

## **Interdisciplinarity: University's answer to the needs of the labor market**

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### **Abstract**

*Within advanced economies, there is a general concern that teaching and research within higher education institutions are not directed towards specific objectives. One of the fields where this demand is clearest is labor market. In this paper, I argue that universities answer to the demands of labor market by implementing interdisciplinarity in order to provide their students with the chance to gain relevant skills and competences, which will enhance their possibility to be “employable”. These new skills and competences can be considered as a response to the new jobs which will be created in the future.*

### **Keyword**

*Labor Market, University, Interdisciplinarity, Employability.*

### **Introduction**

Despite frequent ivory tower characterizations, the history of the university as an institution reveals evidence of a deep engagement with broader society and on-going power disputes over internal versus external control (Mintrom 2008:231). In recent times, universities around the world have been subjected to new manifestations of these

external pressures. Firstly, funders-especially governments-have required universities to better demonstrate their social and economic contribution. Secondly, with growing recognition being given to the central role now played by knowledge in promoting economic advancement, stakeholders from many sectors of society have looked to universities to engage more closely with the world of business and commerce. Thirdly, the set of processes commonly bundled together under the heading of globalization have created dynamics that highlight the internationalized nature of competition for academic talent, quality students and, increasingly, research funding (Marginson 2004:2).

Universities, in trying to handle these pressures, maintain the quality of the higher education system and meet their students' needs, adopt and implement interdisciplinary research practices in order to provide their students with the chance to gain relevant skills and competences, which are in demand in the labor market.

Given the above considerations, the principle objective of this paper is to provide an understanding of interdisciplinarity, which is considered to be a kind of pressure exerted on higher education institutions by external factors. Among other reasons, universities adopt this kind of knowledge production in order to respond to societal needs and - especially-to labor market needs. The secondary objective is to show how skills and competences which are acquired through interdisciplinary post-graduate programs, can meet the needs of the marketplace, where work conditions have changed dramatically. Interdisciplinary curricula seem to provide students with these skills and improve their employment prospects.

This article has three parts. The first discusses the term "interdisciplinarity" which is considered to be the higher education institutions' response to the changing context in relation to teaching and research. The second expands upon the discussion of

interdisciplinary skills and competences on the one hand, and employability and work conditions in the labor market on the other. In the final part we try to link interdisciplinarity with employability through skills and competences. This part is the result of our research in Greek Universities at post-graduate level.

### **Understanding interdisciplinarity**

Trying to present a definition of interdisciplinarity is difficult. The different expressions introduced in the 1960s in order to describe different kinds of co-operation such as multidisciplinary, crossdisciplinarity and transdisciplinarity, have mostly been either abandoned or are now used as synonyms. There is, however, a tendency to use the word multidisciplinary to denote co-operation between disciplines, in which no attempt at integration is made, where each discipline retains its point of view and is not enriched by any of the other disciplines. Kockelmans (1979) argues that interdisciplinary work integrates techniques and theories into common ground. Integration is the degree to which the disciplines are woven together from two (or more) separate disciplines, or sub-disciplines, into a single larger discipline. Integrated courses go beyond simply presenting material from different disciplines within a course. They merge the disciplines, thus demonstrating how they are interrelated, and how understanding each discipline enhances one's understanding of the other and the questions that each seeks to address.

The importance of interdisciplinary research is widely recognized, since cross-disciplinary research is associated with creativity, progress and innovation, and many "breakthroughs" of modern times were obtained by crossing disciplinary boundaries. Cross-fertilization across different disciplines has been described as a key element in

the advancement of science. Moreover, many of society's major problems, such as environmental issues, require integrative approaches from different disciplines. Meanwhile, studies on interdisciplinarity from all possible perspectives are increasingly demanded. Therefore, interdisciplinary collaboration capitalizes on a diversity of perspectives and practices that each discipline offers in the hopes of providing innovative solutions to multifaceted problems.

According to Gibbons et al. (1994) this new knowledge production (Mode 2) is carried out in the context of application. By contrast, in Mode 1 (the traditional disciplinary mode) the context is defined in relation to the cognitive and social norms that govern basic research or academic science. Mode 2 is created in broader social and economic contexts and is intended to be useful whether in industry or government, or society more generally. In recent years, alliances between industries and universities have proliferated. On one level, these partnerships effectively provide universities with much needed funding sources as government support for research declines. Companies, in turn, are able to tap into knowledge at the frontier of science and achieve greater flexibility in funding their own research and development efforts. Moreover, growing public interest in issues to do with the environment, health, communications, privacy, procreation and so forth, have had the effect of stimulating the growth of knowledge production in Mode 2.

### **Interdisciplinary competences**

Universities, as the main realm of knowledge production - under these circumstances - are forced to grasp the "horns" of a dilemma: orientation of the curricula towards the fulfillment of market and societal needs, or the cognitive and social norms that govern

basic research and academic science. They seem to try to combine these two modes of knowledge production and teaching, incorporating into their curricula interdisciplinary programs at graduate and post-graduate level. This means that Mode 2 is not supplanting but rather supplementing Mode 1.

However, the educational training programs are characterized by strict disciplinary boundaries. Each educational program requires the identification of the core elements in the skills and competences needed within the respective professions. The identification of critical cross points between two or more professional competences becomes an additional requirement in educational programs aiming at interdisciplinary competences, as the design of an educational program represents a balance between depth and width, i.e. generalization and specialization. The concept of competence, therefore, becomes an important issue for interdisciplinary research. The literature on this concept is broad and encompasses many related issues, and covers various areas as well, from education and social sciences to the labor market<sup>1</sup>.

The majority of definitions describe competences as a combination of knowledge, skills and attitudes, which make it possible for someone to adequately solve a problem or do his “job”. Crick (2008: 313) believes that competences are broader than knowledge or skills, and are acquired in an ongoing, lifelong learning process across the whole range of personal, social and political contexts. Ten Dam and Volman (2007) present a similar understanding of the concept: for these scholars competence is a totality of knowledge, skills and attitudes that enables a person to perform tasks and solve problems within a specific social practice. Thus, competence is not so much about acquisition of separated knowledge, skills and attitudes, as about *how to integrate these in order to carry out*

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<sup>1</sup> The concept of competence has been thoroughly analyzed by Monika Rerak for the Karatheodori program of the University of Patras.

*social tasks*. Competences are connected to skills in the sense that they both include knowing and understanding (theoretical knowledge of an academic field, the capacity to know and understand), knowing how to act (practical and operative application of knowledge to certain situations) and knowing how to be (values as an integral element of the way we perceive and live with others in a social context) (Boni & Lozano 2005).

Interdisciplinary competences, as well as competences in general, contain the three interacting dimensions of knowledge, skills and attitudes. Knowledge primarily refers to the respective fields of knowledge that characterize each profile. The specific knowledge that is gained through an educational program constitutes the foundation of the respective professional roles. Yet, interdisciplinary competences also require an overall awareness of the knowledge fields represented by other, closely related, disciplines. The skills of specific importance in an interdisciplinary curriculum are represented by the ability to interact with people from different professional disciplines, e.g. the ability to communicate, coordinate, mediate compromise, convince, to convey your own knowledge and to assess input from other professionals.

The competence dimension of attitude implies the willingness of the students (and the professionals) to move from their professional field to another. Thus, knowledge and skills represent the dimension of competence that constitutes the basic role of a profession, while attitude is more closely related to interdisciplinary competence. As knowledge and skills gradually develop during an educational program, so does attitude.

Within an interdisciplinary program, each student is expected to demonstrate a high level of skills and competences, such as:

Academic Thinking Skills & Strategies

- Questioning critically and thinking creatively
- Solving problems effectively
- Making connections

#### Communication & Collaboration Skills

- Offering ideas and making contributions
- Working well with others
- Respecting and valuing others

#### Personal Attributes

- exhibiting a strong work ethic
- taking personal responsibility
- demonstrating resiliency

Competence literature also points to a relationship between higher education institutions and the world of work as early as the 1970s, when the findings of research on occupational flexibility suggested adjustable and not very strong relations between higher education and the labor market (Schaeper 2009). As a result of industrial restructuring and technological development, concern about a potential *mismatch between the needs of employers and competences* has been observed to develop in recent decades. Teichler (2007) suggests that there is also a growing conviction that higher education should play a stronger role in fostering *competences beyond systematic cognitive knowledge*, meaning those competences that are relevant for successful professional practice and are based to a limited extent on cognitive and systematic learning.

It is recognized in the competence literature that higher education provides students with competences that enable them to maintain their position in a changing professional environment. Vaatstra and de Vries (2007: 335-336) believe that generic, reflective and occupation-specific competences in particular benefit graduates in the long term and render them more “employable”. Students need to acquire competences during their studies which can be used flexibly in complex working situations. In an occupation-specific context all these competences should be combined if an individual wishes to handle non-routine and unusual, complex working. Boni and Lozano (2005) add that higher education institutions should not only provide the specific competences of each discipline, but also other general qualities to prepare the student for the working environment.

Although these competences are needed not only for a successful interdisciplinary endeavor, but also for fostering employability, the prevailing structures of universities constitute an obstacle to interdisciplinarity. Becher (1994:151) notes:

*Universities are composed of different tribes. Each tribe has a name and a territory, settles its own affair, goes to war with others, has a distinct language and a variety of symbolic ways of demonstrating its apartness from others.*

It becomes obvious that universities have difficulties in incorporating interdisciplinarity into their structures. On the one hand, pressures from external factors (EU, International Organizations etc) are exerted upon universities to adopt interdisciplinarity, but on the other, universities with traditional structures are not ready to bow to such pressure.

The question is: where do Greek universities fit into this?

### Greek universities and interdisciplinarity

We wanted, as part of our research, to find out how Greek Universities have responded to the challenge of interdisciplinarity. We searched on the internet, visiting the official websites of Greek Universities, where we found the programs for the Postgraduate Studies which are offered. This research, however, has several limitations, as these web sites do not always give precise and updated information. However, we created one list with the total number of Postgraduate Programs, and another one, with the number of programs which are organized by more than one Department or by more than one university.

**Table 1: Interdepartmental – interuniversity programs (2010-2011)**

<b>Universities</b>	<b>Total Number of Programs</b>	<b>Interdepartmental – interuniversity programs</b>	<b>Percentage</b>
Patras	42	17	40,4
Ioannina	40	23	57,5
Dimokriteio	24	8	33,3
Aegean	27	3	11,1
Ionio	10	1	10
Xarokopion	4	0	
West Macedonia	6	2	33,3

Thessaly	31	5	16,1
Agricultural	10	2	20
Economics and Business-Athens	20	9	45
Piraeus	17	2	11,7
Crete	40	11	27,5
Panteion	14	1	7,1
Technical University- Crete	7	1	14,3
Macedonia	13	6	46,1
National and Kapodistrian	96	39	40,6
National Technical University	28	28	100
Aristotle-Thessaloniki	65	15	23
<b>Total</b>	<b>494</b>	<b>174</b>	<b>35,2</b>

This web-based research indicates that Greek Universities currently run 174 interdisciplinary/interdepartmental programs at post-graduate level-more than almost 1/3 of the total number of post-graduate programs. This reveals that Greek universities

are gradually adapting to the new mode of knowledge production and teaching. We must also take into consideration that most of them were established after 1993, when EPEAEK (Operational Program for Education and Initial Training) financed their operation. It is interesting to quote a paragraph, regarding the steps for submitting a proposal, to find out how EPEAEK urges universities to couple education with employment, by offering interdisciplinary programs:

*The general objectives of 2<sup>nd</sup> Action Line are:*

*Coupling of education and employment by developing alternative forms of lifelong learning. Development of occupational guidance and counseling as well as the extension of internship and development of skills programs.*

*Reformation of the initial vocational training and higher education curriculum so that essential knowledge and skills can be provided, increasing, in that way, young peoples' opportunities for employment and integration into the labor market<sup>2</sup>.*

The evaluation process of submitted proposals is based on objective criteria and requirements, such as the promotion of interdisciplinarity at post-graduate level.

Accordingly, a submitted proposal will be funded, when:

- 1. a program is organized by more than one Department*
- 2. the cooperation of the participants is ensured*
- 3. a program focuses on areas such as Biotechnology, Genetics, Biomedicine etc.*

The Ministry of Education, in trying to achieve enhanced quality and national research competitiveness, also promotes interdisciplinary research and teaching. Recently, on 27-

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<sup>2</sup> [http://www.epeaek.gr/epeaek/en/a\\_1\\_2.html](http://www.epeaek.gr/epeaek/en/a_1_2.html)

07-2011, in the draft bill for the reformation of Higher Education<sup>3</sup>, the Ministry stimulates and supports faculty initiatives to launch interdisciplinary programs or respond to the increasing number of agencies and stakeholders that endorse and indeed require such a perspective. The adoption of this perspective can lead to the creation of new organizational structures that span or alter conventional discipline boundaries. It can, also, serve as a signal to faculty, students, administrators and external parties that the university is ready and willing to accommodate an evolving and, at times, rapidly changing, configuration of knowledge.

Thus, the first issue is whether or not Greek Universities select interdisciplinarity as a strategy; the second issue is whether they effectively implement this strategy. According to our findings, the answer to the first question is taken as yes; what is of interest is whether Greek Universities can put plans into action. The answer here is mixed<sup>4</sup>.

### **From interdisciplinary to employability**

The current global financial crisis is spreading quickly in the markets, but little is known about its impact on institutions such as universities. Researchers usually focus on how the crisis has affected the nature of public funding and not on its effects on teaching and research as core university activities. In times of financial constraint universities face further pressures in the form of a growing demand for higher education. Rising unemployment levels drive more people into seeking education to increase their competitiveness in the labor market. In many countries (EUA 2011) this has led to reduced spending per student. The combination of growing student numbers

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<sup>3</sup><http://www.minedu.gov.gr/grafeio-typou/anakoinoseis-typoy/22-07-11-nomosxedio-gia-ti-ldomi-leitoyrgia-diasfalisi-tis-poiotitas-ton-spoydon-kai-diethnopoisi-ton-anotaton-ekpaideytikon-idrymatonr.html>

<sup>4</sup> This issue is part of our PhD dissertation

and reduced spending represents a major concern for maintaining the quality of higher education.

The paper's central thesis is that universities, in trying to maintain the quality of the higher education system and meet their students "needs" adopt and implement interdisciplinary research practices in order to provide their students with the chance to gain relevant skills and competences, which are in demand in the labor market. In this way, students, after having graduated, will be more likely to be "employable".

If the notion of employability is to contribute to the quality of higher education, it is rather important to disentangle competing preconceptions about what it is and how it might be promoted. Employability is rarely defined explicitly and clearly. There are several implicit definitions in the literature. In all cases the core notion relates to the propensity of a student to obtain a job (Harvey 2001: 98). In general terms, employability is defined as having the skills and abilities to find employment, remain in employment or obtain new employment, as, and when, required. More specifically, employability can be seen as "a psycho-social" construct embodying a range of individual characteristics that facilitate adaptive behavior necessary to maintain ongoing employment within rapidly changing employment environments. Alternatively, it can be seen as a function of the labor market context with labor supply and demand determining an individual's employability at any given time (Crossman & Clarke 2009: 602).

In the higher education sector, despite debate over how it should be defined and measured, graduate employability has become a critical benchmark for measuring performance at both individual and institutional level. Interest in graduate employability has arguably produced benefits for all stakeholders including universities, governments,

employers and graduates themselves. From a government and employer perspective, employability is mainly concerned with ensuring that graduates are capable of contributing to “economic competitiveness in a global context”. To achieve this, degrees and post graduate programs now tend to focus on the acquisition of two types of skills: critical subject specific knowledge and skills and transferable knowledge, skills and attitudes. Transferable skills include oral communication, high level learning skills, problem solving, decision making, and affective skills and traits such as responsibility, a positive attitude, interpersonal skills and the ability to work both in a team and independently (Cassidy 2006:509). By shifting the focus towards graduate employability rather than knowledge acquisition, universities have acknowledged the need for graduates to develop a range of personal and intellectual skills beyond specific expertise in an academic discipline, although the extent to which this is achieved at a practical level remains open to debate.

Furthermore, although universities and other organizations have a role to play in supporting employability, both employees and employers now see responsibility for employability resting with the individual. According to Fugate et al. (2004:15) “the onus is on employees to acquire knowledge, skills and abilities and other characteristics valued by current and prospective employers” in order to maintain employability in both current and future employment contexts. Fejes (2010:90) gives another dimension to employability, saying that this term is used as an explanation, and to some extent a legitimization, of unemployment. This dimension holds the citizen responsible for his/her own unemployment, and less emphasis is placed on structural inequalities and problems in the labor market. For graduates this transfer of responsibility means that employers are now looking for people who can demonstrate a range of knowledge and

skills relevant to the position as well as adaptive behavior that will enable them to perform in new and often complex work environments.

### **European Employment Strategy Framework: Employment first.**

Since the 1970s, western European countries have had to deal with steadily high rates of unemployment. In an attempt to overcome this problem, the 1997 Treaty of Amsterdam made employment policy a “matter of common concern” and called upon Member States to co-ordinate their employment policies. The European Employment Strategy, a broad soft law framework of policy guidelines meant to serve as a platform for long-term voluntary policy convergence and the exchange of best practices between Member States in the employment field, was agreed upon later on in 1997 in a Special Jobs Summit held in Luxembourg (Goetschy 1999).

From 1997 to 2002, the EES involved agreement of Member States on a set of annual Employment Guidelines. Around twenty Guidelines were normally adopted each year, which were placed under the four “pillars” of employability, entrepreneurship, adaptability and equal opportunities. Despite frequent reviews of the guidelines throughout the lifetime of the EES, its core philosophy has not undergone significant changes. “Employability” has been said to be “at the heart” of the European Employment Strategy. Being employable means being expected to render and maintain oneself competitive in the labor market, that is, to possess appropriate competencies and skills, as well as to be flexible and willing to continue to learn throughout one’s lifetime.

The ideational effects of EES employability policy discerned in national employment policies when some or all of the following ideas and norms are introduced in national policy discourse:

1. a normative shift from “passive” to “active” measures (e.g. from unemployment benefits to active labor market policies)
2. new emphasis on strengthening links between education and work
3. the introduction of the concept of “life-long learning”
4. emergence of arguments in favor of making work pay (limiting passive measures’ generosity and length)
5. Emphasis on “activating” remaining passive measures (Tsakatika 2009:4).

EU (EC, 2007:11) also urges Member States to provide conditions conducive to employment creation and growth.

*“In particular, Member States should: renew impetus in tax and benefits reforms to improve incentives and to make work pay; increase adaptability of labor markets combining employment flexibility and security; and improve employability by investing in human capital”*

The focus on human capital is a central issue. Citizens must be offered the opportunity to enrich their human capital so as to find a job more easily. Similar ideas can be found in the OECD (1998:3) employment policy.

*“as we move into ‘knowledge-based’ economies the importance of human capital becomes even more significant than ever. Together with business and individuals, public authorities share a common interest in renewing and increasing the skills base of the population and workforce. Human capital thus constitutes an intangible asset with*

*the capacity to enhance or support productivity, innovation and employability. It may be augmented, or may decline, or become redundant. It is formed through different influences and sources including organized learning activity in the form of education and training. Knowledge, skills, competences and other attributes combine in different ways according to the individual and the context of use”*

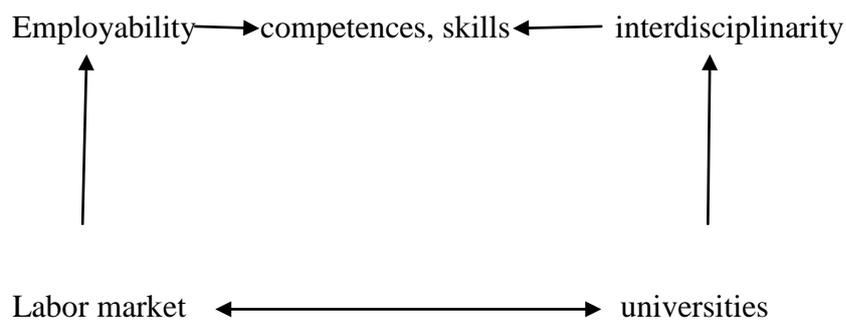
The link of employability to human capital is obvious. The European Commission (2008:3) argues that, as financial crisis threatens the global economy, it is essential to enhance human capital and employability by upgrading skills. But upgrading skills is not enough: ensuring a better match between the supply of skills and labor market demand is just necessary. Due to imperfect information and structured rigidities, workers and businesses are not provided with the right level of skills in the right areas, which damages competitiveness. The educational and professional choices of young men and women continue to be influenced by traditional gender paths.

Therefore, skills which are in demand in the labor market are needed, and not academic skills in general. Who is in charge of offering and developing these skills? The role of universities in this case is very important. Universities-according to the European University Association ( 2010:58)- should better address students’ needs. They should redesign their curricula to stimulate the growth of interdisciplinarity and optional courses in a study program, thus increasing the potential of innovative studies that can better address each student’s interests and potentially enhance employment opportunities.

The terms ‘skills, competences, abilities’ are not the main issue of this paper; they are considered to function as a ‘bridge’ between the labor market, where employability prevails, and universities, which are now offering more and more interdisciplinary

programs at post graduate level. In this paper we argue that this change must be interpreted as the universities' response to the demands of the labor market, which seeks employees with particular skills and competences. Universities implement interdisciplinary research and teaching in order to provide their students with these skills and respond to societal needs. This relation is illustrated better in the following figure.

**Figure 1: relation between labor market and universities**



## Methodology

Qualitative research was conducted in three Greek Universities to explore the perspectives of academics with regard to interdisciplinary competences and the labor market. We investigated seven interdepartmental/interdisciplinary post graduate programs:

University of Ioannina

1. Greek Philosophy- Philosophy of Sciences ( This program is organized by the Department of Philosophy, Education and Psychology in cooperation with the Department of Primary Education)
2. Biotechnology organized by the School of Medicine in cooperation with the Department of Chemistry)

#### University of Patras

1. Environmental Sciences (organized by the Department of Biology, in cooperation with the Departments of Geology, Mathematics, Chemistry and Physics)
2. Science and Technology of Polymers (organized by the Department of Physics, in cooperation with the Departments of Material Sciences, Chemistry and Chemical Engineering)
3. Medical Chemistry: Design and Development of Pharmaceutical products (organized by the Department of Chemistry, in cooperation with the Department of Pharmacy).

#### National Technical University

1. Protection of Monuments, Sites and Complexes: conservation and restoration of historic buildings and sites (organized by the Department of Architectural Engineering in cooperation with the Departments of Chemical Engineering, Civil Engineering and Rural and Surveying Engineering)

2. Environment and Development (organized by the Department of Rural and Surveying Engineering in cooperation with the Departments of Civil Engineering, Architectural Engineering, Chemical Engineering, Mechanical Engineering, Electrical and Computer Engineering, Mining Engineering and Metallurgy).

As is common in qualitative research, data was collected from participants via interviews (Strauss and Corbin 1994). Collecting data from interviews enabled the researcher to ‘enter into’ the perspective and experiences of others (Patton 2002:341) and involved the use of an interview guide with lists of questions to be explored in order to ensure that the basic lines of enquiry were addressed but also leaving the researcher free to explore, clarify or probe. The thematic analysis adopted was largely informed by constant comparative analysis, an analytical tool originally developed for Grounded Theory by Glaser and Strauss (1967).

### **Discussion of findings**

The data was treated as one source for analysis rather than being analyzed in discrete ways. However, any marked distinctions in findings within the analysis were noted. The discussion and findings section begins by referring to connections participants made between the labor market and employability and then subsequently highlights the perceived benefits.

*Interdisciplinarity is necessary*

Although participants do not share the same meaning of the concept of interdisciplinarity, they all agree that this means of knowledge production is the answer to societal problems and to the promotion of science. One academic said: *our research brings us into contact with people in diverse fields. Every meeting with them opens our eyes to new ideas and methods.*

As is evident from the participants' responses, the benefits of such collaborative interdisciplinary research are clear. But- they argue-it is not without problems. For example, two researchers working in different fields might have to get over initial shyness and admit they don't know a lot about the other's area. However, they say that this is where the strength of interdisciplinary research shows its full potential. Mixing such different ways of thinking is a great way to stimulate the generation of new approaches to a problem that neither group, or field, had thought of before. Without the collaboration of researchers from several different fields, many of today's important discoveries wouldn't have been possible. One of them posed a question: *Where would the Human Genome Project be without the help of the computer scientists and bioinformatics whose programs have helped to organize and annotate all that information?* Scientists are getting together, talking, and sharing ideas and the results are fascinating.

The results, however, from the implementation of these post graduate programs are not unanimously accepted. Some of the respondents said that these programs are multidisciplinary and not interdisciplinary. However, they all agreed that financing is the main issue for the proper functioning of the programs.

*Universities and the Labor Market*

The question here was about whether a link between universities and the labor market should exist. The answer was yes and no. No, because the attempt to link university output to labor market needs has proved an abject failure. First of all, labor market analysis is frequently tricky and politicians, driven by the election cycle, make decisions that simplify this analysis even further. They want to show their responsiveness to external factors and societal needs, but their decisions, in reality, serve neither the society nor the students' personality. Secondly, labor market needs become obsolete very easily. The kind of skills that are in demand today may very well not be in demand tomorrow.

On the other hand, it is arrogant to ignore underlying, long term trends. The effects of unemployment, globalization, the financial crisis and internationalization should be taken into consideration. Most interviewees say that universities and the government need to balance responsiveness with a clear understanding of the difference between long-term structural change in society and short-term volatility. Universities can serve the latter by building new interdisciplinary programs. The former is best served by ensuring that universities produce and disseminate knowledge and provide their students with the skills needed to practice a profession.

One of the participants thinks that the labor market supports moves towards privatization, arguing that this trend is dangerous for society as a whole, since it threatens the independence of universities. He also said that it is useless to make comments on this link between universities and the labor market in Greece, because in our country there is no such 'thing'. "*We produce nothing*" he said "*in other countries with a strong economy, such a question has a meaning*".

Although the answers are contradictory, they all admit that changes in the role of universities are occurring so rapidly that it has become almost impossible to make a sound assessment of current trends. But the discussion is also essential, and universities need to continue to participate in.

### Students' employability

All participants say that they care about their students' employment after studies. They describe how difficult it is today to find a job, even in fields (civil engineering, medicine) where finding a job was easy before. There was a time when simply being a graduate was enough to help you stand out in a crowd. Securing employment wasn't as tough, because there were fewer graduates in the same position. Regardless of actual ability, having a degree meant you were a notch above many. Today everything has changed. The financial crisis has exacerbated the situation and the labor market is crueler than ever. One participant said that, even though they run post graduate programs which could be financed by the private sector, they reject the offers, because they do not want to get paid, when their students are unemployed.

Of course, they admit, universities have been addressing issues related to employability for a long time. Some prefer the term employment instead of the term employability, but they recognize that the labor market determines one's chances of finding a job. They argue that employability implies the absolute flexibility of labor markets and the dismantling of labor regulation. As a place of learning, the university isn't solely about business and career.

Despite this, the majority of the respondents agree that the university should take into consideration their students' employability. That doesn't mean that a degree is an automatic passport to a job or a career. But universities must do everything to ensure

that they can facilitate their students' employability. To the question: how could universities help their students? The answer is: by reforming their curricula.

*Interdisciplinary programs: an answer to students' employability*

The data revealed that almost all participants made connections between interdisciplinary curricula and employability. In the view of one participant, a curriculum that could fulfill the criteria as required in the job market, could assist and make it easier for students to face challenges and to secure a place for themselves in employment. The perceived value of interdisciplinarity was also associated with observations that workplaces and practices were increasingly affected by global and international forces giving rise to implications that interdisciplinarity is an answer to them. A student in an interdisciplinary program gains additional skills, which are valuable to employers. Through interdisciplinary education, students have studied approaches from many disciplines, building detailed knowledge in some areas and integrating it into new means of reaching goals or solving problems. Some skills listed are:

Critical and Analytical Thinking skills:

- Analyzing problems in a way that considers unusual alternatives
- Making connections between things that discipline-oriented people wouldn't see
- Formulating different questions due to broader perspectives and forms of knowledge

Problem-solving skills:

- Working with others to research, develop plans, and implement solutions
- Brainstorming-recognizing that there is no one method that is superior

- Structuring unstructured problems

Communication skills:

- Mediating between disciplines
- Negotiating, persuading others
- Combining skills to reach people with different learning styles

These skills come as a result, when a student finishes his course. As one of the respondents noted:

*“The interdisciplinary nature of our studies is valuable not only for its immediate benefits to our research, but also for keeping the door open to diverse career paths in the sciences. It's the perfect introduction to the team-based approach common in industry, a career direction that many students at university eventually take. Not only does it give one the knowledge and the vocabulary to understand other disciplines, but it also provides the necessary communication skills. With the recent introduction of interdisciplinary training programs, and the increase in team-based and problem-based learning approaches, we are hopeful that today's crop of budding scientists will emerge from their training with an appreciation of a variety of disciplines and the ability to move among them effectively. It might not be long; in fact, before we see the lines between different fields start to blur even further than they have already”.*

This statement indicates how supportive academics are of interdisciplinarity, combining it with industry and career paths. However, as one described it, the relationship between post graduate students, institution and employer is not simple. Linear explanations are not enough. No matter how many interdisciplinary skills someone has, that doesn't open the door to a job. Jobs change rapidly. Different skills may be in demand in the future.

But for the time being, interdisciplinary skills –he added- are like an ‘umbrella’. They can cover the labor market’s demands.

Besides the changing circumstances of the workplace, participants also referred to the EU and its pressures on universities to adopt interdisciplinarity. The EU demands the type of competences required by the labor market be reflected in the curriculum of Higher Education. One speculated that the increasing number of changes in the labor market would lead to another type of career, that is, the so-called protean career. The epithet, protean, is etymologically derived from Proteus, the old Greek sea god, who could rapidly transform himself, when needed, into various shapes. Given the protean character of current careers, employability is important in the light of future employment opportunities. Skills which a student acquires through an interdisciplinary program are valued because they apply to many jobs and so can support common preparation to meet the needs of many different jobs.

An academic, who teaches on the program ‘Environment and Development’, gave an example; in the last semester all students must get involved in a project which requires the combining of different disciplines. This project is a proposal for the development of a specific area in Greece. Students from different disciplines cooperated as the project progressed. The interdisciplinary nature and extensive scope of the project provided a unique mechanism to introduce and review important technical and interpersonal skills necessary for employment. It also gave a sense of the responsibilities, and self-motivation that will be necessary for them to succeed in their future careers. Interaction with other students added a new dimension to scientific work. In contrast to programs which are framed in the discipline- specific context, this interdisciplinary project adopted an interdisciplinary approach to accounting knowledge and skills with a focus on work-integration. In the work-place, the range of disciplines is not clearly delineated

and so a multi/interdisciplinary approach best emulates the real world problems students are likely to encounter.

## **Conclusions**

The findings of the research suggest that from the participants' perspective there are clear associations between interdisciplinarity and employability. It is evident from the above discussion that there is a need, recognized by a growing number of universities, to move towards the employability of their students. The competition that universities face in recruiting students and their selectivity of institutions and courses is one factor, and the competitive employment market which those students enter, is another. Universities cannot ignore that the labor market and its flexible institutions based on short-term transactions and constantly shifting tasks, feel uneasy when their employees are able to handle adequately only one problem at a time, as they are trained in one discipline. It seems, thus, that Richard Sennett is right when he says that "craftsmanship" is on the decline. According to Sennett (2006:104-105), flexible organizations look for competences that tend to be applicable to a variety of domains and settings. These competences must be acquired fast, as deepening one's competences takes time. Nowadays problems must be solved within a limited amount of time and there is no time to think things out in any deep or complex matter. Interdisciplinary teaching and research offer the competences needed in the labor market, as they can be applied in many domains and they don't take much time to acquire.

Greek Universities seem to be responding to the growing demand to adopt interdisciplinarity, recognizing its importance for the promotion of knowledge, the solution of complex societal problems and the employability of their students. Of

course, it remains to be seen how this new knowledge production is implemented, but that is not an issue addressed by this paper<sup>5</sup>. Interdisciplinarity -as a challenge to universities- may be seen as an opportunity for change. Moreover, as Tsaousis says (1993:63), universities can react to every external pressure not by rejecting them, but by taking initiatives and developing practices in order to reform their structure and become useful to society.

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<sup>5</sup> How interdisciplinarity is implemented in Greek Universities, is the theme of my PhD dissertation.

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