

# INTERDISCIPLINARY EDUCATION AGENDA PROJECT: STUDENTS MOBILITY PROGRAMME

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## Abstract

The IDEA Project (InterDisciplinary Education Agenda) consists of an international network of EU HEIs (High Education Institutions) jointly working to contribute to innovation practices in education and academy-industry collaboration. The Universitat Politècnica de València (UPV) is one of the institutions participating. In this paper a brief introduction of the main aims of IDEA project is given. Besides, the work packages planned for the IDEA Project are listed. This paper focuses on the mobility work package (WP4) and describes the particular experience of the UPV as one of the hosting institutions. The activities carried out by the students during their stay in UPV are described.

Keywords: European Project, students mobility, Enterprise-University collaboration.

## 1 IDEA PROJECT

IDEA project Project (InterDisciplinary Education Agenda, an essential driver for innovation) [1] takes part on Tempus Programme (Trans European Mobility Programme for University Students) [2] and consist of 12 project members covering all stakeholders of the knowledge triangle: 10 Higher Education Institutions (HEIs), 1 technology transfer centre and 1 manufacturer's association. Amongst the HEIs there is the *Universitat Politècnica de València* (UPV) [3] . This paper focuses on the experiences put into practice in the IDEA in the UPV institution.

Particularly, in the UPV, the Research Centre on Production Management and Engineering (CIGIP) [4] and the Design Research and Management Group (IGD) [5] are participating. CIGIP is at the leading edge on enterprise modelling, manufacturing planning research, particularly manufacturing assembly, distribution and service supply chain management research issues. CIGIP gathers more than 30 members including professors, associate professors and full researchers dedicated to teaching and research & development in different areas of Enterprise Modelling and Operations and Production Management. From 1994 the CIGIP has participated in several European and Spanish Research Projects and several research & development contracts with regional industrial firms from different industrial sectors. On the other hand, the IGD group has been working for several years in the UPV. It is formed by lecturers, research fellows, students, and co-operators of several departments, and is open to all those members of the University community who wish to contribute and share knowledge and experience in support of the twin functions, which give the group its name. In other words, the group as a part of the University is propitiating cooperation among Departments, institutions, business and professionals. IGD understands that this cooperation is invigorating industrial and cultural activity through the perfect instrument of Design management, generating a culture appropriate to it and propitiating competitive industrial activity.

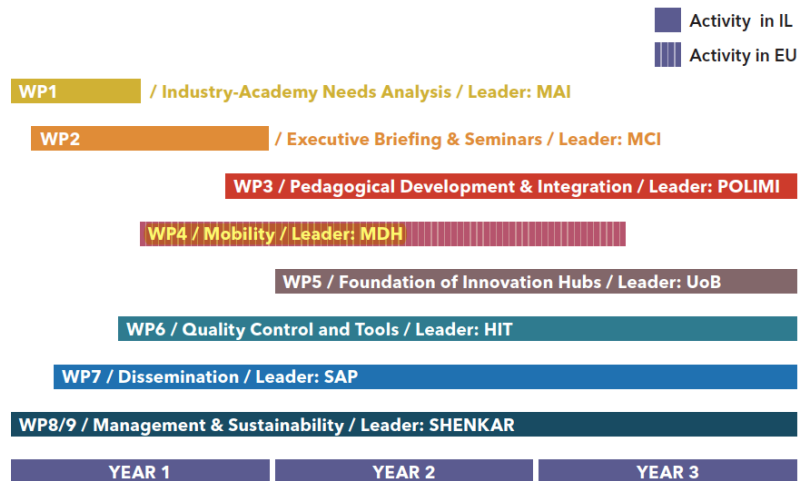
IDEA project address Israeli's National Priorities for 2012. In the light of this, the main activities to cover are: (i) identify the needs and gaps between industry and academy, (ii) introduce best practices from EU HEIs, (iii) support for an interdisciplinary innovation culture in the Israeli HEIs and (iv) create a sustainable knowledge transfer between industry and academy enhancing research and innovation.

According to this, the UPV, part of HEI instructors, contributes to the knowledge exchange as regards its experience in R&D projects involving the public and private sectors in Spain. The specific contributions of UPV as regards the IDEA project are to (i) participate on the development of the theoretical knowledge of innovation processes, (ii) introduce an interdisciplinary innovation management program involving academia and industry, (iii) host training for staff and internship for students in, (iv) supervise the creation of centres to promote research and innovation in the domains of design, engineering and business, (v) help on monitoring the project performance in a structured and methodological approach, and (vi) ensure sustainability of the project results within the academic and industrial partners and beyond the span of the project.

The IDEA project jointly with the supervision of UPV and the other HEIs will allow to effectively bridge the gaps within Education-Research-Innovation and support industries to deal with global economic challenges. Besides, academia-industry collaboration will be enhanced in the domain of innovation through the integration of knowledge among engineering, design and business disciplines.

## 2 WORK PACKAGES (WP) OF IDEA PROJECT

This section has its main aim on describing the phases carried out throughout the IDEA project, which are grouped in nine Work Packages.



**Figure 1.** Project planning overview: Work Packages.

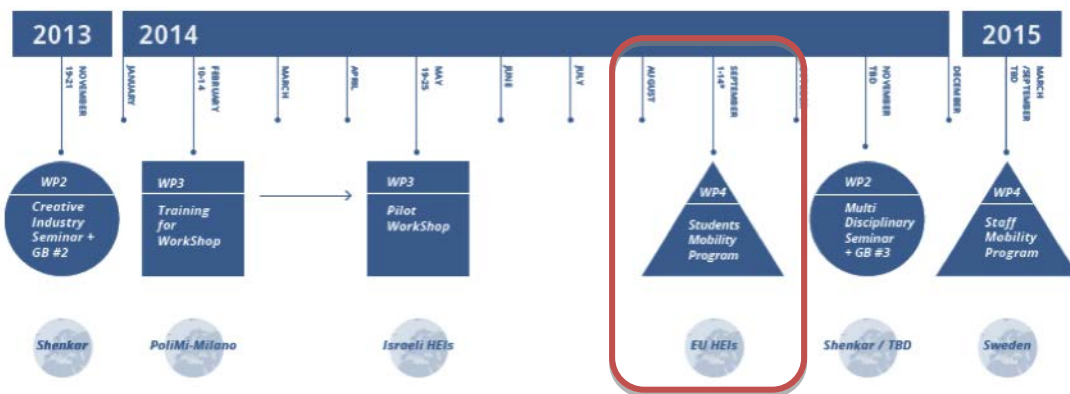
- WP1 Industry-Academy Needs Analysis: identification of requirements and gaps within the collaboration between the industry and academia. Research is applied and focused on Israeli SMEs.
- WP2 Executive Briefing And Seminars: Introduction of the theoretical knowledge of innovation processes. Development of (i) Multidisciplinary Management Seminar, (ii) Innovation Management Seminar and (iii) Creative Industry Seminar.
- WP3 Pedagogical Development and Integration: Melting in a unique education program interdisciplinary areas of design, engineering and business, involving both academia and industry institutions. Involving students, teachers and business partners will to carry out innovative projects. Training activities will be also developed within the HEIs in the Israel as well as in EU facilities.
- WP4 Mobility Program (Students and Teachers): participation of students and teaching staff from Israel in mobility grants at European institutions
- WP5 Foundation Of Innovation Hubs: Initialisation of the steps to create innovation hubs in Israeli HEIs to promote research and innovation in the areas of design, engineering and business.
- WP6 Quality Control and Tools: Assessment and supervision of the quality and performance levels of IDEA Project. The information is gathered through surveys and annual reports.
- WP7 Dissemination: The work developed, as well as, its goals and workshops are spread to students, faculty and industry in order to increase the awareness of IDEA project. The media used are: Dissemination plans, deliverables, website, newsletters and social media
- WP8 Sustainability and Exploitation: A sustainability plan is applied to promote the adoption of the project results by the IDEA partners beyond the scope of the project's lifetime
- WP9 Management and Sustainability: management issues of the Project as regards the administration, financial resources, governing broad and coordination agreements.

### 3 STUDENTS MOBILITY PROGRAMME

In WP4 (Figure 2) students and faculty from Israel participate in grants at European innovation hubs, research centres or enterprise units. In the UPV case, the students went to CIGIP and IGD research centres. Two types of mobility are considered in WP4:

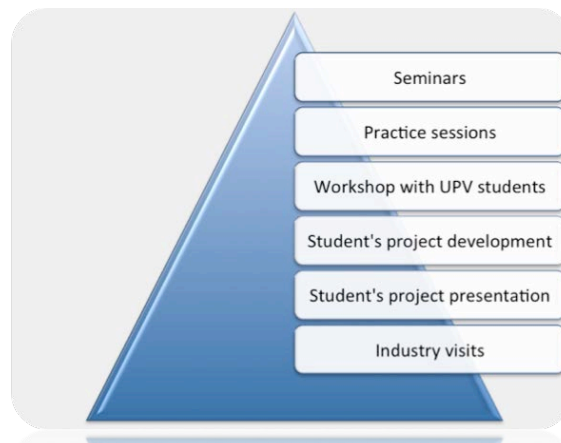
- Faculty training: 2-week-long training session (1 week at 2 different EU innovation labs) for Israeli faculty. Each Israeli HEI sent a group of 3 participants to 2 different EU facilities between the sixth month and the eighteenth month of the IDEA project. The training programme allowed them to learn and practice closely the EU industry-academy research model and practice.
- Student grants: A mobility programme for students from Israel to carry out a stay in EU HEIs.

The students of the mobility programme in UPV came from Sapir Academic College [6].



**Figure 2.** IDEA Project Event Calendar (2013 - 2015).

This paper focuses on the Students Mobility Programme (WP4) in which the Israeli students moved to the *Universitat Politècnica de València* (UPV) from the 8<sup>th</sup> September to 21<sup>st</sup> September, 2014. The activities carried out by the students are described in the paper, and classified according to figure 3.



**Figure 3.** Classification of the activities carried out in the mobility programme.

The description of all the activities will follow the next scheme (Table 1).

**Table 1.** 10 days of activity programme.

N	Day	Activity	From	To	Hours
1	8/09/2014	Introduction UPV, CIGIP and 10 days programme	10:00	11:00	1
2	8/09/2014	Introduction IGD	11:00	11:30	0,5
3	8/09/2014	Introduction student's projects	11:30	13:00	1,5
4	8/09/2014	Industry visit	16:00	18:00	2
5	9/09/2014	Practice on Trends Matrix	10:00	12:00	2
6	9/09/2014	Practice on 10 Types of Innovation	12:00	13:00	1
7	9/09/2014	Industry visit	16:00	18:00	2
8	10/09/2014	Project Planning Workshop	10:00	14:00	4
9	10/09/2014	Project Planning Workshop	16:00	18:00	2
10	11/09/2014	Project Planning Workshop	10:00	14:00	4
11	11/09/2014	Project Planning Workshop	16:00	18:00	2
12	12/09/2014	Project Planning Workshop	10:00	14:00	4
13	15/09/2014	Seminar on eco-Design	10:00	12:00	2
14	15/09/2014	Student's projects development	12:00	14:00	2
15	16/09/2014	Seminar on Internet of Things	10:00	12:00	2
16	16/09/2014	Student's projects development	12:00	13:00	1
17	16/09/2014	Industry visit	15:00	17:00	2
18	17/09/2014	Student's projects development	10:00	14:00	4
19	18/09/2014	Student's projects development	10:00	14:00	4
20	18/09/2014	APP TRADE CENTRE visit	16:00	19:00	3
21	19/09/2014	Student's projects presentations	10:00	14:00	4
					50

Hereafter a description of each activity is given:

**Activity 1. Introduction to UPV and 10 days programme**

Presentation of the hosting university (UPV), the Research Centre on Production Management and Engineering (CIGIP) and the agenda of the 10 days mobility programme.

**Activity 2. Introduction to IGD**

Presentation of the Design Research and Management (IGD).

**Activity 3. Introduction student's projects**

Presentation of the topic issue of the projects to be developed by students along the mobility programme. The project is related to the **"Analysis of Trends in Public Urban Transport"**

**Activity 4. Industry visit: Innoarea Design Consulting**

*Innoarea Design Consulting* [7] is a creative company technology based. Is a Spin Off of UPV [8]. Innoarea is particularly innovative in the way of understanding the design services offered to enterprises. Innoarea provides comprehensive consulting for new product development. It is a strategic design consultancy whose activity is focused on the detection of market opportunities for new products, design, development and marketing for client companies. In Innoarea, strategic design offers not only projects, but also looks for companies to collaborate in the exploitation of the products resulting from the projects. Innoarea delivers tangible solutions based on the use of different technologies for (i) the analysis of the social contexts of the companies or products and (ii) the level of immersion of design in the customers value chain. Tools like the Maps product, *innometro*, *Matrix trends* or *user analysis methodologies through social networks* are all examples of the methodologies applied in the development of the consulting services.

**Activity 5. Practice on Trends Matrix**

Analysis of the value chain in an industrial or service sector. Creation of a Trend Matrix of a sector. Innoarea is present on the Enterprise Europe Network with the Trend Matrix technology.

Trends Matrix [9] an ICT expertise tool for design trends analysis. Its main application is to build a customised observatory to detect opportunities for new products. The tool is based on knowledge managers' skills and it is ready to use for the toy making, furniture and lighting sectors. The company is looking for SMEs associations, research institutes or consultancy companies to implement the technology or adapt it to specific needs. SEIMED is the part from the Enterprise Europe Network [10] that offers services to SMEs from Valencia region. Its aim is to give support to SMEs to develop its potential innovative capacities through internationalization, technology transfer and access to funding. That is the strategic aim of Innoarea for the following years: develop the technology base; expand the international presence and transfer new applications for companies and sectors.

#### Trends Matrix

Tool for analysis of trends to the industrial sector and the services that enable identification of the main agents and referents each sector or country

### **Activity 6. Practice on 10 types of innovation**

Analyse the value chain of a company. Proposal of improvements from the 10 types of innovation [11].

### **Activity 7. Industry Visit: Gecileva**

GECI Española Levante, S.A. [12] was born in Valencia in 2000, mainly engaged in aeronautical parts and service support for airlines, MRO facilities and the aviation industry. Although there is a young company, they have highly qualified personnel with experience in the management of aeronautical equipment, and the support of our parent company, GECI Spanish, SA, headquartered in El Puerto de Santa María (Cádiz), with over 20 years of industry experience. In GECI Spanish Levante, S.A. incorporated a new concept in which the services and prices are conjoined to create a unique solution tailored to the requirements of each of their clients. This concept includes the ability and means to serve customers in all related materials in all disciplines and support, from maintenance and repairs the storage of the annual consumption of a product while maintaining a fixed annual price thus reducing the number of requests and Orders Offer to Purchase and the additional costs and rental routable spare parts administration "exchange" and PBH "By Power Hour".

### **Activity 8. European Project Semester. Project Planning Workshop (I)**

Workshop on Project Planning with students of the School of Design Engineering of UPV. Sapir students had a first meeting with other students of the exchange programme carried out in the School of Design Engineering of the UPV. They collaboratively worked in order to develop a common Project treating the new launch of a chocolate bar. Sapir students exchanged experiences with students of the School of Design Engineering. Four groups are formed, with 3 students, each one will develop a project as regards the same topic. The groups of work will remain throughout all the stay.

The topic selected is the production of a new chocolate bar in order to introduce this new product in different target groups: Construction workers, Kids, Energy bars for athletes. Nutritional/health foods market, Winter sport fanatics, Sun Worshippers, Professionals, take away in the office, Party goers, design a chocolate accessory for drinks at parties, People who don't like chocolate, and Pensioners.

The aim of developing the student's Project development activity is to develop a good understanding of project working from a practical and a realistic background. All teamwork is based on positive human relationships during daily cooperation between team members. A summary of the skill acquired:

1. Contents
2. Introduction and Definition of a Project
3. Basic Elements of a Project
4. Organising a Project
5. Planning a Project
6. Resource Analysis
7. Tools
8. Monitoring and Controlling a Project
9. Internal Co-operation within a Project Team

### **Activity 9. European Project Semester. Project Planning Workshop (II)**

Microsoft Project Tutorial: Microsoft Project is a very useful piece of software to assist in the planning, execution and progress monitoring of a project. As time is too limited to allow an in-depth tutorial for using the software, the following notes are intended to provide a basic introduction. In addition, MS Project offers a more detailed tutorial, through the 'Help' drop-down menu.

### **Activity 10. European Project Semester Student's projects development (III)**

#### **Project Title: Design of a new chocolate bar**

#### **Introduction**

There are many different types of chocolate products within the market place. Some are available globally and, as a result, well known and easily recognisable. Others are equally well-known, but in a more constrained geographical area.

So, what influences the design of a new confectionary product? What is the target market? What would be the make-up of the product and the marketing strategy?

There are many variables influencing in confectionary products– the products may be pure chocolate, but could be a mix of dark and milk; they may contain candy, fruit, nuts, biscuit, cereal etc. The percentage of chocolate varies – what are these percentages and why are there so many different options? How does this affect the price? How do the above factors influence manufacturing?

All of these issues are relevant to develop the project.

#### **Project Brief**

The task is lead to design a new chocolate bar for a specific target group, which will be selected at random from a number of options. Students need to carry out some market research, some analysis of confectionary – what is the source of the chocolate and how is it transformed into the product? How does the manufacturing process work – not just the actual product, but also the additional elements added and, of course, the packaging. What about recycling?

### **Activity 11. European Project Semester. Student's projects development (IV)**

A set of exercises are developed providing an opportunity for the project groups to develop project management skills and team working. It also help each group member begin to understand the individual skills of each member of their team and how these interact.

Exercise 1: Modelling 'The Project'

Exercise 2: Structuring 'The Project'

Exercise 3: Work Breakdown Structure / Responsibility Matrix

Exercise 4: Gantt Chart

### **Activity 12. European Project Semester. Groups Presentation – Project Review (V)**

The students task is to prepare a short presentation of their projects so as to inform the other groups about your project. Students are required to use the information they have developed from all of the earlier exercises.

Students should give a clear indication of what your project is about and include your Aim, the Basic Elements, Project Specification, team responsibilities and the proposed Plan (Gantt Chart).

The duration of the presentation should be no longer than 10 minutes and should be given by two members of the group.

Following the presentation, there will be an opportunity for questions to be asked by the audience – this means the other groups attending the presentation (Figure 4).

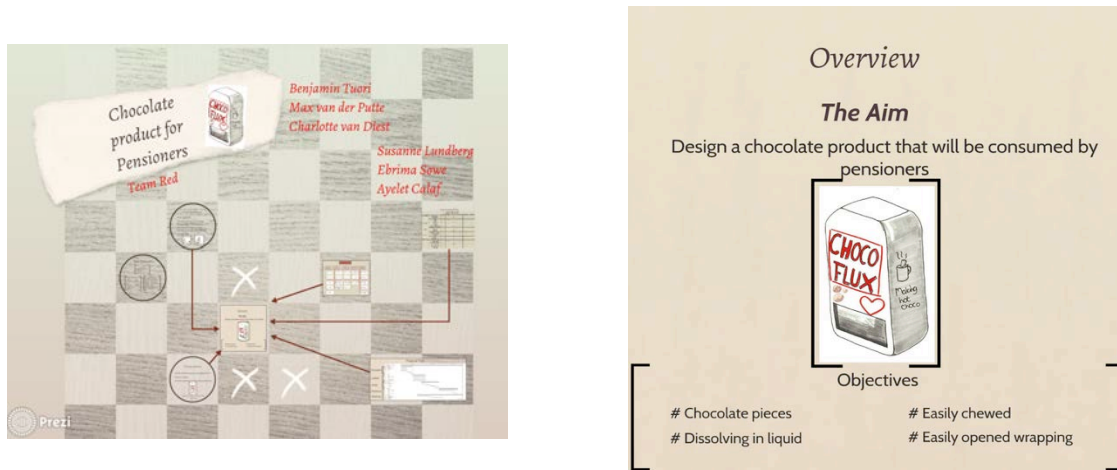


Figure 4. Screenshots of one of the presentations.

### **Activity 13. Seminar on Eco-Design**

Concepts treated: Green marketing and Eco design

Planet Design Project [13] was presented.

CIGIP research centre was involved in the performance of the Planet Design Project, a European Project developed during three years (2009 - 2012).

Support in adapting to the new regulations dictated by environmental sustainability and in using them as an opportunity for a sustainable development and growth, for anticipating the needs of the market and for activating eco-innovation. Other Project aims were related with helping companies on the identification of their potential for a sustainable innovation. Such as the adoption of EMS (Environment Management System) requires companies to self-assess their environmental impact and problems, as a starting point, and guides them towards continual improvement actions in order to identify eco-innovation opportunities and actions. A set of roadmaps were introduced as regards strategies towards eco-innovation.

Examples were also introduced for the students' better understanding.

Finally a practice review was carried out in order to settle the concepts viewed in the seminar:

- Compute the carbon footprint of each student.
- Compute the carbon footprint of Sapir College.
- Educational videos related with the treated topic

### **Activity 14. Students Project Development: TRENDS IN URBAN PUBLIC TRANSPORT**

All the activities developed are supervised by the advisors.

The concepts viewed in the seminar will be applied for their projects development such as carbon footprint or Eco labels.

Application of Eco-Principles, Eco-Trends in Urban Public Transport

### **Activity 15. Seminar on Internet of Things**

Seminar on IoT applications at product marketing.

The concept of Internet of Things (IoT) has been treated with special emphasis in product marketing and how could be applied. IoT brings together people, processes, data and things.

IoT is seen as the latest technology for supporting business.

IoT it is considered a new topic research in the European Union H2020.

The concept of augmented reality is also an emerging issue in IoT

Learning activities, videos and reinforcement exercises are developed in the IoT Seminar

### **Activity 16. Students Project Development**

All the activities developed are supervised by the advisors. The concepts viewed in the IoT seminar will be applied for their projects development.

The influence of new concept IoT when managing the trends in public urban transport.

### **Activity 17. Industry visit: Emuca**

The Emuca Group [14] designs, manufactures and sells a wide range of products for the furniture, carpentry, hardware and DIY sectors.

With over 30 years' experience, Emuca Group has learnt that staying close to the market is essential to understanding the customers and satisfying their needs. Emuca Group has several affiliated companies throughout Europe.

Having headquarters in Valencia (Spain), Padua (Italy) and Basildon (UK) allows us to remain in direct contact with the latest trends in the furniture sector and our R+D+i department is dedicated to reflecting these trends in our products.

Emuca Group export to over 50 countries and have an extensive network of qualified sales representatives who are all highly conscious of the particular demands of the different markets.

To ensure that their operations are as efficient as possible we have a factory in Spain that offers complete solutions in aluminium.

At Emuca are aware of how important it is to strike a balance between function, quality and price. Emuca offer competitive products that adapt to meet both market trends and sector demands.

The international presence of the Emuca Group and the highly valued opinions of their customers are also essential to meeting the changing demands of the furniture sector, which arise from our constantly changing lifestyles.

### **Activity 18. Students Projects development (I)**

### **Activity 19. Students Projects development (II)**

Both days Sapir students were developing the project: "Analyse Trends in Public Urban Transport". The next structure was followed (Figure 5):



**Figure 5.** Projects Layout: Structure.



## **Activity 20. Sciences Museum Visit: App Trade Centre (ATC)**

**App Trade Centre** [15] is the first business centre in the ecosystem of the App in Spain. A single event can bring together in one place all actors Apps ecosystem.

Developers, publishers, marketing agencies Mobile, companies engaged in the manufacture of new mobile devices, marketers, senior corporate executives, IT professionals and trade press are part of the universe App Trade Centre.

After the success of 2013, ATC will hold its second edition on 18 and 19 September in Valencia under the title "**From OFF to ON in my**" in order to introduce in the digital environment to companies that do not have their own presence in stage applications.

More than 600 professionals gathered at the first edition gave corroborating the need to have a unifying event that would bring together the different actors of the same and provide a platform to promote their development and services sector.

## **Activity 21. Students Projects Development**

The students have to present the work developed in the project. This activity allowed them to make their presentations in power point and prepare it.

The students prepare a short presentation of their project so as to present the results they have obtained during the Project development and what they were doing. Students are required to use the information developed from all of the earlier activities and seminars.

A piece of advice is given to the students in order to prepare good presentations, such as:

Aspects to consider during the presentation:

- Structure
- Content: appropriate content to explain the work developed in the project
- Clarity of ideas and compression
- Effectiveness
- Relevant aspects of the developed project

Students give a clear indication of what the project is about and include the Aim, the Basic Elements, Project Specification, team responsibilities, the proposed Plan (Gantt Chart), the Trends Matrix, Conclusions and Future aims. Other

The duration of the presentation should be no longer than 20 minutes and should be given by all the members of the group.

Following the presentation, there will be an opportunity for questions to be asked.

## **4 CONCLUSIONS**

This paper has summarised the work developed in the mobility programme carried out in the WP4 of the IDEA Tempus Project. In WP4 students and faculty from Israel will participate in extended internships at European innovation hubs, research centres or enterprise units at selected EU sites so that they could learn first-hand how such facilities can be developed and implemented. The own experience in UPV is described in detail. Mobility programmes between the EU partners to Israel are considered essential for the success of any technology transfer programme. The improvement on skills in innovation programmes for education in both faculty and students is the main benefit obtained from the stays carried out in EU countries.

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