies by 2006. These strategies should promote more effective partnerships between key actors including business, the social partners and education institutions at all levels; validation of prior learning in order to motivate people to learn; and the creation of learning environments that are open, attractive and accessible to everyone, especially to disadvantaged groups.

A changing world of higher education – the Bologna process

- 1.7 The university world is changing rapidly under the combined pressures of the new demands of the knowledge society in current and new Member States, an increasingly global research community and ever-rising national targets for participation in higher education. These targets are not generally matched by proportionate increases in resources for teaching or for research, and therefore imply changes in the organisation and balance of work done within universities. At the same time, Member States are increasingly concerned about ways of improving the quality and relevance of teaching and research within higher education, and with its efficiency and governance. Higher education systems and institutions are less and less “protected” behind national borders and increasingly open to competition and pressures from beyond them.⁴
- 1.8 The creation of a coherent, compatible and attractive European higher education area in accordance with the Bologna declaration of 1999 is the main structural means of meeting these challenges and has increasingly involved the Community in recent years. The goals of the Bologna declaration mirror in many ways the objectives of the Union’s own programmes in the field of higher education, including at doctoral level, so a closer association is natural and necessary. This is evident in fields such as quality assurance, the European Credit Transfer System (ECTS), the promotion of mobility and the European dimension of education.

⁴

For a fuller analysis see the Communication from the Commission, *The role of universities in the Europe of Knowledge*, COM(2003) 58 final.

Enhancing the quality and attractiveness of vocational education and training - the Copenhagen process

- 1.9 In response to a request from the Barcelona European Council for action in the field of vocational training similar to that under the Bologna declaration, the Council in November 2002 published a resolution on increased cooperation on vocational training. This led to the adoption by Ministers from 31 countries, the European social partners and the Commission, of the “Copenhagen Declaration”, an agreement to develop enhanced European cooperation in a number of areas of vocational education and training. These include transparency of qualifications and competences, quality assurance, credit transfer, common principles for the validation of non-formal and informal learning and lifelong guidance.
- 1.10 Significant progress has been made at European level in implementing the Copenhagen declaration. The Commission adopted a proposal for a new Europass single framework for transparency of qualifications and competences in December 2003⁵. A Common Quality Assurance Framework, including a common core of quality criteria and a coherent set of indicators has been developed. In addition, the foundations of a credit transfer system for vocational education and training have been laid.

A changing Union with new borders

- 1.11 Education and training policies do not operate in isolation. They also have a role to play in developing links with our neighbours. Relations with the countries bordering the enlarged Europe are crucial. In its Communication on Wider Europe the Commission stated, “The EU has a duty, not only towards its citizens and those of the new member states, but also towards its present and future neighbours to ensure continuing social cohesion and economic dynamism. The EU must act to promote the regional and sub-regional cooperation and integration that are preconditions for political stability, economic development and the reduction of poverty and social divisions in our shared environment”⁶. Deepening and widening cooperation in the fields of education and training are an essential part of that duty.

PART II – THE NEED FOR COMMUNITY ACTION

- 2.1 It is in the light of these major policy ambitions and advances that the future need for Community action must be assessed. The largest single market in the world will never become the basis for the most competitive knowledge-based society if serious further efforts are not made to remove incompatibilities and incoherence between what, following enlargement, are 25 different education and training systems, where qualifications and skills are not recognised across borders and where methodological excellence in one country remains unknown in others. The necessary complement to the single market and the common currency is a workforce empowered to make use of professional and geographical mobility. What is needed is a coherent strategy, whereby Member States learn from each other. This does not imply that the Union

⁵ COM(2003) 796 final.

⁶ COM(2003) 104 final, p. 3. The countries covered by this policy are: in the Southern Mediterranean: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestinian Authority, Syria, Tunisia; and Russia and the Western Newly Independent States (Ukraine, Moldova, Belarus).

needs to take responsibility for running education and training systems; on the contrary, full responsibility for the organisation, content and financing of education and training must remain within the Member States. In this, they will have the full support of the Structural Funds, particularly in less-developed regions, which are the main Community financial instruments in this field. In this context, the ESF will provide support for improving the quality and responsiveness of education and training systems, as well as for investing in human capital. Member States will also be able to take advantage of the next generation of Community Initiatives.

- 2.2 The Structural Funds operate through authorities designated by Member States. However, action more directly supported by the EU can also complement activities throughout Member States in the field of education and training, and can achieve results only available through Community action and at Community level. Enabling the mobility not only of students, trainees, adult learners, teachers, trainers, and academics, but also of practices and ideas, is an important area where Member States' own actions will not produce the necessary results; and it is crucial to the development of the knowledge society, since it entails the direct transmission and experience of new approaches and skills and, equally importantly, promotes networks of institutions that co-operate at a European level.
- 2.3 The importance of mobility and of partnerships in this context is sometimes underestimated. Trans-national comparison at system level is a highly effective means of promoting change; the debate around the PISA results is a case in point. Exchange and mobility actions have a similar effect, but on individuals, and from the grass-roots upwards. Exchanges, mobility and trans-national partnerships bring participants to confront what others do, and can do, and to look at their own performance in a new light. In this respect, exchange and mobility provide a response to one of the key challenges facing education and training systems: how to motivate learning facilitators to review and up-grade their professional practice and to cope with the increasing demands made of them.
- 2.4 It is this trans-national and individual element which distinguishes the impact of the education and training programmes from the many actions to improve quality in the field undertaken nationally, some of which are also supported by the Union through the Structural Funds. These actions, often excellent in their design and delivery, generally remain within a national or regional context; so the element of outside and individual comparison often does not arise in the same way⁷. Research into the impact of transnational exchanges confirms this. Indeed, Erasmus students say overall that their exchange experience has been the most significant new experience in their lives. In this sense, the education and training programmes are agents of change and modernisation within the education and training systems of the Union.
- 2.5 Education and training cooperation is not just an internal matter for the EU. The external dimension, famously encapsulated in the Tempus programme and recently extended through Erasmus Mundus, addresses an equally important and distinct set of needs. Cooperation in education and training is a very powerful instrument at the

⁷ The Interreg Community initiative is a notable exception. It aims to strengthen economic and social cohesion throughout the Union by fostering the balanced development of the continent through cross-border, transnational and inter-regional cooperation. This cooperation can be in education and training, depending on the needs expressed by the regions concerned.

service of strengthening relations with third countries and for fostering mutual understanding between EU countries and those beyond our borders, particularly but not exclusively those forming the “new neighbourhood” countries adjoining the enlarged Union. For this reason alone it is essential to reinforce our activities in this sphere in the future. But the benefits extend further. The evaluations of Tempus have shown that cooperation in education and training is key for the transition of countries that may become candidate countries in the short term. And the benefits do not flow all in one direction. It is essential that our systems become more and more open to the rest of the world, that we are able to learn from and absorb excellent practice wherever it is found, if the EU is to achieve the goal set at the 2002 Barcelona European Council of becoming a world quality reference in education and training.

- 2.6 It is for these reasons that the Commission believes it is essential to continue with the internal and external Community cooperation programmes in education and training in the coming years, to integrate them under the unifying principle of lifelong learning, and indeed to expand their volume and scope significantly, as explained in Parts Four and Five of this Communication.
- 2.7 The new programme framework for Community action in education and training must also respond to a range of political, social, economic and cultural factors. These challenges are not specific to education and training; and in some cases other instruments – in particular those of the Employment and Cohesion policies – have the financial leadership. However, cooperation in the field of education and training at European level has a unique and valuable contribution to make.

Mobility

- 2.8 The transnational mobility of people is beneficial to Europe as a whole. It enriches national cultures, and enhances the cultural, educational and professional experience of those taking part. Such experience is increasingly necessary given current limited employment prospects and a labour market which requires more flexibility and greater adaptability to change. And, as outlined above, mobility is a significant factor leading to system change through direct shared experience. In recognition of its growing importance, the Parliament and Council adopted in 2001 a Recommendation on facilitating the mobility of all those in education and training⁸. The Commission considers that the new programme generation will be one of the most important instruments for enhancing the volume and quality of transnational mobility, and therefore will make the action a strong part of its legislative proposals.

Language Learning

- 2.9 Following the European Year of Languages in 2001, the Commission organised a public consultation “Promoting language learning and linguistic diversity”, on the basis of which it presented an action plan on language learning⁹. This concentrates on three main areas: extending the benefits of life-long language learning to all citizens, improving language teaching, and creating a more language-friendly environment. The Union, by its trans-national and multi-lingual nature, is looked to by its citizens as a promoter (and indeed guarantor) of linguistic diversity.

⁸ OJ L 215 of 9.8.2001.

⁹ COM(2003) 449 final.

Information and Communication Technologies

- 2.10 The Community has supported the development of pedagogy linked to information and communication technologies over many years and in a number of ways, most recently through the Minerva action of Socrates and the adoption of the eLearning programme¹⁰. As the effect of the information and communication revolution spreads across society, it will become increasingly important for all citizens, without exception, to be comfortable with the use of these technologies.

Social changes

The Commission's Third Cohesion Report has identified a number of challenges for the enlarged Union. As concerns investment in people and human capital in particular, the Report highlights the need to concentrate Cohesion interventions and other Community instruments - such as Community programmes for co-operation and mobility in the field of education and training - on the four main areas below

An ageing society means longer to learn

- 2.11 The ageing of society continues. The demographic pyramid of the European Union is increasingly top-heavy, as survival rates rise and pension and health-care burdens grow accordingly. This issue has been addressed in the 2003 Employment Guidelines¹¹, which invite Member States to develop policies for active ageing, as well as setting a specific target for the employment rate of older workers.

A rapidly evolving labour market

- 2.12 Globalisation and the new knowledge-driven economy have brought about dramatic and rapid changes in the European labour market. As the Employment Guidelines and the Broad Economic Policy Guidelines¹² recommend, our education and training systems must provide the European labour force with the necessary skills to cope with changes. European programmes can significantly contribute to this process, both by providing citizens with an opportunity to upgrade and acquire new skills through periods of study and training abroad, and by promoting quality and adaptation to the new requirements of education and training systems through a process of cooperation and exchange of good practice.

A more diverse society

- 2.13 Societies within the EU continue to become more culturally diverse and more interlinked with others, as a result of globalisation and new communication technologies on the one hand, and the impact of the European single market and migration on the other. This puts a premium on the development of intercultural understanding and respect, and on the inculcation and reinforcement of habits of active citizenship. At the same time, there is an increasing need to deepen understanding among our citizens of the nature of European identity.

¹⁰ Decision No 2318/2003/EC of the Parliament and the Council, OJ L 345 of 31.12.2003.

¹¹ COM(2003) 170 final.

¹² Decision No 578/2003/EC of the Council, OJ L 197 of 5.8.2003.

Contributing to social inclusion

- 2.14 Initial education is the gateway to future life chances. Special attention must be paid to making sure that negative initial experiences with formal education do not lead people to turn their backs on learning for the rest of their lives. On the contrary, every effort must be made to provide those who have left education without basic qualifications with alternative “second chance” opportunities for access to education and training suited to their needs. For this to be a success, innovative pedagogical approaches will be needed, as well as specialised guidance facilities, links with local enterprises and other measures designed to create a motivating learning environment within which second chance education can develop its full potential.

External developments in Education and Training*Higher education – Tempus and Erasmus Mundus*

- 2.15 Community policy for countries outside the European Union has focused for more than a decade through the Tempus programme on higher education institutions and systems, on the grounds that they are of particular importance for the social and economic transition process as well as for cultural development. They are also pools of expertise and of human resources and provide for the training of new generations of political, administrative and business leaders. Initially designed for countries emerging from Communism (including most of the current accession countries), the programme has been extended at various stages to include the ex-Soviet Union countries, the Western Balkan countries, and the Mediterranean countries. It currently operates in 27 countries, stretching from Mongolia to Morocco.
- 2.16 Although the Tempus programme is fundamentally geared toward assisting partner countries, the programme also gives Member States better access to areas of knowledge where the highest level of development has been reached outside the Union and creates enduring and mutually-beneficial partnerships.
- 2.17 Tempus has been the flagship education programme for exchanges with countries outside the EU and its EFTA/EEA and candidate country partners. But it has not been the only one. In 1995, specific agreements for exchanges in higher education were made with the United States of America and with Canada, and the Commission itself has launched other programmes, based on the experience of the major internal programmes, with Latin America (ALFA and ALBan), and with Asian countries (Asia-Link), as well as pilots with Japan, Australia, and New Zealand.
- 2.18 There has recently been increasing recognition of the importance of higher education as a vector of internationalisation, and thereby of economic growth and development. Universities have found themselves in tougher competition for the best talent, particularly in research; and this competition is not limited to the EU but is world-wide. The Erasmus Mundus programme¹³ will promote European Masters’ courses, operated by multinational consortia of universities, with an associated programme of student scholarships aimed at the best students from the rest of the world. It represents a first response from the Union to this phenomenon.

¹³ Decision No 2317/2003/EC of the Parliament and the Council, OJ L 345 of 31.12.2003.

Future needs

- 2.19 The complex of factors underlying the Union's cooperation policy with its near neighbours (and the other countries associated in the Tempus programme) may be summarised as follows:
- Education and training are key developmental factors for our near neighbours and our partners. It is in Europe's interest to promote the democracy, prosperity and stability which growth alone can ensure. In this respect, cooperation in education and training has an important part to play in the Union's development assistance.
 - The "people-to-people" contacts forming part of the external dimension of education and training are increasingly understood as contributing to intercultural dialogue, and, through their influence on systems, have a greater impact than a simple head-count might suggest. They also provide the Union with a valuable instrument of cultural diplomacy which creates a wider understanding of the specificities of our own culture and heritage and is sought after by partner countries as a means of enriching their own education and training provision.
 - Contacts with education and training systems in partner countries through exchange and cooperation programmes develop synergies and convergence with systems within the Union, and thus increase their attractiveness to partner countries.
- 2.20 The Tempus programme has proved its value in contributing to the modernisation of the higher education systems in partner countries, in fostering closer links between EU countries and those outside the Union, and in preparing countries for candidate status. It is a powerful instrument that has great potential for expansion. It has shown that education systems in the EU (and those who run them) have both the capacity and the willingness to help their counterparts develop their own systems.
- 2.21 However, although the contribution of higher education to growth is significant, in countries with a lower overall level of economic development, improving basic education and vocational education and training are necessary complements. Higher education alone will not affect all citizens, and can only play a limited part in helping the overall development of a country and its people and in nurturing its constructive relationship with the Union. The enlargement of the EU fundamentally alters the political, geographic and economic weight of the EU in the world and in the surrounding regions, and correspondingly demands a policy towards Europe's new neighbours which deepens and widens cooperation in education and training. If the Union's ambitions are high, as the Commission believes they should be, then the Union must be prepared to go beyond higher education, and to reach out to the education and training systems overall, since it is only in this way that maximum impact can be achieved. This implies that we should develop Tempus beyond higher education so that it contributes to improving all the elements in the lifelong learning process – from schools through vocational education and training to university and adult education.

PART III – THE EXPERIENCE OF THE PROGRAMMES

Experience of Socrates and Leonardo da Vinci – Interim evaluations

- 3.1 The Commission has drawn on a substantial bank of experience of programmes in education and training. The most recent and most significant input is the interim evaluation reports on the current phases of Socrates and Leonardo da Vinci, which were published in March 2004¹⁴. The main messages are:
- The coverage and focus of the programme actions are generally regarded as valuable and appropriate.
 - The administrative and financial procedures have improved since the first phase, but are still perceived as disproportionately burdensome and slow. Similarly, some selection procedures¹⁵ need an overhaul.
 - There is a need for more synergy and coherence between actions and programmes.
 - Good results under the programmes are not well disseminated.
 - There is a need for stronger links between the programmes and policy developments.
 - Excessive detail in the current programme legislations causes problems of implementation.

Experience of Tempus III – Interim evaluation

- 3.2 The main messages to emerge from the Tempus interim evaluation report¹⁶ are the following:
- Tempus has been adapted well to changing geo-political and socio-economic conditions in Europe and in the Tempus partner countries over the past ten years.
 - Formidable socio-economic development challenges remain and reinforce the case for giving priority to training and higher education reforms.
 - More emphasis is needed on mobility, dissemination of outputs and outcomes, dialogue with national authorities, and more effective structural intervention in the field of higher education.
 - The programme's re-orientation towards a more strategic approach increased its impact on legislation in the partner countries and led to greater openness and preparedness for international cooperation in these countries.

¹⁴ COM(2004) 153 and COM(2004) 152.

¹⁵ In particular, the Leonardo da Vinci "B" procedure.

¹⁶ COM(2004) 157.

Public consultation on the future development of the programmes

3.3 In the light of the policy developments set out above, the Commission conducted between November 2002 and March 2003 a wide consultation of all those involved in or with an interest in the education, training and youth programmes. A detailed report has been compiled for the Commission by the *Pôle Universitaire de Nancy-Metz* and can be read on-line¹⁷. The main outcomes are:

- Great enthusiasm for the programmes, in particular for mobility measures.
- A belief that the programmes should contribute to the development of the European dimension and European citizenship and to the teaching of languages, and strong expressions of interest in the regional dimension of the actions of the programmes.
- A very strong feeling that the programmes are bureaucratic, inflexible, and over-complicated, particularly in regard to the very small amount of most grants.
- A view that decentralised procedures (those handled via National Agencies within the participating countries) are simpler and more user-friendly than those handled directly by the Commission.

PART IV – INTERNAL POLICY: THE INTEGRATED PROGRAMME FOR MOBILITY AND CO-OPERATION IN LIFELONG LEARNING

Orientations for the new generation of programmes

4.1 The Commission has considered the various elements set out above, in the light of the policy mandate given by successive European Councils, of its own policy reflections and of its experience of current and previous programmes, and proposes:

- To retain at this stage separate programmes targeting the EU¹⁸ on the one hand, and neighbouring countries on the other. This architecture is judged to take best account of the fact that the type and purpose of activities in education and training cooperation are, as analysed above, different in nature in these different contexts.
- In the light of the ever-increasing integration between education and training actions and institutions across the EU, and of the emergence of the lifelong learning paradigm, there are major benefits to be gained from bringing together the fields covered by the Socrates and Leonardo da Vinci programmes into a single structure. Such a combined programme could better support policy developments in the participating countries, respond more effectively to the needs of its users, and permit simplification and efficiency gains at the level of programme implementation, particularly in areas that currently cross the divide between education and training. The Commission will therefore propose an “Integrated Programme”, covering both education and training within the EU.

¹⁷ Available at http://europa.eu.int/comm/dgs/education_culture.

¹⁸ Including EEA/EFTA and candidate countries once the appropriate agreements are concluded.

- Within this Integrated Programme, the importance of education and training to the achievement of the Lisbon goal, the emergence of the Bologna and Copenhagen processes, the objectives process, and the related policy developments outlined earlier, all demonstrate the need for clearer instruments to support policy development. Other related policy initiatives at Community level (eg, the eLearning programme or the Europass initiative) should also be incorporated. Finally, the Commission sees advantage in bringing the Jean Monnet Action into the broad structure offered by the Integrated Programme, together with support for key European-level institutions in the field such as the European University Institute (Florence) and the College of Europe (Bruges and Natolin), in order to place the funding of these activities and institutions on a firmer and more strategic footing than hitherto, and to permit synergies between these actions in the field of European integration and cooperation in education and training more generally.
- In order for European cooperation in education and training to play its full part, and to respond to the increasing importance of the field in every Member State and at European level, the Commission will propose a much more substantial programme for the next programming period. The bulk of the increase occurs in the decentralised actions of the programme, principally in the area of transnational mobility for individual citizens, where applications are made directly to designated National Agencies in each country, which have the detailed knowledge of the national circumstances and how best to meet the needs of the individual programme users.
- Over the next programming period, the annual budget for the proposed Integrated Programme could increase by four times compared to the current level. Funding at this level would permit the achievement of a set of ambitious but realistic targets, commensurate with the political importance of the new programme. These are explained in paragraphs 4.4 to 4.7 below.
- The programme should be simplified and made more flexible. The new programme legislation should limit itself to the fields of activity and the generic types of action to be supported, with much of the detailed implementation arrangements to be set out in the programme guidelines agreed with the programme Committee.
- There should also be as much commonality as possible between the constituent programmes. Every programme within the integrated framework will draw from the same set of generic actions (mobility, projects, networks, etc), which should allow for more consistency and transferability between them. In place of the current complex of programme committees and sub-committees, there will be a single programme Committee, which will meet in different formations (eg, schools, VET) as appropriate. Each formation will wield the full range of powers, which will eliminate the delay currently caused by the obligation to refer some matters to several committees successively.
- The Integrated Programme will be open to the participation of all those countries currently involved in Socrates and Leonardo, and may be extended to

Switzerland and the Western Balkans¹⁹. Further important flexibility will be the use of up to 1% of the programme budget to fund the involvement of institutions from non-participating countries, where this adds value to the activity in question. This is a major advance on the current generation, where a feeble EUR 250,000 is available in each programme to fund such action, and the procedures for implementing it are so burdensome that it has never been used in Leonardo.

The design of the programme

- 4.2 The Integrated Programme will contain four separate sectoral programmes: for school education (Comenius), for higher education (Erasmus), for initial and continuing vocational education and training (Leonardo da Vinci), and for adult education (Grundtvig). Their coverage will be based on the existing programmes, but with some adjustments. In addition to the four sectoral programmes, there will be two horizontal programmes. The “transversal programme” will cover the cross-cutting issues: support for policy development; language learning; new information and communication technologies; and dissemination and exploitation of results. The Jean Monnet Programme will support a range of institutions and activities focused on European integration: the Jean Monnet Action itself, provision of operating grants for a set of key institutions, and operating grants for European associations active in the fields of education and training.

Integrated Programme			
Comenius School education	Erasmus Higher education & advanced training	Leonardo da Vinci Initial and continuing vocational education and training	Grundtvig Adult education
Transversal programme 4 key activities – Policy development; Language learning; ICT; Dissemination			
Jean Monnet programme 3 key activities – Jean Monnet Action; European Institutions; European Associations			

- 4.3 A major difference between the current generation and the Integrated Programme would be the scale of the activity. The Commission would propose a very substantial increase in the decentralised actions, particularly mobility and partnerships, in order to reach a number of numerical objectives set out below. In all programmes this would represent a step-change from the current level of activity. Such a proposal would attribute a level of resource that is appropriate to the stated ambitions²⁰ and growing political importance of this type of action, and responds to massive

¹⁹ The Tempus Plus programme will contribute to preparing the countries of the Western Balkans for subsequent participation in the Integrated Programme.

²⁰ The existing Socrates Decision already includes the target of reaching 10% of university students and 10% of school pupils, but the resources allocated to the programme are far too low to permit these objectives to be achieved. The current level of activity represents some 2-3% of the school pupil population and 3-4% of the university student population.

unfulfilled demand among European citizens. It is clear that such a substantial increase in the decentralised actions would require reinforcement of the network of National Agencies charged with implementing them. The Commission would therefore plan to increase the level of support it grants to these agencies.

The four sectoral programmes – Comenius, Erasmus, Leonardo da Vinci, Grundtvig

- 4.4 As far as the **Comenius** programme is concerned, the proposal is for the existing range of action to continue largely as at present. It will encompass individual mobility, school partnerships, multilateral projects, Comenius networks and accompanying measures. The decentralised mobility and partnership actions would increase in volume by a factor of four, so as to achieve the participation of 10% of pupils in joint educational activities (partnerships and mobility) and of 10% of teachers in mobility activities over the seven-year lifespan of the Integrated Programme.
- 4.5 The most visible proposed change to the **Erasmus** programme is a very substantial increase in student and teacher mobility. Currently just over 120,000 students participate in Erasmus mobility annually. Under the new programme, that rate would need to increase to some 375,000 per year, in order to reach the target of three million Erasmus students by 2010. At the same time, the average student grant has remained unchanged since 1993 at EUR 150 per month. This represents a 25% cut in value in real terms. Clearly the target cannot be achieved without a substantial increase in the level of the grant; under the Commission's proposal the monthly average would increase to EUR 250. Teacher mobility is planned to increase to 40,000 per year, from a level at present of some 18,000, with a similar boost in the grant level. Work placements for university students and staff will also be incorporated.
- 4.6 The new programme proposal envisages a number of changes to **Leonardo da Vinci**. Placements for trainees would see a substantial increase to 150,000 per year by the end of the programme, from their current level of some 45,000. A similar increase is envisaged for trainer mobility. The current pilot projects action will be re-cast to focus on the transfer of innovation from one or more countries to another, and the administration of these projects will be entirely decentralised to the National Agencies, rather than shared with the Commission as at present. Leonardo networks will be introduced in the new programme, to focus on issues of common European interest in a similar fashion to the Erasmus thematic networks. There will be a new Leonardo "Partnerships" action to promote exchange of expertise between training providers. Project activities and accompanying measures will also continue.
- 4.7 Under **Grundtvig**, new mobility actions are proposed to support the mobility of adult learners, staff exchanges, European assistantships, and an expansion of the training opportunities for adult educators addressed by the current Grundtvig action. Given the demographic changes forecast for the next decade, it is essential to make the European dimension of mobility available not only to younger citizens and those that teach or train them, but also to adults in lifelong learning more generally. The aim is that at least 50,000 adults should benefit from such mobility per year, and that by the end of the programme at least one in five structured adult education providers should have participated in European cooperation. The instruments to achieve these targets will be mobility grants and European learning partnerships. The centralised activities

of Grundtvig will include strategic as well as smaller-scale cooperation projects, networks, training courses and accompanying measures.

The transversal programme

- 4.8 The transversal programme represents one of the innovations of the Integrated Programme. It is designed to provide better support than has been possible up to now for cooperation on issues that do not fit easily into one of the sectoral programmes, or that have a potential interest and impact across the entire programme.
- 4.9 The **policy development** key activity will provide a more stable and comprehensive source of support for work at European level that is directly related to key policy priorities. This key activity will permit the Community to sustain the follow-up to the objectives process and the lifelong learning resolution at European level, to invest in an appropriate way in the collection and analysis of statistics and indicators, to support experimental projects to test cutting-edge policy ideas (in a similar way to the “Tuning” project), and to support the appropriate reference and analytical structures that underpin the actions of the programme at European level.
- 4.10 The **language learning** key activity is conceived as a complement to the high-volume language activity integrated into the sectoral programmes, such as some 30% of Comenius mobility and partnerships. It responds to a clear message from the public consultations on the future programmes and on the language action plan, that languages should be a high priority for visible, substantial and exemplary support at European level. The language learning key activity focuses on aspects of language learning that span more than one sector, such as the development of generic language learning materials, networks in the fields of language learning and linguistic diversity, and marketing, publicity and information. Similarly, the key action on **information and communication technologies (ICT)** will focus on cross-cutting activities aimed at the development of innovative ICT-based content, services, pedagogies and practice for lifelong learning. It will be implemented through multilateral projects and networks, and through other action such as observation, benchmarking, and quality analysis.
- 4.11 The **dissemination and exploitation of results** key activity is entirely new as a dedicated part of the programme, and is designed to make the process of spreading and capitalising on the results and products of the programme more systematic and effective than before, building on experience gained in particular under Leonardo da Vinci. Both the public consultation and the evaluation reports point to dissemination/exploitation as a major weakness in the implementation of the existing programmes. To address this, the Commission will create a dedicated activity, with earmarked resources and clear objectives, which will permit the building-up of a solid body of expertise in the field and will provide the necessary continuity of funding to make the action effective in the longer term. The action will be implemented through multilateral projects and the collection and study of data, good practice and products resulting from the programme.

The Jean Monnet programme

- 4.12 The Jean Monnet programme will consist of three key activities, all focusing on aspects of European integration: the Jean Monnet Action itself, support for specific

European institutions, and support for European associations in education and training.

- 4.13 The **Jean Monnet Action** will carry forward the valuable work it has so far undertaken, and will encompass the support for research into European integration hitherto funded under budget line A-3022. It will continue to support Jean Monnet Chairs, associations of professors, other higher education teachers and researchers specialising in European integration, support for young researchers in the field, information activities, and the establishment of multilateral research groups.
- 4.14 The key activity to support **European institutions** will consist of the allocation of operating grants to organisations at European level. These should include the College of Europe (Bruges and Natolin campuses); the European University Institute, Florence; the European Law Academy, Trier; and the European Institute of Public Administration, Maastricht. In particular, the Commission will propose funding for the establishment of a European post-doctoral college at the European University Institute, to focus on advanced research in its fields of specialisation. Further operating grants for institutions will be awarded on a competitive basis following calls for proposals.
- 4.15 Under the third key activity, operating grants will be allocated to support the running costs of **European associations** active in the fields of education and training, which act as European groupings of national and regional associations, selected on a competitive basis following calls for proposals.

PART V – EXTERNAL POLICY: TEMPUS PLUS

- 5.1 The Commission believes that the Union should offer the current Tempus countries a programme with coverage parallel to the Integrated Programme for lifelong learning, even if its instruments and structure must be significantly different. The Commission therefore proposes not simply to renew the Tempus programme but to create “Tempus Plus” – a programme addressing these wider needs in a structured context which builds on the successes of Tempus, but adds the new dimensions which the evaluations and the new content require. It would therefore cover, in addition to the traditional Tempus area of higher education, the areas of school, vocational education and training and adult education. To resource such a major increase in scope would require a significant budgetary increase.
- 5.2 As regards geographical scope, the Commission believes that the ensemble of Tempus countries should continue to benefit from the cooperation and assistance that Tempus has provided. However, it may no longer be appropriate to treat them all on the same basis. Tempus Plus should enable sectors of cooperation to be chosen in the light of the needs and priorities of each of the partner countries. Thus, the full range of cooperation across all sectors might be appropriate for some, while for others vocational education and training might represent the highest priority. Using this modulated approach, it is envisaged that Tempus Plus should become a privileged instrument to develop the “New Neighbourhood” policy set out in the 2003 Commission Communication²¹.

²¹ COM(2003) 104 final.

- 5.3 Tempus Plus should also be open to the Western Balkan countries, whose prospect of eventual membership of the Union was confirmed by the Copenhagen Council in December 2002 and most recently at the Western Balkans summit in June 2003. Here, too, closer cooperation in the field of education and training is an important component of the overall development strategy. Just as the Tempus programme facilitated the transition of the current acceding countries into the mainstream Community education and training programmes, so the Western Balkans, which joined the current phase of Tempus only recently, should retain access to this type of support. Obviously, when individual countries transfer to the internal Integrated Programme, they would withdraw from Tempus Plus.

Tempus Plus – an assistance programme for Lifelong Learning

- 5.4 The proposed Tempus Plus programme should therefore be based, like Tempus, on cooperation between systems and institutions in the EU and their counterparts in the eligible countries. Its objectives will be:

- to foster the development of human resources and human capital, and in particular to promote the reform and development of lifelong learning systems in the partner countries;
- to enhance the quality and the capacity of lifelong learning institutions and organisations in the partner countries.

The aim would be to support the mobility of 100,000 individuals over the lifetime of the Tempus Plus programme.

- 5.5 It would be divided into four strands, each of which would build on work already done in partner countries, and would seek to support them in development work as follows:

- **A Systems strand.** This would support partner countries' work in areas which affect the effectiveness of education and training systems as a whole, such as qualifications issues and frameworks; management and policy development; forecasting of needs and possible responses; promoting flexibility and permeability between different parts of the education and training systems. It would also promote convergence between the lifelong learning systems of partner countries and those within the European Union.
- **A Schools strand.** This would support partner countries in areas such as content, curricula and qualifications; the acquisition of the basic skills - literacy, numeracy, languages - as well as skills in information technology, entrepreneurship, social and intercultural skills, learning skills; and teacher training.
- **A Higher Education strand.** This would build on existing Tempus activity to support partner countries in reforms to higher education, including activities aimed at capacity building as well as measures leading to convergence, equality of access to higher education, better responsiveness to labour market needs; and enhancing the capacity of higher education to contribute to economic development generally

- A **Vocational Education and Training strand**, which would also embrace adult education. This would support partner countries in areas such as providing learning opportunities to meet the needs of adult learners; the mutual recognition and transmission of qualifications and of learning, in particular non-formal and informal learning; strengthening VET and adult education systems; the promotion of active citizenship, active ageing and social cohesion and inclusion; or improving occupational guidance and counselling.

5.6 The instruments available to support this will be of four types:

- **System measures:** these will contribute to the development and reform of education and training systems in partner countries, as well as to enhance their quality and increase their convergence with those of the European Union. They will operate on themes agreed with partner countries, and will cover issues such as support for policy development and reform, systems and capacity development (including through mobility), studies and research, provision of expert advice, conferences, seminars and training and development activities.
- **Joint Projects:** these will resemble the classic Tempus projects. They will enable institutions in the EU and in partner countries to join forces and work together on all areas of education and training. These include the joint teaching projects, but also other areas such as curriculum, teaching and learning materials, management issues, and in-service training. This type of action will also include student and staff mobility, which the Commission believes (and as the evaluations suggest) should be considerably increased. It will also include a network action, which could operate either independently or in association with networks supported under the Integrated Programme.
- **Mobility:** In addition to the mobility supported under Joint Projects, this action will provide further opportunities to improve cooperation and enhance mutual understanding between Europe and its neighbours. Mobility will take place between EU Member States and partner countries at every level of the programme. It will include individual mobility (along the lines of the current Tempus Individual Mobility Grants) as well as group mobility.
- **Accompanying Measures:** these will contribute to the development of common understanding and cooperation in lifelong learning. They may include exchanges of experience on policy issues; observation and analysis of policies and systems; the development of indicators and benchmarks and statistical surveys; and information and dissemination activities.

These four types of instrument form a package which offers both partner countries and the EU a variety of ways to interact and to effect reform. Their operation will require considerable expertise, and where appropriate, the Commission will draw on the experience of the European Training Foundation.

PART VI - SIMPLIFICATION

- 6.1 In its Communication on the Financial Perspectives, the Commission underlined the importance of using the revision of programme legislation which occurs in 2007 to simplify the conception and in the operation of Community instruments. The two

new programmes mentioned in this Communication will contribute significantly to this. From the formal perspective alone, they represent a reduction in the number of the legal bases in education and training from seven at present to three – the two programmes here and the Erasmus Mundus Programme, which has been so recently adopted that it would be inappropriate at this stage to amend it. Similarly, it represents a reduction from fifteen budget lines to three.

- 6.2 More importantly, however, the new programmes – particularly the integrated Lifelong Learning Programme – will be simpler for the user, for a number of reasons. First, a greater proportion of the actions will be managed in a decentralised manner through National Agencies – over 80% of the programme budget. The public consultation²² showed that users regard this management method as more user-friendly than direct management at Community level, since the Agencies are familiar with the circumstances in their country, and can respond at once with the appropriate knowledge and in the national language. Secondly, the legislative decisions will be written in a much less detailed manner, making it easier both to understand their content and to adapt it to future developments in the field. Thirdly, the Commission will include in the draft legislation a provision that beneficiaries' financial and administrative obligations must be proportionate to the size of the grant, for example through an increased use of lump sums and flat-rate grants, with the intention that this should lead to significant procedural simplification. The aim here is to respond to the demand in the public consultation to reduce the complexity which is widely seen as the most negative aspect of these programmes.
- 6.3 The Commission regards these measures as an important step towards simpler programmes, but certainly not the end of the road. The Commission is interested to receive suggestions how the programmes and their operation could be simplified, and will seek to include these in its draft proposals. These may indeed imply amendments to the Community's Financial Regulation or its Implementing Rules, for example; but no possible avenue should be excluded at this stage.

NEXT STEPS AND TIMETABLE FOR ADOPTION

The Commission is putting forward this paper in order to put its intentions for the next generation of programmes in the fields of education and training into the public arena as early as possible. Given the necessary length of debate around such proposals, which is mirrored by the time needed for completion of the co-decision process between the European Parliament and Council, it is necessary to start this discussion as soon as possible if there is to be a reasonable chance of adopting the final texts in early 2006, to leave as near a full year as possible before the implementation of the new programmes. The Commission expects to present its formal legislative proposals before the summer break 2004.

²² See paragraph 3.3 of this Communication.

Transcript of Address to General Assembly Hania September 2004

James HORAN

Dublin, Ireland, President of the EAAE

You are all very welcome to the General Assembly of the EAAE. It is my intention, first of all, to briefly describe to you what has occurred since this time last year. The Council has had a number of meetings during the year and the underlying theme of the discussions at the Council has been the future of EAAE while at the same time dealing with the day to day business of running the Association. On the opening night of the Chania meeting we were reminded that this is the seventh meeting of the Heads of Schools. Where children are concerned, being seven years old is regarded as reaching the first stage of maturity. It's the time when children are expected to take a certain amount of responsibility for their actions. Perhaps this Seventh Meeting has that significance for us. We are coming of age. More significantly, next year, 2005, the EAAE will be thirty years in existence. With that in mind it is our intention to continue the process of re-evaluation and to look towards the future and the role of the Association in what is definitely a changing environment in Europe and indeed a changing environment globally. The discussions we have had this week already clearly indicate that there is significant change ongoing in architectural education and we, as a representative Body of educators, have to be entirely cognisant of this. More particularly we should be leaders in the field. Ours is the group who should decide what the future of architectural education in Europe will be.

As part of the work of Council we have drawn up a series of protocols and guidelines to structure in a clearer way where our work is going and how it will develop in the future. Because of that we have identified a three level structure within the Association. This consists firstly of the President, Vice-President, Treasurer and Council Members who become the Executive Body of the Association. Traditionally the work of Council was supported by a series of Project Leaders who carried out various tasks on behalf of the Association. These roles will continue and I intend to talk about each of these later. In the coming year however, it is our intention to introduce another layer of responsibility which will form a greater sense of coherency between the Council and the Project Leaders and between Council, Project Leaders and the Membership. The intention here is to identify individual members of Council who will, in addition to their Council duties take a responsibility for certain areas of activity relating to the Project Leaders. This will mean that all of the activities of the Association will be structured in a manner that will ensure a full reporting mechanism and, as the Council membership changes, which it will naturally do over time, the lessons of the past are fully documented avoiding the need to reinvent the wheel with each change of administration. With that in mind the areas in which we have initially identified as important, but by no means exhaustive, are as follows:

Publications and Conferences

These form a significant aspect of the work of EAAE. These are the methodologies by

which we discuss and debate matters among ourselves and they are also the means by which we communicate with others. The result and the fruit of those discussions can only be communicated to Schools and others involved in architecture if we publish. This publishing activity should encompass books and reports, leaflets, the website, the news sheet and any other method deemed appropriate.

Knowledge and Information

The second area that is regarded as important is the entire area of knowledge information and a database to contain this knowledge. Knowledge is really our greatest asset. What we possess most of all is what we know. It is an objective to establish a well developed database of knowledge, of contacts and of documents related to Architectural Education and other Associations appropriate to EAAE. The strength of EAAE will come from the knowledge it possesses.

Research

The third area of significance is the area of research. Needless to say the sense of development and moving forward to the future and pre-empting problems before they occur is very often part of the work of research. The position of research and the nature of research in architecture is currently a topic which is generating considerable debate. We must engage in these discussions and become a forum for their advancement. The Council will need to identify someone who will be responsible for co-ordinating these efforts.

Public Relations

Quite separate from the publication activities there is need for good public relations. A public relations policy will be developed between the Association and the Schools it represents, between the association and other organisations across the world who have an interest in architecture and architectural education and between the association and the public in general. We have a responsibility as educators to extend the educational process beyond the formal tasks in our Schools. There is a growing understanding that Schools and Universities have a responsibility outside of their perimeter walls. We would see our association as having a role in developing that thinking process and enhancing the role of Schools of Architecture in the communities in which they are located.

Finance and Sponsorship

Underpinning most of this is of course the single significant area of finance. Finance in fact is what allows us to operate. I suppose, you could say, it is a necessary evil, but nevertheless it is necessary and the association needs to have financial stability in order to carry out its work. You are aware of course that in the last year we increased the membership fee, and I am delighted to say that the existing Schools, almost without exception were able to accept that increase. This has provided the Association with additional financial flexibility. Tied-in with finance there is the question of sponsorship. You are aware that there have been many types of sponsors involved with the work of the Association to date. We are conscious of the need for sponsors, but we are also

conscious of the fact that sponsorship is something that has to be seen in a specific light by the Association. This is not an area where the Association becomes the performer on behalf of a sponsor. It is important to find sponsors who are prepared to support the activities of the EAAE as defined by the Association. This is one of the delicate areas that we need to explore. We need to be grateful to our sponsors while at no time losing our integrity or our identity.

Links with Other Organisations

Finally, there is the question of a series of relationships with other organisations, particularly those who are involved in architecture and architectural education. In particular there is our relationship with our counterpart in the United States - the ACSA, and our relationship with the ARCC and other organisations representing both the profession and the educators of in Europe and beyond.

The Council of EAAE set down a number of initial objectives relating to the above mentioned points at the start of last year. Some of these have already been achieved or partially achieved but many of them will remain on the objective list for the Association going into the future.

The first objective is the development of a fully professional association with a permanent Secretariat. In the thirty years since EAAE was founded it has steadily grown to the point where it needs this sense of permanence that will result in the association being in a position - irrespective of the membership of Council, or irrespective of who holds the Presidency - to continue the work of the Association in a seamless manner. In order to be able to engage with others on a fully professional basis we must also be seen to be fully professional.

The second objective is to increase the membership of the Association. At the moment there are more than 100 Schools of Architecture participating in one form or another. It is the ambition of the Council to significantly increase the number of participating Schools. We have a number of vehicles by which this can be achieved. Within Europe itself of course we will be endeavouring to encourage Schools to become full members and fully participate in the work of the Association. Outside of Europe we will be inviting Schools to take up associate membership and become aware of what is happening in Europe at this very important time.

The third area of importance is to increase the involvement of existing member Schools at as many levels as possible. Last year Council wrote to all member Schools and invited them to submit nominations for new members of Council. I am pleased to say that a large number of Schools and individuals responded to this request and many nominations were received. In fact, the list was so impressive that we felt obliged to write to the individuals who had been nominated and asked them to present a short statement as to how they would see their skills and experiences being valuable to Council and the Association as a whole. Stemming from that we received a variety of both interesting and erudite submissions and as a result new Council members are now being proposed. Before discussing this issue and asking the General Assembly to approve the new Council members I would now like to refer to the individual areas of activity which have occupied the time of both the council Members and the Project Leaders during the past twelve months.

The News Sheet

You will see that the News Sheet which is our principal arm of communication has had a face lift. Those of you who have seen the most recent edition will be aware of the change in design and presentation and the expansion of both size and contents. The news sheet continues to grow. This work has been due to the efforts of Anne Elisabeth Toft. I would like to commend the work she has done in this area and also to identify the support she has received from her School in Aarhus. One of the key issues here is that individual members of Council and the Project Leaders within EAAE depend entirely on the support and permission from their Deans, their Rectors, and their Schools to allow them to give the time to fully participate in the work of the Association. We are extremely grateful to Peter Kjaer, the Rector of the School of Architecture at Aarhus who has been hugely supportive in the publication of the news sheet.

AG2R Competition

Emil Popescu from the University of Bucharest was responsible for the organisation of the international competition for Architectural Students. This competition dealt with the subject of designing for elderly people, designing for the third and fourth age. The competition was sponsored by the French Company AG2R and it attracted a very large student entry from all over Europe. It was judged in Paris by a Jury chaired by Mario Botta. It is our intention to publish in detail the submissions of this competition as many interesting areas of design were explored and investigated.

Guide to the Schools of Architecture

Leen Van Duin from the Technical University of Delft has produced a new and updated version of the Guide to the Schools of Architecture of Europe. This is the Association's most successful publication. It is extremely important as it will become clear to Schools who are not in the Guide that they should be and this will allow us to specifically target these Schools in our drive to increase the membership of the Association.

The Chania Meeting and Thematic Networks

Here in Chania we are supported enormously by the work done by Dinos and Maria and the Thematic Sub-networks. This support is endorsed by their School, the Aristotle University of Thessaloniki. This initiative has had the single most important impact on the Chania meetings. It has allowed the meetings to continue, but also it has had an enormous impact on the Schools of Architecture that have been involved. The introduction of the thematic sub-networks has been a huge stabilising influence on the work of the Association and on the Chania meeting in particular. Those of you who may be here in Chania for the first time will have no concept as to the amount of time, effort and work that takes place throughout the year in preparation for this event. Over the past two years meetings have taken place in the Henry Van de Velde Institute in Antwerp as a preparation for the Chania Event. We are extremely grateful to Richard Foque, Head of that School, who has facilitated these meetings, and the members of the Association who attended and participated. I believe that the staff of the Schools of Architecture who have attended the various meetings have benefited enormously from their involvement.

Velux Prizes

Ebbe Harder has been working with Velux Denmark in organising two specific events, the second competition for New Writings in Architecture for Educators and an international competition for students of Architecture entitled 'The Light of Tomorrow'. These two competitions have been hallmarked by a superb professional organisation and we eagerly await the outcome of their endeavours.

EAAE/ARCC Conference

The Dublin School of Architecture, at the Dublin Institute of Technology, in June of this year hosted a joint Conference between EAAE and ARCC under the heading 'Between Research and Practice'. The conference was attended by over 100 delegates from both the United States and Europe. A report on that Conference is in the current EAAE News Sheet, and the proceedings are currently being prepared for publication.

The outcome of these projects and those who have worked on them have been the core blood of the Association. We would like to thank those who have been involved and encourage the work to continue. Indeed we would wish to see new projects being identified and developed. Under the heading of new projects, a series of guidelines have been drawn up to inform members on how a project can be introduced to the Association. Broadly speaking a project may be introduced by Council themselves and they may then seek to find a project leader. Alternatively a member of the Association may identify a project and submit it to Council for approval. A series of guidelines have been prepared to identify how the project should be run, how it is financed, how it is reported upon and how ultimately it is finalised, closed down, recorded and archived. Again this is part of the building of the knowledge database.

During the past year I, as President, have had the opportunity to represent the EAAE at a significant number of events. Many of these were particularly valuable in developing the thinking process that helps identify the future of our Association. They have also been important from the point of view of establishing contacts and widening the influence of and the information about the EAAE. Last November I attended the annual conference of our sister organisation in the United States, the ACSA. It was both an interesting and revealing process to observe how a similar organisation to ours carries out its business, deals with its problems and maps out its future. The attendance at this particular event was instigated by Marvin Malecha, the Dean of the School of Design at the North Carolina State University. We thank him for his continued support and interest in the work of EAAE over many years and ensuring that the links across the Atlantic are maintained.

In the Spring I was invited to meet SCHOSA, the Standing Council of Heads of Schools of Architecture of the United Kingdom. They were particularly interested in the work being done within EAAE and how we saw the future of architectural education in Europe. They were specifically curious about the stance being taken by many Schools in 'the post-Bologna environment' and on the Bachelors/Masters issue. I was able to inform them on the extent of the work, the investigation, discussion, debate and knowledge gathering that has been done and continues to be done in this area.

I was also invited to meet the Board of the Architects Council of Europe, the Body representing the professional institutions. Two meetings took place with them throughout

the year, one in Brussels and one in Dublin. I believe that we have a real possibility of exploring areas of mutual interest between that organisation and the EAAE. They have invited us to form with them a joint working party to explore these areas. As I believe that the professions share a responsibility with Schools in the wider area of the Architectural Education, I now seek a mandate from the General Assembly to establish this joint working party with the Architect's Council of Europe. [Approved]

New Members

A number of applications were received for membership of EAAE as follows.

Full membership

Fachhochschule DESSAU – Germany

Universitat de Beira Interior – LAUBI, COVILHA – Portugal

School of Architecture – MOSKOU – Russia

Associate members

Ryerson University, TORONTO – Ontario – Canada

TECHNION – Faculty of Architecture – Israel

Auburn University – Alabama – USA

Individual Member

Kevin Mitchell – Sharjah – United Arab Emirates

I seek the General Assembly's approval for these new members. [Approved]

The Future

So what is on the Agenda for the coming year?

Firstly, the Council wishes to expand its membership by the introduction of two new members. The two members proposed have been identified from the large number of submissions and their selection relates closely to the strategic objectives I have already mentioned.

The proposed new members of Council are:

Ramon Sastre from the Escola Technia Superiore Arquitectura del Valles [UPC] Sant August del Valles Spain, and

Hilde Heynen from the Catholic University of Leuven, Belgium.

Ramon is an Architect of exceptional technical experience and commitment to architectural education and will extend the influence of the Association to the Iberian Peninsula.

Hilde, whose experience in the areas of academia and international conferences is widely known, will be expected to bring a new level of academic rigour to the work of the association in the areas of Conferences and Peer Reviewed Papers.

I now seek the approval of the General Assembly of these new Council members. [Approved]

This time next year my term of office as President will come to an end and a new President

will take over in my place. Therefore, I now propose to you a new Vice-President and President-elect of EAAE, Per Olaf Fjeld. Per Olaf has been serving as a member of Council for the past number of years and during that time he has brought enormous wisdom and stability to Council's work and great clarity of thought to the strategic issues which are the core of the Council's business. I therefore now seek your approval for Per Olaf Fjeld as Vice-President. [Approved]

Finally, on Council matters I announce the resignation from Council of Stephane Hanrot. Stephane has been working on research and architectural doctorates. His new appointment to Professorship means that he will be unable to devote time to Council in the immediate future. This leaves a position open for a further Council member and the existing nominations will be re-examined with this position in mind. However, do not exclude the possibility of submitting further nominations to the Council, I invite you to consider this.

I wish to thank you, the membership of EAAE, for your enormous support and dedicated work that has been carried out over the last twelve months. The endeavours of the Association during the last year and over the past few years has meant that the EAAE has actually come of age. The platform for the future is well under construction. I look forward to an eventful and fruitful year ahead.

Inquiry on Competences for Graduate Architects in Europe

For the effectiveness and the validity of this inquiry it would be of great importance if you circulated / forwarded this questionnaire to the other members of teaching staff of your school.

Dear colleague

The European Network of Heads of Schools of Architecture (ENHSA) is a project initiated by the European Association for Architectural Education (EAAE) in the framework of the Socrates Programme: "Thematic Networks". This initiative aims at helping schools of architecture to better and more effectively integrate in the New European Higher Education Area.

The need for compatibility, comparability and competitiveness of higher education in Europe, as this is suggested by the new political context in Europe, demands reliable and objective information about educational structures and the content of studies, that is the education programmes we offer. We therefore need new tools and approaches in order to be able to describe our curricula as well as to recompose them in the prospect of the reforms suggested by the above context.

Learning outcomes and competences are the most relevant elements in the design, construction and assessment of qualifications ensured by schools of architecture, as they constitute the reference points to be met. By learning outcomes we mean the set of competences including knowledge, understanding and skills that a learner is expected to know/understand/demonstrate after completion of a short or long learning process.

With the following questionnaire we are trying to generate a rank order of learning outcomes and competences that, according to the teachers of European Schools of Architecture, a graduate must fulfill and possess. We are expecting that the outcome of this inquiry will give to schools of architecture a tool which will help them to better articulate their educational objectives as well as their reference points for quality assessment. Competences are described as points of reference for curriculum design and evaluation, and not as straitjackets. They can allow flexibility and autonomy in the construction of curricula. Moreover, they provide a common language for describing what curricula are aiming at.

We kindly ask you to fill this questionnaire and to support the efforts we are making in the framework of the EAAE/ENHSA Socrates Thematic Network. For any additional information and clarification please contact us.

Thank you in advance for your cooperation and contribution.

On behalf of the EAAE Council and the ENHSA Steering Committee
As. Prof. Dr. Constantin Spiridonidis
ENHSA Coordinator

Your School

University, School, Department:

City:

Country:

Bologna framework implemented in your school (Bachelor/Masters): yes/no

Your Profile

Qualifications

Architect ☐ Enginner ☐ Urban ☐ Planner ☐ Historian ☐ Sociologist ☐
Philosopher ☐ Other ☐

Titles

Diploma ☐ MSc ☐ MA ☐ Dr ☐ PhD ☐ Other ☐

Position in the School

Assistant ☐ Lecturer ☐ Assistant Professor ☐ Assoc. Professor ☐ Professor ☐
Other ☐

Status

Full time ☐ Part time ☐ Permanent ☐ Contractual ☐ Other ☐

Age

<30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ >60 ☐

Sex

Male/Female

Questionnaire Part 1: General Competences

Indicate by clicking the appropriate circle for each higher education cycle (Bachelor, Masters Graduate or 4 to 6 years of continuous studies Graduate, Doctorate), how important it is that a student should have the particular competence on a scale of 1 to 4 according to the following values : 1=None, 2=Weak, 3=Considerable, 4=Strong.

Indicate by ticking the appropriate box after each competence whether in your institution the particular competence is systematically evaluated by the implemented evaluation processes.

1. Ability to work in an interdisciplinary team ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

2. Ability to develop a trans-disciplinary understanding ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

3. Appreciation of the diversity and multicultural quality of contemporary European society ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

4. Ability to identify and work towards targets for personal, academic and career development ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

5. Awareness of and respect for points of view deriving from other national and cultural backgrounds ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

6. Ethical commitment ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

7. Capacity to develop an analytical and critical thinking and understanding ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

8. Capacity to apply knowledge in practice ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

9. Capacity to apply a spirit of synthesis of ideas and forms ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

10. Capacity to generate creatively new ideas and forms ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

11. Capacity to adapt proactively to changing situations ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

12. Capacity to evaluate ideas, proposals, forms ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

13. "Learning to learn" ability ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

14. Decision – making skills ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

15. High level computing skills including the ability to use the Internet critically as a means of communication and a source of information ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

16. Personal and social skills in expression and communication by speaking, writing and sketching ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

17. Ability to receive and respond to a variety of information sources (textual, numerical, verbal and graphical) ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

18. Basic knowledge of all the professional applications of the discipline ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

19. Responsibility for one's own work and ability to be self-critical in relation to that ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

20. Knowledge of languages ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

Other Competences:

Questionnaire Part 2 : Specific Competences related to the profession1. Ability to create architectural designs that satisfy both aesthetic and technical requirement ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

2. Adequate knowledge of the history and theories of architecture and related arts, technologies and human sciences ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

3. Awareness of the issues and themes of present day architectural debate ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

4. Ability to recognize and use appropriately architectural theories, concepts, paradigms and principles ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

5. Knowledge of the fine arts as an influence on the quality of architectural design ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

6. Knowledge of contemporary and historical works that have achieved the highest standards in architecture ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

7. Ability to abstract and present key elements and relationships ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

8. Adequate knowledge of urban design, planning and the skills involved in the planning process ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

9. Understanding of the relationship between people and buildings and between buildings and their environments, and of the need to relate buildings and the spaces between them to human needs and scale ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

10. Awareness of the potentials of new technologies ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

11. Understanding of the profession of architecture and the role of architects in society, in particular in preparing briefs that account for social factors ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

12. Critical awareness of the political and financial motivations behind clients' briefs and building regulations so as to develop an ethical framework for decision making within the built environment ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

13. Critical awareness of the relationship between current developments in architecture and the past ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

14. Understanding of the methods of investigation and preparation of the brief for a design project ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

15. Understanding of the structural design, construction and engineering problems associated with building design ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

16. Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

17. Necessary design skills to meet building users' requirements within the constraints imposed by cost factors and building regulations ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

18. Adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

19. Ability to work both with a high degree of autonomy and collaboration ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

20. Ability to engage in self-managed and life-long learning (eg working independently, time management and organization skills) ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

21. Awareness of the need for continuous professional development ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

22. Ability to respond creatively and flexibly to changes in the professional environment ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

23. Ability to communicate appropriately to a variety of audiences in oral, written and graphic forms ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

Other Competences:

Part 3 : Specific competences. Research in Architecture

1. Awareness of the ongoing nature of architectural research and debate ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

2. Critical awareness of the relationship between current architectural discourse and practice and the architecture of the past ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

3. Awareness of the highest standards of achievement in architecture, in design, in built work and in scholarship ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

4. Awareness of the moral and ethical issues of investigation and the need for professional codes of conduct in research (eg. appropriate acknowledgements of contributions, etc.) ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

5. Ability to define research topics which will contribute to knowledge and debate within architecture ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

6. Ability to formulate research questions ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

7. Ability to identify and use paradigms, theories concepts and methods of enquiry appropriate to the discipline and the topic of enquiry ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

8. Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.) ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

9. Ability to prepare, process, interpret and present data using appropriate qualitative and quantitative techniques ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

10. Ability to work with a high degree of autonomy (eg. Accept responsibility for research project planning) ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

11. Ability to communicate appropriately in written, oral and graphic forms ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

12. Awareness of and ability to use appropriate tools of other human and physical sciences (eg. Literary criticism, art history, philosophy, studies in constructional analysis, etc.) ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

13. Ability to use IT and Internet resources (statistical, cartographical methods, database creation, etc.) ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

14. Ability to collect and integrate several lines of evidence to formulate and test hypotheses ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

15. Ability to plan, conduct and report on investigations ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

16. Ability to write in one's own language, using correctly the various types of architectural literature ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

17. Ability to reference sources accurately and appropriately ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

18. Ability to evaluate evidence and draw appropriate conclusions ☐

Bachelor Graduate:	1	2	3	4
Masters Graduate or 4 to 6 years of continuous studies Graduate:	1	2	3	4
Doctorate:	1	2	3	4

Other Competences:

Questionnaire concernant les compétences sanctionnées par les diplômes d'architecture en Europe

Pour l'efficacité et la validité de cette enquête, il est d'une grande importance que vous envoyiez/fassiez circuler ce questionnaire en le transmettant aux autres membres de l'équipe pédagogique de votre établissement.

Madame, Monsieur,

Le Réseau Européen des Directeurs des Ecoles d'Architecture (ENHSA) est un projet mis en place par l'Association Européenne pour l'Enseignement de l'Architecture (AEEA) dans le cadre du Programme Socrate : « Réseaux Thématiques ». Cette initiative a pour objectif d'aider les écoles d'architecture à s'intégrer de façon plus efficace au nouvel espace européen de l'enseignement supérieur et de la recherche.

La nécessité d'une compatibilité, d'une comparabilité et d'une compétitivité de l'enseignement supérieur européen suggérée par le nouveau contexte politique en Europe demande une information fiable et objective sur les structures de l'enseignement et le contenu des études, sur ce que nos programmes éducatifs offrent précisément. Nous avons donc besoin de nouveaux instruments et de nouvelles approches pour être capables de décrire nos cursus et pour les recomposer dans la perspective des réformes suggérées par le contexte évoqué ci-dessus.

Résultats d'apprentissage et compétences sont les éléments les plus appropriés dans la conception, la construction et l'évaluation des qualifications assurées par les écoles d'architecture, puisqu'ils constituent les points de référence que l'on doit y rencontrer. Par résultats d'apprentissage, nous entendons l'ensemble des compétences, y compris la connaissance, la compréhension et les capacités qu'un apprenant est tenu de connaître/comprendre/montrer après avoir accompli un processus d'apprentissage court ou long.

A l'aide du questionnaire suivant, nous essayons de faire un classement hiérarchique des résultats et des compétences d'apprentissage qu'en accord avec les professeurs des écoles d'architecture européennes, un diplômé doit avoir accompli et doit posséder. Nous pensons que les résultats de cette enquête fourniront aux écoles d'architecture un instrument qui les aidera à mieux articuler leurs objectifs éducatifs et leurs points de référence pour une évaluation qualitative. Les compétences sont décrites en tant que points de référence pour l'élaboration et l'évaluation du cursus et non en tant que contraintes. Elles peuvent permettre flexibilité et autonomie à la construction des cursus. De plus, elles offrent une langue commune pour la description de leurs objectifs.

Nous vous demandons de bien vouloir remplir le présent questionnaire et de soutenir les efforts que nous faisons dans le cadre de AEEA/ENHSA Socrate Réseau Thématique. Pour tout renseignement complémentaire et tout éclaircissement, n'hésitez pas à nous contacter.

Merci par avance de votre coopération et de votre aide

Pour le conseil de l'AEEA et le comité de coordination ENHSA

As. Prof. Dr. Constantin Spiridonidis

Coordinateur ENHSA

Votre Ecole

Université, Ecole, Département:

Ville:

Pays:

Votre école a-t-elle adopté le système 3-2 Bachelor/Master : Oui/Non

Votre Profil*Qualification*Architecte ☐ Ingénieur ☐ Urbaniste ☐ Historien ☐ Sociologue ☐ Philosophe ☐
Autre ☐*Titres*Diplôme ☐ MSc ☐ MA ☐ Dr ☐ PhD ☐ Autre ☐*Position dans l'Ecole*Lecteur ☐ Assistant ☐ Maître de Conférence ☐ Professeur Assoc. ☐ Professeur ☐
Autre ☐*Statut*Temps Complet ☐ Temps Partiel ☐ Permanent ☐ Contractuel ☐ Autre ☐*Age*<30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ >60 ☐*Sexe*Masculin ☐ Féminin ☐**Questionnaire Partie 1: Compétences génériques**

Indiquer en cliquant sur le cercle approprié, l'importance de chaque compétence pour le profil des diplômés de chaque niveau d'enseignement supérieur (Licence/Bachelor, Master ou Diplôme d'un cursus de 4 à 6 ans consécutifs, Doctorat). Utilisez l'échelle suivant: 1 = aucune; 2 = faible; 3 = grande, 4 =considérable.

Indiquer en cliquant sur la case correspondante à chaque compétence, si dans votre établissement cette compétence est évaluée systématiquement par les méthodes d'évaluation adoptées.

1. Capacité à travailler au sein d'une équipe interdisciplinaire ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

2. Capacité à développer une compréhension transdisciplinaire ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

3. Appréciation de la diversité multiculturelle de la société européenne contemporaine ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

4. Aptitude à déterminer des objectifs de développement personnel, universitaire ou de carrière ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

5. Prise de conscience et respect de points de vue issus d'autres environnements culturels et nationaux ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

6. Engagement éthique ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

7. Capacité à développer une pensée et une compréhension analytiques et critiques

Titulaire de Bachelor ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

8. Capacité à mettre les connaissances en pratique ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

9. Capacité à appliquer un esprit de synthèse des idées et des formes ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

10. Capacité à produire de nouvelles idées et de nouvelles formes de manière créative ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

11. Capacité à s'adapter à des changements de situations ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

12. Capacité à évaluer des idées, des propositions et des formes ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

13. Aptitude à "apprendre à apprendre" ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

14. Capacité à prendre des décisions ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

15. Haut niveau de compétences informatiques (utilisation critique de l'Internet comme moyen de communication et source d'information) ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

16. Compétences personnelles et sociales d'expression et de communication (oral, écrit, graphique) ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

17. Aptitude à recevoir et à répondre à des sources d'information diverses (textuelles, numériques, verbales et graphiques) ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

18. Connaissance fondamentale de toutes les applications professionnelles de l'architecture en tant que domaine de connaissance ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

19. Responsabilité dans le travail personnel et aptitude à l'autocritique ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

20. Connaissance des langues ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

Autre:

Questionnaire Partie 2: Compétences spécifiques en relation avec la profession

1. Aptitude à créer des projets architecturaux satisfaisant à la fois à des exigences esthétiques et techniques ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

2. Connaissance adéquate de l'histoire et des théories de l'architecture, des arts, technologies et sciences humaines en rapport ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

3. Prise de conscience des problèmes et des questions du débat actuel en architecture Titulaire de Bachelor ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

4. Aptitude à reconnaître et à utiliser de manière appropriée théories, concepts, exemples et principes architecturaux ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

5. Connaissance des Beaux Arts comme influence sur la qualité du projet architectural Titulaire de Bachelor ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

6. Connaissance des travaux contemporains et historiques qui ont établi les normes optimales en architecture ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

7. Aptitude à isoler et à présenter éléments et relations clés ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

8. Connaissance adaptée du projet urbain, de la planification et des compétences impliquées dans le processus de la planification urbaine ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

9. Compréhension des rapports homme/bâtiment, bâtiments / environnements et de la nécessité de lier les bâtiments et les espaces publics aux besoins humains et à l'échelle humaine ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

10. Prise de conscience des potentiels des nouvelles technologies ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

11. Compréhension de la profession d'architecte et du rôle des architectes dans la société, en particulier dans la préparation de programmes prenant en compte les facteurs sociaux ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

12. Prise de conscience critique des motivations politiques et financières en regard de la demande des clients et du droit de la construction afin de développer un cadre éthique pour la prise de décision dans l'environnement construit ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

13. Prise de conscience critique de la relation existant entre les développements contemporains et passés en architecture ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

14. Compréhension des méthodes d'enquête et de préparation d'un programme de projet ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

15. Compréhension de la structure, de la construction et des problèmes techniques liés au projet d'architecture ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

16. Connaissance appropriée des problèmes physiques, des technologies et du fonctionnement des bâtiments pour le confort intérieur et la protection climatique ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

17. Compétences nécessaires en matière de projet pour répondre aux contraintes imposées par les facteurs coût et droit de la construction ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

18. Connaissance appropriée des industries, organisations, réglementations et procédures impliquées dans la traduction des concepts du projet dans des constructions et des plans intégrés à une planification totale ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

19. Aptitude à travailler à la fois avec une grande autonomie et à collaborer ☐

Titulaire de Bachelor: 1 2 3 4

Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues: 1 2 3 4

Titulaire de Doctorat: 1 2 3 4

20. Aptitude à s'engager dans l'autogestion et dans l'apprentissage longue durée (ex: travail indépendant, gestion du temps et capacité d'organisation) ☐

Titulaire de Bachelor: 1 2 3 4

Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues: 1 2 3 4

Titulaire de Doctorat: 1 2 3 4

21. Prise de conscience de la nécessité d'un développement professionnel continu ☐

Titulaire de Bachelor: 1 2 3 4

Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues: 1 2 3 4

Titulaire de Doctorat: 1 2 3 4

22. Aptitude à répondre d'une manière créative et flexible aux changements dans l'environnement professionnel ☐

Titulaire de Bachelor: 1 2 3 4

Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues: 1 2 3 4

Titulaire de Doctorat: 1 2 3 4

23. Aptitude à communiquer d'une manière appropriée avec une variété d'audiences dans des formes orales, écrites et graphiques ☐

Titulaire de Bachelor: 1 2 3 4

Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues: 1 2 3 4

Titulaire de Doctorat: 1 2 3 4

Autre:

Questionnaire Partie 3: Compétences spécifiques en relation avec la recherche en architecture1. Prise de conscience de la nature permanente de la recherche et du débat ☐

Titulaire de Bachelor: 1 2 3 4

Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues: 1 2 3 4

Titulaire de Doctorat: 1 2 3 4

2. Prise de position critique de la relation entre le discours architectural actuel et la pratique et l'architecture du passé ☐

Titulaire de Bachelor: 1 2 3 4

Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues: 1 2 3 4

Titulaire de Doctorat: 1 2 3 4

3. Prise de conscience des standards les plus élevés en architecture, en design, en espace bâti et dans le cadre académique ☐

Titulaire de Bachelor: 1 2 3 4

Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues: 1 2 3 4

Titulaire de Doctorat: 1 2 3 4

4. Prise de conscience des problèmes moraux et éthiques de l'enquête et de la nécessité de codes professionnels dans la conduite de la recherche (ex. reconnaissance appropriée des contributions etc.) ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

5. Aptitude à définir les thèmes de la recherche qui contribueront à la connaissance et au débat au sein de l'architecture ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

6. Aptitude à formuler des questions de recherche ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

7. Aptitude à identifier et à utiliser des exemples, théories, concepts et méthodes d'enquête appropriés à la discipline et au thème de l'enquête ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

8. Aptitude à identifier et à utiliser de manière appropriée les sources de l'information, à identifier et à utiliser des instruments appropriés de repérage (sources bibliographiques, inventaires d'archives etc) ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

9. Aptitude à préparer, développer, interpréter et présenter des termes en utilisant des techniques qualitatives et quantitatives ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

10. Aptitude à travailler avec un degré d'autonomie élevé (ex. accepter la responsabilité en matière de planification du projet de recherche) ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

11. Aptitude à communiquer efficacement sous forme écrite, orale et graphique ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

12. Prise de conscience et aptitude à utiliser les instruments appropriés des autres sciences humaines et physiques (ex. critique littéraire, histoire de l'art, philosophie, études sur l'analyse de construction etc.) ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

13. Aptitude à utiliser la technologie informatique et les ressources Internet (méthodes statistiques, cartographiques, création de bases de données, etc.) ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

14. Aptitude à recueillir et à intégrer des évidences pour formuler et tester des hypothèses ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

15. Aptitude à projeter, conduire une enquête et à en rendre compte ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

16. Aptitude à écrire dans sa propre langue, en utilisant correctement les diverses formes de la littérature architecturale ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

17. Aptitude à se reporter de manière précise et appropriée à des sources de référence ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

18. Aptitude à évaluer l'évidence et à tirer des conclusions appropriées ☐

Titulaire de Bachelor:	1	2	3	4
Titulaire de Masters ou de diplôme sanctionnant 4 à 6 années d'études continues:	1	2	3	4
Titulaire de Doctorat:	1	2	3	4

Autre:

Questionnaire on Competences of Graduate Architects

Dear Sir / Madame

The European Network of Heads of Schools of Architecture (ENHSA) is a project initiated by the European Association for Architectural Education (EAAE) in the framework of the Socrates Programme: "Thematic Networks". This initiative aims at helping schools of architecture to better and more effectively integrate in the New European Higher Education Area.

With this questionnaire we are trying to investigate the skills and competences that may be important for success in the professional career of a graduate Architect in the domain of your professional activity. It is expected that the outcome of this inquiry will give to the schools of architecture in Europe a tool which will help them to better articulate their educational objectives.

Learning outcomes and competences are the most relevant elements in the design, construction and assessment of qualifications ensured by schools of architecture, as they constitute the reference points to be met. By learning outcomes we mean the set of competences including knowledge, understanding and skills that a learner is expected to have/develop/demonstrate after completion of a process of learning – short or long.

We kindly ask you to fill this questionnaire and to support the efforts we are making in the framework of the EAAE/ENHSA Socrates Thematic Network. For any additional information and clarification please contact us.

On behalf of the EAAE Council and the ENHSA Steering Committee

As. Prof. Dr. Constantin Spiridonidis

ENHSA Coordinator

A. Please answer the following questions:

Click the appropriate boxe(s) or select from the proposed list

1. Type of the activity of your Company/Practice:

- Architectural Design ☐
- Interior Design ☐
- Object / Industrial Design ☐
- Scenography ☐
- Urban Design ☐
- Urban Planning ☐
- Building Conservation/Restoration ☐
- Building Construction ☐
- Construction Management ☐
- Other ☐ Please specify:

2. Number of employees of your Company/Practice:

3. Your position in the Company/Practice

- Director ☐
- Line Manager ☐
- Specialised Employee ☐
- Other ☐ Please specify:

4. Age

<30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ >60 ☐

5. Do you consider that the formal education of architect(s) employee(s) has adequately prepared them to work in your Company/Practice?

- Very much ☐
- Much ☐
- Some ☐
- Little ☐
- Very little ☐

6. Do you prefer your employees to have

- Specialised knowledge on the subject(s) of your Company/Practice ☐
- General multidirectional architectural knowledge ☐

B. For each of the skills listed below, please estimate:

the importance of the skill or competence, in your opinion, for work in your Company/
Practice by clicking the appropriate box;

the level to which each skill or competence is developed by degree programmes at the
School(s) of Architecture by clicking the appropriate box.

Please use the following scale: 1 = none; 2 = weak; 3 = considerable; 4 = strong.

1. Ability to work in an interdisciplinary team

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

2. Ethical commitment

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

3. Capacity to develop an analytical and critical thinking and understanding

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

4. Personal and social skills in expression and communication by speaking, writing and sketching

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

5. Ability to work both with a high degree of autonomy and collaboration

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

6. Ability to develop a trans-disciplinary understanding

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

7. Capacity to apply knowledge in practice

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

8. Capacity to generate creatively new ideas and forms

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

9. Capacity to apply a spirit of analysis and synthesis of ideas and forms

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

10. "Learning to learn" ability

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

11. Ability to evaluate evidence and draw appropriate conclusions

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

12. Awareness of and respect for points of view deriving from other national and cultural backgrounds

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

13. Ability to receive and respond to a variety of information sources (textual, numerical, verbal and graphical)

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

14. Awareness of the issues and themes of present day architectural debate

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

15. Ability to plan, conduct and report on investigations

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

16. Critical awareness of the political and financial motivations behind clients' briefs and building regulations so as to develop an ethical framework for decision making within the built environment

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

17. Basic knowledge of all the professional applications of the discipline of architecture

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

18. Decision – making and management skills

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

19. Planning and time management skills

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

20. Ability to create architectural designs that satisfy both aesthetic and technical requirements

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

21.Necessary design skills to meet building users' requirements within the constraints imposed by cost factors and building regulations

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

22. Understanding of the methods of investigation and preparation of the brief for a design project

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

23. Adequate knowledge of the history and theories of architecture and related arts, technologies and human sciences

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

24. High level computing skills including the ability to use the Internet critically as a means of communication and a source of information

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

25. Knowledge of languages

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

26. Understanding of the structural design, construction and engineering problems associated with building design

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

27. Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climate

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

28. Awareness of and respect for energy and sustainability management

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

29. Adequate knowledge of urban design, planning and the skills involved in the planning process

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

30.Adequate knowledge skills involved in the conservation and restoration of buildings

Importance:	1	2	3	4
Level to which developed by the School of Architecture:	1	2	3	4

31. Adequate knowledge and skills involved in landscape design

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

32. Adequate knowledge and skills involved in interior design

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

33. Adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

34. Ability to identify and use appropriately sources of relevant information and to identify and use relevant retrieval tools (bibliographical sources, archival inventories, etc.)

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

35. Other:

Importance: 1 2 3 4

Level to which developed by the School of Architecture: 1 2 3 4

C. Please rank below the five most important competences listed on the previous pages (section B)

Please write the number of the item within the box. Mark on the first box the most important, on the second box the second most important and so on.

1. Competence number:

2. Competence number:

3. Competence number:

4. Competence number:

5. Competence number:

Questionnaire concernant le niveau des compétences des architectes diplômés

Madame, Monsieur,

Le Réseau Européen des Directeurs des Ecoles d'Architecture (ENHSA) est un projet mis en place par l'Association Européenne pour l'Enseignement de l'Architecture (AEEA) dans le cadre du Programme Socrate : « Réseaux Thématiques ». Cette initiative a pour objectif d'aider les écoles d'architecture à s'intégrer de façon plus efficace au nouvel espace européen de l'enseignement supérieur et de la recherche.

Avec ce questionnaire, nous essayons de rechercher les compétences et les savoir faire qui sont importants pour le succès de la carrière des architectes diplômés dans le domaine de votre activité professionnelle.

Nous pensons que les résultats de cette enquête fourniront aux écoles d'architecture un instrument qui les aidera à mieux articuler leurs objectifs éducatifs.

Résultats d'apprentissage et compétences sont les éléments les plus appropriés dans la conception, la construction et l'évaluation des qualifications assurées par les Ecoles d'Architecture, puisqu'ils constituent les points de référence que l'on doit y rencontrer. Par résultats d'apprentissage nous entendons l'ensemble des compétences, y compris la connaissance, la compréhension et les capacités qu'un apprenant est tenu de connaître/comprendre/montrer après avoir accompli un processus d'apprentissage court ou long.

Nous vous demandons de bien vouloir remplir le présent questionnaire et de soutenir les efforts que nous faisons dans le cadre de AEEA/ ENHSA Socrate Réseau Thématique. Pour tout renseignement complémentaire et tout éclaircissement, n'hésitez pas à nous contacter.

Merci par avance de votre coopération et de votre aide

Pour le conseil de l'AEEA et le comité de coordination ENHSA

As. Prof. Dr. Constantin Spiridonidis

Coordinateur ENHSA

A. Merci de répondre aux questions suivantes:

Cliquez sur la case appropriée ou choisissez dans la liste proposée

Pays:

Ville:

1. Type d'activité de votre société/agence:

Projet architectural ☐

Design intérieur ☐

Design industriel et d'objet ☐

Scénographie ☐

Projet urbain ☐

Urbanisme ☐

Conservation/Restauration de bâtiments ☐

Construction ☐

Management de la construction ☐

Autre ☐ Précisez svp:

2. Nombre d'employés dans votre société/agence:**3. Votre place dans votre société/agence**

Directeur ☐

Responsable de service ☐

Employé qualifié ☐

Autre ☐ Précisez svp:

4. Votre age

<30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ >60 ☐

5. Considérez-vous que la formation des architectes que vous employez est suffisante pour leur permettre de travailler efficacement dans votre société/agence

Tout a fait suffisante ☐

Suffisante ☐

Assez suffisante ☐

Peu suffisante ☐

Très peu suffisante ☐

6. Vous préféreriez que vos employés possèdent:

Une connaissance spécialisée du domaine de votre société/agence ☐

Une connaissance architecturale générale et multidirectionnelle ☐

B. Pour chaque compétence de la liste suivante, merci d'évaluer:

L'importance du savoir et des compétences pour travailler dans votre société/agence.
(Cliquez sur le cercle appropriée);

Le niveau qui est assuré pour chaque compétence et savoir par la formation dans l'école d'architecture. (Cliquez sur le cercle appropriée)

Utilisez l'échelle suivant : 1 = très faible; 2 = faible; 3 = satisfaisant; 4 = élevé.

1. Capacité à travailler au sein d'une équipe interdisciplinaire

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

2. Engagement éthique

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

3. Capacité à développer une pensée et une compréhension analytiques et critiques

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

4. Compétences personnelles et sociales d'expression et de communication (oral, écrit, graphique)

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

5. Aptitude à travailler avec un degré d'autonomie élevé

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

6. Capacité à développer une compréhension transdisciplinaire

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

7. Capacité à mettre les connaissances en pratique

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

8. Capacité à produire de nouvelles idées et de nouvelles formes de manière créative

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

9. Capacité à appliquer un esprit de synthèse des idées et des formes

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

10. Aptitude à "apprendre à apprendre"

Importance: 1 2 3 4

Niveau assuré pour chaque compétence par la formation dans l'école d'architecture: 1 2 3 4

11. Aptitude à évaluer l'évidence et à tirer des conclusions appropriées

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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12. Prise de conscience et respect de points de vue issus d'autres environnements culturels et nationaux

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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13. Aptitude à recevoir et à répondre à des sources d'information diverses (textuelles, numériques, verbales et graphiques)

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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14. Prise de conscience des problèmes et des questions du débat actuel en architecture

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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15. Aptitude à projeter, conduire une enquête et à en rendre compte

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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16. Prise de conscience critique des motivations politiques et financières en regard de la demande des clients et du droit de la construction afin de développer un cadre éthique pour la prise de décision dans l'environnement construit

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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17. Connaissance fondamentale de toutes les applications professionnelles de l'architecture en tant que domaine de connaissance

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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18. Capacité à prendre des décisions et capacité de management

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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19. Capacité à planifier et à gérer le temps

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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20. Aptitude à créer des projets architecturaux satisfaisant à la fois à des exigences esthétiques et techniques

Importance:	1	2	3	4
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Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4
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21. Compétences nécessaires en matière de projet pour répondre aux contraintes imposées par les facteurs coût et droit de la construction

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

22. Compréhension des méthodes d'enquête et de préparation d'un programme de projet

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

23. Connaissance adéquate de l'histoire et des théories de l'architecture, des arts, technologies et sciences humaines en rapport

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

24. Haut niveau de compétences informatiques (utilisation critique de l'Internet comme moyen de communication et source d'information)

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

25. Connaissance des langues

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

26. Compréhension de la structure, de la construction et des problèmes techniques liés au projet d'architecture

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

27. Connaissance appropriée des problèmes physiques, des technologies et du fonctionnement des bâtiments pour le confort intérieur et la protection climatique

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

28. Conscience et prise en compte des questions de l'énergie et du développement durable

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

29. Connaissance adaptée du projet urbain, de la planification et des compétences impliquées dans le processus de la planification urbaine

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

30. Connaissance appropriée de la conservation et restauration des bâtiments

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

31. Connaissance appropriée de l'architecture du paysage

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

32. Connaissance appropriée de l'architecture intérieure

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

33. Connaissance appropriée des industries, organisations, réglementations et procédures impliquées dans la traduction des concepts du projet dans des constructions et des plans intégrés à une planification totale

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

34. Aptitude à identifier et à utiliser de manière appropriée les sources de l'information, à identifier et à utiliser des instruments appropriés de repérage (sources bibliographiques, inventaires d'archives etc)

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

35. Autre:

Importance:	1	2	3	4
Niveau assuré pour chaque compétence par la formation dans l'école d'architecture:	1	2	3	4

C. Classez les cinq compétences les plus importantes de la liste précédente (section B)

Inscrire le chiffre dans la case correspondante. Notez la compétence la plus importante dans la première case et ainsi de suit.

1. Compétence numéro:
2. Compétence numéro:
3. Compétence numéro:
4. Compétence numéro:
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