



MONDRAGON
UNIBERTSITATEA

GOI ESKOLA
POLITEKNIKOA

ESCUELA
POLITÉCNICA
SUPERIOR

14/15 REPORT





14/15 REPORT

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The image shows the exterior of a modern building with a large sign. The sign is white with black text and is mounted on a light-colored wall. The text on the sign reads "MONDRAGON GOI ESKOLA POLITEKNIKOA" in large, bold, sans-serif capital letters. Below this, in smaller capital letters, is "SE MARIA ARIZMENDIARRIETA". The building has a mix of materials, including light-colored panels, brickwork, and glass. There are several windows with white frames. In the foreground, there are bare tree branches and a blue metal gate. A silver car is partially visible behind the gate. The sky is overcast.

MONDRAGON
GOI ESKOLA
POLITEKNIKOA
SE MARIA ARIZMENDIARRIETA

A BRIEF HISTORY

The Mondragón Higher Polytechnic School was created in 1943 on the initiative of Father José María Arizmendiarieta, Founder of the Mondragón Cooperative Experience. It has not stopped growing since the outset, also giving rise to the creation of many innovative business experiences.

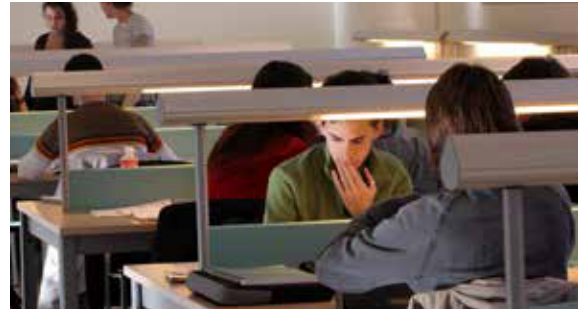
A major landmark in the history of the School was the founding by five of its technical engineers in 1956 of the Mondragón cooperative movement's first industrial cooperative society: ULGOR, S. Coop.

Another milestone was the creation of the industrial cooperative society ALECOP in 1966, which enabled students to combine their studies with work at a company.

Later on, in 1972, internationalisation took place when the first university exchange programmes were organised with centres abroad. The School has also been actively involved in numerous international Training and Research & Development projects since 1986.

1974 marked the creation of the IKERLAN Research Centre, which is now one of Spain's most cutting-edge technology centres, employing some 200 researchers.

In 1983, the Gizabidea Private Educational Foundation was recognised, posthumous work of Fr. José María Arizmendiarieta, and it took over the running of the School's buildings.



The School has also played an active role in other socio-corporate initiatives over the last three decades, such as DIARA, a pioneering Industrial Design company founded in 1985, and various education centres. More recently, in 1996, the company CEI SAIOLAN was created as a business incubator for new enterprises in advanced sectors, although this activity had already been delivering benefits since 1984.

In 1995, the Higher Polytechnic School became the first university centre in Spain and one of the first in Europe to obtain the ISO ER353/1/95 Quality Certificate.

MONDRAGÓN UNIBERTSITATEA (Mondragon University) was created in 1997, together with two more university centres in the Alto Deba area: ETEO S. Coop. in Oñati and Irakasle Eskola S. Coop. in Eskoriatza, now respectively known as ENPRESAGINTZA and HUHEZI.

In 2002, in collaboration with the Goierri Foundation, the HPS campus was started in Ordizia.

The Silver Q Award was received in 2003, with a score of over 400 points in an external evaluation conducted by EUSKALIT.

In 2008, the School was the first Basque University to adapt its engineering studies to the new European Higher Education Area.

September 2010 saw the official opening of the Centre for Technological Research and Innovation in Electronics and Embedded Systems, located at the Garaia Innovation Park and which combines research and training in the fields of electronics, computer science and telecommunications.

In September 2013, the HPS, in alliance with Orona Ideo, opened the new campus in Donostialdea in the Orona Foundation building.

In July 2014, the AUDIT Certification was awarded after the assessment by UNIBASQ and ANECA.

In 2014-2015, we celebrated the 100th anniversary of the birth of Jose Maria Arizmendiarieta.

COMPOSITION OF THE HIGHER POLYTECHNIC SCHOOL

The legal name of Mondragón University's Higher Polytechnic School (HPS) is Mondragon Goi Eskola Politeknikoa (MGEP). It is a mixed cooperative with three types of members in equal numbers:



- Working partners.
- User partners (Students).
- Collaborating partners (Companies and Government bodies).

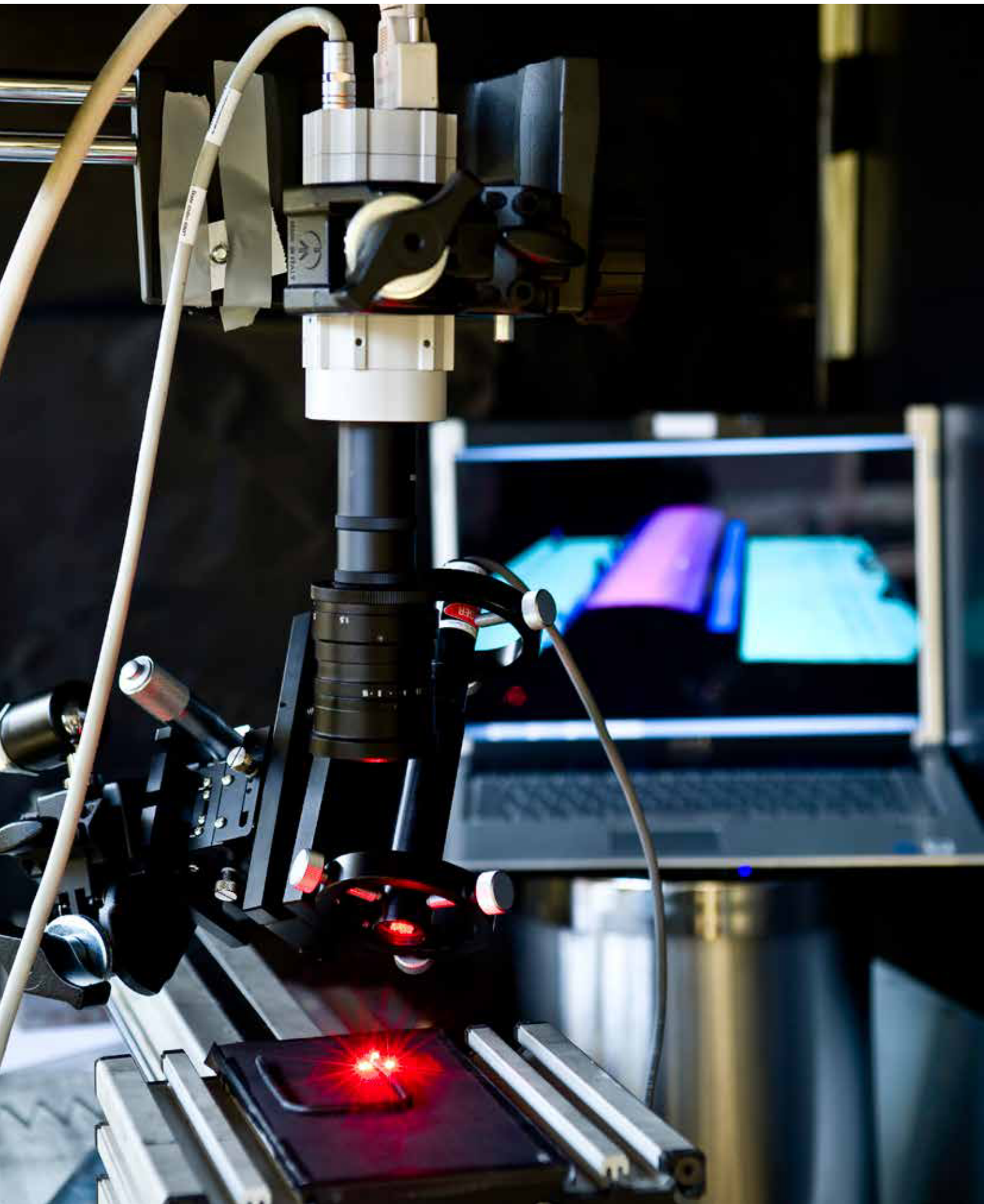
The Assembly, which is its ultimate decision-making body, and the Governing Board, which establishes its lines of action, are both made up of equal numbers of these three types of Partners. This structure enables the students and companies to become directly involved in running the centre.

Bearing in mind that the main mission of the HPS is to train students for a professional career in an industrial environment, the legal formula of the mixed cooperative, which has been integrated into the business world and, in our case, mainly into the cooperatives, has been an essential factor in its constant evolution and adaptation to external demand.

Equally, the real opportunity for our students to take sandwich courses via the ALECOP (work-study) model is a key added value throughout our development. As is the performance of the degree and master's final projects/thesis in companies or in the HPS itself under contract R&LD projects with companies.

The employment status of the HPS' teaching staff is equivalent to that of professionals belonging to an industrial cooperative. Specifically, aspects such as the working calendar, timetables, wages and the staff promotion system are all equal.





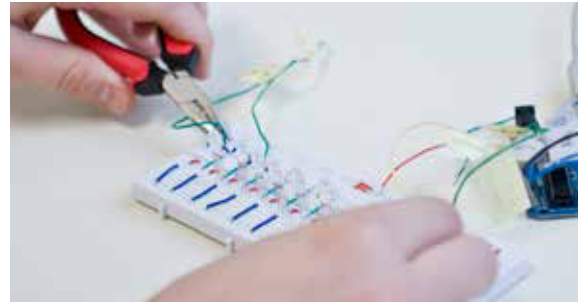
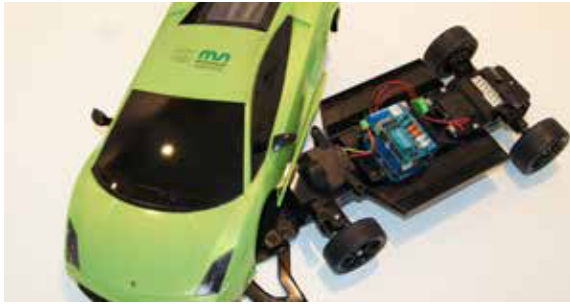
ANNUAL REPORT

The annual report on the academic year 2014-2015 aims to inform our partners and the general public about our School's project, that of the Higher Polytechnic School of MONDRAGON UNIBERTSITATEA. It gathers the most significant data which reflect the evolution of the HPS and values in a qualitative manner the most notable circumstances which have arisen during this period of time.

The activities or businesses of HPS are constantly geared towards its mission statement: to transform society through comprehensive education, to generate and socialise knowledge in the scientific-technological field and to improve customer satisfaction, i.e., that of the general public and, more specifically, that of students, companies and institutions.

With regard to the formal training activities (the clients of which are Degree, Masters and Doctorate Engineering students and those of Higher Technical Certification Courses), the 2014-2015 academic year has been marked by the consolidation of the renewal of the academic offering initiated during the previous year. We have therefore confirmed the three new degrees in Biomedical Engineering, Industrial Environmental Technologies and Energy, the last two being offered in the new Orona-Ideo campus, and two years of the Higher Technical Certification course on Industrial Mechatronics in partial format to respond to the re-qualification needs of professionals, especially partners of cooperatives undergoing relocation processes.

With regard to the non-formal (or continuous) training and research and transfer activities, the



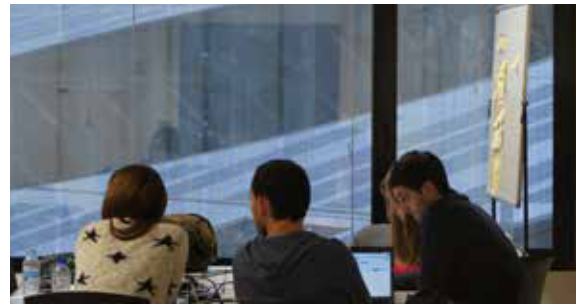
main clients of which are companies and institutions, the academic year 2014-2015 has shown a clear change in trend with respect to the recession which began in 2008. Without attempting to make triumphalist assessments, and always with caution, we can see a clear recovery of both the institutions and the companies in their commitment to research, the generation of knowledge, their focus toward the creation of value of products, processes and services, and training of their technicians and professionals. This change in trend leads to better conditions for the HPS to develop its mission statement through the Research, Transfer and Continuous Training activities and thereby help improve the competitive position of the companies in our environment.

In quantitative terms, HPS has grown 0.5% compared to the previous academic year. Our work has been acknowledged in the three leading surveys published during the 2014-2015 academic year. MONDRAGON UNIBERTSITATEA as a whole has been recognised as the best Spanish university in applied research in the last three editions of the survey performed each year by the CRUE (Board of Governors of Spanish Universities). Equally, according to the ISSUE (Synthetic Indicators of the Spanish University system) Ranking prepared by the Valencia Institute of Economic Research in collaboration with the BBVA

Foundation, it equally excels in both Teaching and Technological Development and Innovation (third position in both at state level). Lastly, according to the U-Multirank survey, piloted by the European Commission and which classifies the European universities, MONDRAGON UNIBERTSITATEA stands out from other Spanish universities in the section of most cited scientific publications and in the transfer of knowledge and continuous training activities.

In these times of reflection, review and redefinition of the concept of cooperativism, and coinciding with the 100th anniversary of the birth of Jose Maria Arizmendiarieta, HPS ratifies its firm commitment to the principles and values it promotes and defends and which are still perfectly valid. The cooperative model allows the combination of personal development in a fairer and more balanced society with a demanding business approach which pursues maximum efficiency in its activities, which, in the case of HPS, implies commitment to our Mission to provide training and education for youths and adults and support and assistance to our companies so they can improve their competitive level in a continuous and sustainable manner.

We would also like to make special mention of the support from the Basque Government during



2014-2015, despite the difficulties, especially via the University Plan managed by the Department of Linguistic Policy Education and Culture and the support from those of Economic Development and Employment Competitiveness and Social Policies. The support of the Innovation, Rural Development and Tourism department from the District Council of Guipuzkoa has also been significant. And, lastly, that of the Ministry of Economy and Competitiveness of the Central Government. The competitive tenders promoted by all these institutions make it possible to develop and transfer knowledge and technologies which allow our companies to compete at a global level, to contribute to the renewal of knowledge and abilities of technical professionals via learning throughout their entire lifetime, and, lastly, to improve the training provided to the student body of technical and engineering studies to prepare them and give them the necessary abilities to allow them to become the engine for change in the companies which they join when they complete their studies, and to guide them towards activities with increasing added value.

An important milestone during the 2014-2015 academic year was the adaptation of the teaching spaces, department and laboratories required to be able to transfer all the Electronics, IT and

Telecommunications activities to building 11 of the Garaia Innovation Park, consolidating it as Hezigune. This academic year has also seen work in the Iturripe campus in order to adapt the spaces to the growing demand of the degree in Biomedical Engineering and the conditions this speciality requires for research purposes. All of this has implied a significant investment of 2.3 million euros which we have financed with our own funds.

Our challenge of maintaining a university model committed to local business and to training its professionals is reflected in our Continuing Training programme. In 2014-2015, nearly 300 courses were attended by over 3,000 professionals, and more and more companies are asking us to provide tailored training, including a professional development plan and coaching in the use of methods and tools.

We have maintained our strategic commitment to the industrial development of the Basque Country by aligning our abilities and strategies with the needs of the local companies in order to help improve their competitiveness. The main operating lever is through the development of our Research and Collaborative Transfer model which is materialised in long term agreements with large, medium and small enterprises, whether they are driving companies



or not, but which base their growth strategy on a clear commitment to technological research and development. HPS currently has Research and Transfer Programmes established with Orona, ITP, Fagor Arrasate, Ingeteam, the Components, Automotive and Engineering divisions of Corporación Mondragon, CAF, Matrici, Ampo, MSI, Ormazabal, Batz, Ederlan, Ekide, Ulma Embedded, Goizper and Shuton, among others. The fact that 54% of this research during the 2014-2015 academic year was financed by companies is proof of the value added to the companies by the Higher Polytechnic School.

Against popular belief, an approach geared towards business interests is compatible with scientific excellence. 14 theses were produced during 2014-2015 and 112 theses are currently being prepared, 65% of which are entirely funded by companies. With regard to scientific production, we have published 38 articles during 2014-2015 in publications included in the Journal Citation Report (JCR), 53% of which were publications in the first quartile and another 24%, publications in the second quartile, which gives an idea of their quality. The success in European competitions has been especially significant, with a total of 11 new research projects approved and financed throughout the academic year 2014-2015 within the framework of the Horizon2020 Programme.

Regarding the financial-economic situation, the turnover for 2014-2015 amounted to 27,708 thousand euros, representing 0.5% growth with regard to the previous financial year.

Legal surplus amounted to €243,000, after provision for the COFIP (Mandatory Contribution for Purposes of Public Interest) and payment of interest on the contributions.

Ordinary investment made during the year amounted to €1,289,000, 55% higher than the previous year's figure and financed mainly by subsidies from the MONDRAGON Corporation's Inter-Cooperative Education and Promotion Fund (FEPI) and the Basque Government.

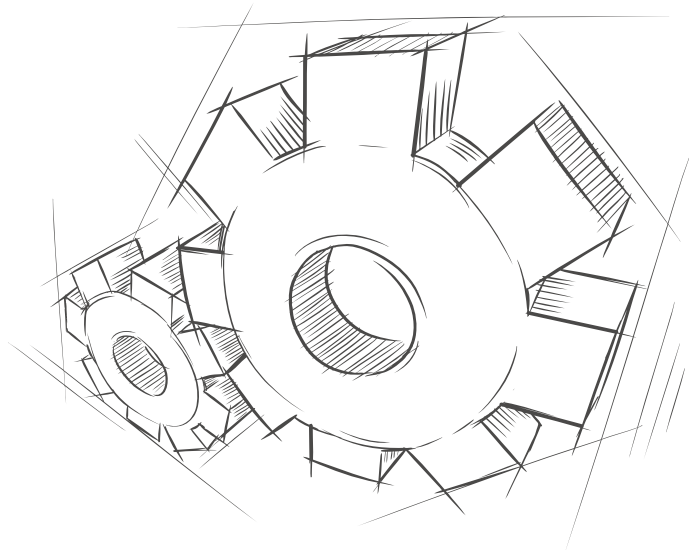
The exceptional investments made in the expansion and equipment of building 11 in Garaia amounted to €2,351,000.

With regard to the Balance Sheet, as at 31-08-2015 it showed a figure of €59,260,000 implying a 3% growth over the preceding year. The solvency and independence ratios are also worth highlighting.

None of these activities would have been possible without the participation and commitment of



the 435 people who have led the Mondragón Higher Polytechnic School project with enthusiasm, respect and responsibility. This is an educational project geared to the development of a free society, committed to its future.





ACADEMIC REPORT

POLYTECHNIC INSTITUTE

DEVELOPMENT OF THE ACADEMIC ACTIVITY

Professional Training continues to play a key role in the academic activity of the MGEP. Six Upper-Level Vocational Training Courses have been taught, relating to the four professional fields most directly connected with the local industrial sector: Mechanical Manufacturing, Electricity and Electronics, IT and Communication and Installation and Maintenance.

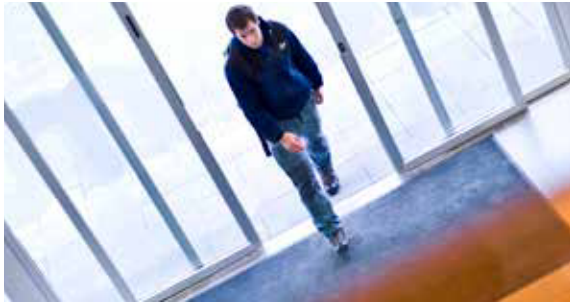
- Advanced Technician in Industrial Mechatronics.
- Advanced Technician in Mechanical Manufacturing Design.
- Advanced Technician in Mechanical Manufacturing Production Programming.
- Advanced Technician in Network Computer Systems Administration.
- Advanced Technician in Industrial Robotics and Automation.
- Advanced Technician in Electrotechnical and Automated Systems.

225 students have been trained in the 14 Upper-Level Vocational Training groups. During this academic year,

all the qualifications offered are courses contemplated in the new Organic Education Law (LOE), having removed the LOGSE (previous educational law) courses entirely.

In collaboration with the Mondragon group and the Professional Training and Permanent Learning Vice Council of the Basque government, we have begun to offer two courses (one in the morning and one in the afternoon) for the Industrial Mechatronics qualification in partial format in order to meet the educational requirements of the Fagor Electrodomésticos partners in particular and the Mondragon group in general. 36 students have enrolled in this first year.

A fundamental element of the courses is Workplace Training (WT), which enables both students and work experience tutors to work directly with companies. A total of 87 students undertook Workplace Training at 47 different companies. Also, in collaboration with HETEL (the Association of Vocational Training Centres created by Social Initiative), 5 students trained at companies abroad as part of the ERASMUS+ programme in various countries such as Czech Republic and Poland.



In addition, our students have entered three competitions:

- FTC robotics competition organised by FIRST: a group of students and teachers from different branches have taken part in the European competition held in Eindhoven (Holland), where the help of Danobat Group, Mondragón Assembly, Fagor Automation and Grupo MONDRAGON companies was vital.
- Competición SCE - Industry Automation 2015, organised by Siemens, reaching the finals.
- 4th Competition of Energy Efficiency in Professional Training, organised by Schneider Electric.

Additionally, 5 students obtained their degrees this year through the work-study courses (DUAL sandwich courses run by the Basque Government) with a further 14 embarking on the programme upon completing their first year of study.

The general level of satisfaction of our students is high, both with the academic studies carried out at MGEP, particularly the practical sessions and group projects, and the Workplace Training, and these are key indicators for our activity

INNOVATION IN THE TEACHING-LEARNING PROCESS

During the 2014-2015 academic year, we have continued to redesign the learning processes based on the achievement of learning results. This knowledge will be the professional competences which the students must achieve in order to participate in the work environments. In this respect, two of our teachers have received training in active learning methodologies in relation to the ETHAZI project, driven by Tknika (Innovation Centre for Professional Training).

This redesigning and adaptation of the objectives for each qualification have set the foundations in the development of the educational model, progressing in the active methodologies and taking continuous assessment a step further. The introduction of practice-based learning, i.e., know-how, has meant the transformation of the elements of the learning-teaching process. Practical learning and learning by doing puts the focus on the student. Therefore, the teacher's and student's roles change in the new model.

The student adopts the role of technician who performs projects in which he/she experiments and builds situations that will arise in the near future in



the labour market. For this purpose, the student must suggest what must be done and how to do it to resolve a problem or respond to a need.

TECHNOLOGY INNOVATION AND INVESTMENTS

The major technology evolution, particularly in technology connected with university-level courses in Vocational Schools, has led us to an important investment effort in order to renew and adapt our laboratories and facilities. This was financed by Inter-Cooperative Education and Promotion Fund (FEPI) resources received from MONDRAGON and equipment subsidies from the Basque Government's Education Department, and, more specifically, the Vocational Training Directorate. The investment was mainly made in the fields of Mechanics, Electronics, IT and Manufacturing.

To make efficient use of these resources, technology projects such as prototypes, scale models and manuals are also being developed, to aid both students and teaching staff in their academic tasks with workshop and laboratory practical sessions and innovation projects. These innovation projects for this year are:

- Micromanufacturing, in collaboration with HETEL as a BETEKU project.
- Development of electric demo-cars and electrical innovation in new alternative propulsion engines in the automotive field.
- Inverse engineering technologies, design, manufacturing and verification of unitary industrial parts and customised sanitary products.
- Design of tools for handling ultraresistant steel sheets for the automotive and aviation industry.

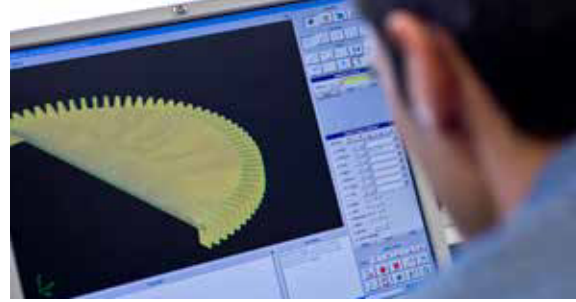
The last three projects led by Tknika and in collaboration with other Professional Training centres.

EMPRENDIZAJE

This academic year we continued our activity with the entrepreneurship working party, geared to motivating the entrepreneurial culture. In addition, our participation in TKNIKA's Urratsbat scheme enabled us to enhance this area through exchanges of experiences.

The following activities were developed:

- Entrepreneurship awareness-raising lectures.
- Entrepreneur's Day, with activities to motivate entrepreneurship and guest speakers.



-
- Procurement of complementary training for the students' professional development.
 - Finding employment opportunities in today's complex market.
 - Empowerment for creation and launch of the students' own business ideas.

In the 2014-2015 academic year, all the Upper-Level Vocational Training Courses have taken part in the "IKASEMPRESA" project, an educational tool based on practical experience (development of a business project) and on interaction with external agents. The project includes an "ENTREPRENEUR FAIR" which was held in February and involved all the centres participating in the scheme. The aims of this project were to:

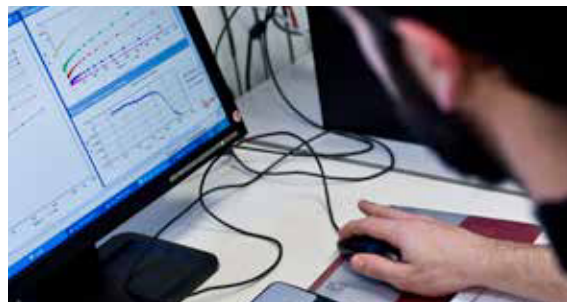
- Foster development of entrepreneurial skills.
- Give students the chance of finding out about local institutions, entities and companies and contacting them.
- Help clarify misconceptions regarding entrepreneurship.

Furthermore, a group made up of three students, one female and two male, in the second year of Administration of Network Computer Systems have developed a viability study of their own business project in the IT field within Tknika's Urratsbat programme.

RELATIONSHIPS

As an associated centre, in addition to our working relationship with the Basque Government's Vice Ministry for Vocational Training and Lifelong Learning, we also participate in different schemes set up by the Guipuzcoa Regional Government and Lanbide.

We liaise with educational centres and associations in our region and in other areas. This includes membership of HETEL, the Association of Vocational Training Centres created by Social Initiative, which is present in numerous regions of the Basque Country.



ENGINEERING

In the 2014-2015 academic year, we offered 9 Degree courses and 5 Master's Degrees and one Doctorate degree adapted to the European Higher Education Area (EHEA). These were as follows:

- Degree in Mechanical Engineering
- Degree in Engineering in Industrial Design and Product Development
- Degree in Engineering in Industrial Organisation
- Degree in Engineering in Industrial Electronics
- Degree in Computer Engineering
- Degree in Engineering in Telecommunications Systems
- Degree in Energy Engineering
- Degree in Engineering in Eco-technology in Industrial Processes
- Degree in Biomedical Engineering

-
- Master's Degree in Business Innovation and Project Management
 - Master's Degree in Strategic Product Design and Associated Services
 - Master's Degree in Industrial Engineering
 - Master's Degree in Energy and Power Electronics
 - Master's Degree in Embedded Systems

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- PhD in Mechanical Engineering and Electric Power.
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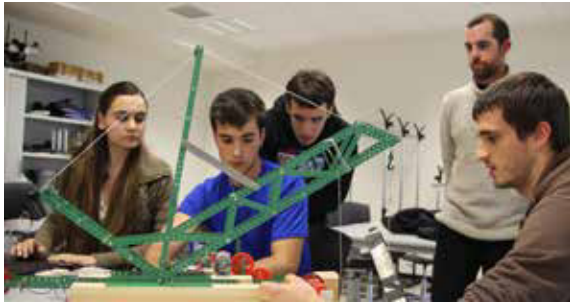
In collaboration with ANECA (the Spanish Quality Assessment and Accreditation Agency) and UNIBASQ (the Basque University System's Quality Assessment and Accreditation Agency), favourable reports have been issued on the University Masters Degree in Business Innovation and Project Management in the ACREDITA programme.

ACADEMIC ACTIVITY

All the academic activities planned for 2014-2015 were carried out in full compliance with the Management Plan.

In our effort to educate competent young adults, 1696 students have developed their academic activity in Engineering in the Higher Polytechnic School.

From a quality viewpoint, the good academic results obtained in general on both the degree and master's courses are noteworthy, as is the students' satisfaction with PBL methodology and project development. These active methods enable the students to develop key professional skills through individual and team-based learning.



EDUCATIONAL MODEL

Our School is characterised by providing practical, business-oriented training within an increasingly international framework. To advance in this challenge, we continue to develop and implement our own distinctive educational model, which has the following cornerstones:

- Intensive use of active methods in the teaching/ learning process.
- A model based on developing and acquiring skills and learning outcomes, rather than a subject-based model.
- Continuous overall assessment of students as a key tool for skills evaluation.
- Work-study alternation with in-company work experience.
- Studies and end-of-degree projects abroad.
- Teaching in three languages.
- A change in role of the teaching staff and students.

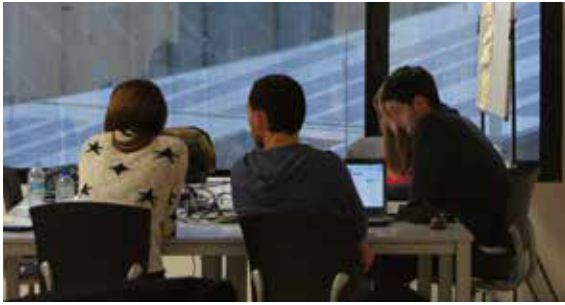
LEARNING METHODOLOGIES

The EHEA wishes students' learning to focus on acquiring skills (technical and cross-cutting), rather than on the acquisition of knowledge.

This new paradigm requires a profound change in the planning of the teaching and learning process, which now focuses on the skills to be acquired by the students, while the subject matter is a vehicle for developing and acquiring these skills.

For students to discover the usefulness of theoretical principles and to develop technical skills, we use the following teaching methods for all the subjects on our courses:

- Theory classes and lectures in the classroom.
- Classroom exercises. Problem-solving individually or in small teams (cooperative learning).
- Practical sessions in the computer room. Scheduled practical activities using a software application as a working tool.
- Practical work in laboratories. When necessary, use of equipment or machinery for testing, measuring, etc.
- Case work and/or studies. Students draw up a report and present it in class.



- Shared projects called PBL projects. One project is carried out each semester, concentrating on knowledge development and the practical application of technical and across-the-board skills.
- POPBL (Problem Oriented Project Based Learning) in Degree courses. Students are posed with a problem, which they must solve through a project.
- Retaking: A second chance to pass any activities the students may have failed is scheduled within the actual semester, eliminating the September retakes.
- Global assessment: Assessment based on the student's general performance and skills acquisition throughout the semester or year, based on a joint assessment by the teaching staff.

SKILLS DEVELOPMENT AND ASSESSMENT

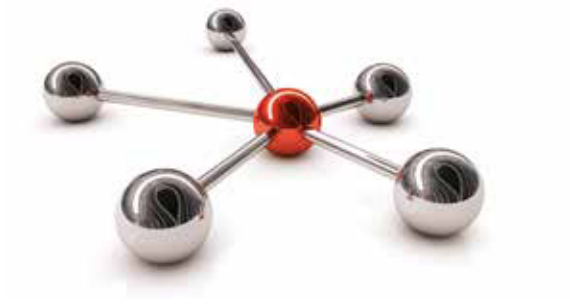
Focusing learning on acquiring skills has required the evaluation system to necessarily adapt, contemplating:

- Continual assessment: Written/oral exams, tests, assignments, projects, etc. are carried out and assessed throughout the semester, taking into account all the teaching activities that have taken place during this time, as opposed to a single assessment milestone such as an end-of-semester exam.
- Feedback: This is a key component of the learning process. The students receive assessment and individual guidance from their teachers throughout the semester at different times.

MULTILINGUALISM

Technical English is included during the first years as a subject of study; verbal and written communication in English is included as a cross curricular subject in both the writing of the technical report in the presentation and when arguing the thesis; and technical subjects taught in English are also offered throughout the different years of the degree.

This year, a total of 10.83% of credits have been offered taught completely in English at degree level, a very similar percentage to that of the previous year, and 30.17% at masters degree level, representing a strong increase with regard to the previous academic year. The academic results achieved have been satisfactory in all the cases.



STUDY-WORK ALTERNATION

A large number of students at the School combine their studies with work placements, either working in the actual School facilities as assistants in the research departments and laboratories or at other cooperatives through Alecop S.Coop.

A total of 240 engineering students combined work and study in the 2014-2015 academic year.

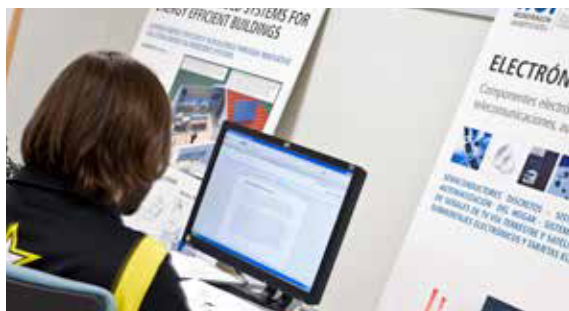
END-OF-DEGREE PROJECTS

The main aim in the end-of-course project area was to obtain quality applications from companies that were suited to the students' professional profile, with well-defined objectives, an adequate dimension according to the length of the projects and with the highest possible technology level, meeting their needs.

Significant data include the fact that a total of 376 students completed their end-of-course projects in the 2014-2015 academic year. 41 End-of-Degree and End-of-Masters Projects have been developed, mainly in Europe but also in countries outside the EU, such as Ethiopia, Brazil and Mexico, through the ERASMUS+ mobility programme, Bilateral mobility agreements or Company-university agreements.

DOCTORATE

In the 2014-2015 academic year, the School also offered numerous post-graduate courses. 112 doctoral students were registered and 14 theses were read, 5 of them obtaining the European Doctorate Mention.



The doctoral theses read during the academic year were as follows:

Engineering Doctorate Programme

- > AIZPURU LARRAÑAGA, IOSU
Energy efficiency improvement of Li-ion battery packs via balancing techniques.
- > AIZPURUA UNANUE, JOSE IGNACIO
Análisis de la influencia del fluido y de las condiciones de movimiento en la respuesta de los amortiguadores magnetorreológicos.
- > KORTABARRIA LEZETA, AITOR
Mekanizatzean sorturiko hondar tentsioen eraginaren azterketa, elementu finituen modeloen bidez.
- > LARRAÑAGA SERNA, MIREN
Determinación de las propiedades de transporte en mezclas multicomponentes.
- > LASA ERLE, GANIX
Eyeface: Nueva herramienta de evaluación de ideas conceptuales para productos y servicios basados en la experiencia de usuarioptual.
- > LOPEZ JAUREGUI, ARKAITZ
Predicción de vida a fatiga de uniones soldadas considerando el valor de las tensiones residuales.
- > MADARIAGA ZABALA, AITOR
Surface Integrity and Isothermal Low Cycle Fatigue of turned Inconel 718 workpieces.
- > MARKUERKIAGA ARRITOLA, LEIRE
An empirical-institutional analysis of factors affecting the Entrepreneurial University.
- > MAZUELA LARRAÑAGA, MIKEL
Análisis y desarrollo de una novedosa topología de convertidor multinivel para aplicaciones de media tensión y alta potencia.
- > MILICUA URCELAY, ARITZ
Estrategias de control de un compensador paralelo de reactiva en redes con tensiones desequilibradas.
- > MURGUZUR IBARGUREN, AITOR
Dynamic Variability Support in Context-aware Workflow-based Systems.
- > SAN ANDRES SANZ, UNAI
Thermal Optimization of Permanent Magnet Synchronous Machines.
- > VERTIZ NAVARRO, GORKA
Gestión térmica de sistemas de almacenamiento de energía basados en baterías Litio-ion.
- > ZABALA RODRIGUEZ, HARITZ
Influencia de la velocidad de impacto en la delaminación generada por impactos transversales de baja velocidad en tejidos carbono-epoxi. Dependencia del comportamiento interlaminar del composite a la velocidad de propagación de grieta.



INTERNATIONAL RELATIONS

During the 2014-2015 academic year the International Relations continued the actions initiated during the previous year, but placing special emphasis not only on those related to foreign mobility but also those regarding internationalisation of the students who had not had this experience, this is the “*Internationalisation at home*” concept. These were, specifically:

- To promote and supervise that a third of the students from Degree and Masters courses have an international experience of at least one semester during their period of study.
- To promote “*Internationalisation at home*” by integrating the Incoming students in the university life and activity and establishing a semester entirely in English for each Degree course where possible.
- To manage the foreign exchange of students until reaching a magnitude suitable for the size of the HPS, so as to contribute to the Internationalisation of the Campus and its sustainability.
- To renew and activate collaboration agreements with foreign universities within the new European strategy, “*Horizon 2020*”. In particular, to work

on sharing networks and strategic alliances with other institutions which, in some cases, may lead to joint qualifications.

- To boost the participation of the HPS in the internationalisation process of local companies, both via its assistance in training a qualified workforce and by taking part in joint initiatives with foreign companies and/or institutions.
- To continue to coordinate and take part in European Projects such as the current Erasmus Mundus LAMENITEC (with Latin America) and INTERWEAVE (with Asia). The participation in programmes within the “*Horizon 2020*” framework programme is vital in order to increase the visibility of the HPS.

Below is a quantitative description of how some of these actions have materialised during the 2014-2015 academic year.

a. Actions aimed at promoting the mobility of students from the HPS.

- Monitoring and strengthening of the current double qualifications:
 - INSA Toulouse (France): Master in Industrial Engineering and Master in Embedded Systems.



- ENSEIHT Toulouse (France): Master in Energy and Power Electronics and Master in Embedded Systems.
 - ECN Nantes (France): Master in Industrial Engineering.
 - University of Skövde (Sweden): Master in Embedded Systems / Web Computing.
- Academic travel management (4th year of Degree, 2nd year of Masters and Doctorate Programme).

Out of the 170 people who have requested to leave in the 2014-2015 academic year, in accordance with their academic record and their level in a foreign language, 135 have embarked on a mobility experience under the following programmes:

- Studies Mobility: 93
- Projects Mobility: 41
- Doctorate Mobility: 10

The countries where our students have been destined for their studies are: Czech Republic, Italy, Finland, Germany, France, Switzerland, Netherlands, Mexico, Turkey, Sweden, Malaysia, Slovakia and Poland.

With regard to the countries in which they have carried out an end-of-degree/masters project, they

are: Sweden, Czech Republic, France, Germany, Belgium, Switzerland, Italy, Poland, United Kingdom, Greece, Denmark, Ethiopia, Austria, Portugal, Brazil and Mexico.

b. Actions aimed at improving Internationalisation at home.

- 106 foreign students, and from the rest of the country, have pursued studies in the HPS within the ERASMUS+, ERASMUS MUNDUS and SICUE programmes, and through inter-university agreements. The visiting students came from: France, Finland, Turkey, India, Bhutan, Nepal, Mexico, Columbia, El Salvador, Guatemala, Honduras, Nicaragua, Poland, Slovakia, Greece, Italy.

- Various welcome and integration activities have been organised through the Buddies system.

c. Actions aimed at assisting the internationalisation of companies and society.

- As part of the backing we provide for the internationalisation process of Basque companies, 6 students carried out their end-of-course and end-of-degree projects at Basque companies abroad: Czech Republic (4) and Germany (2).



CONTINUOUS TRAINING

HPS offers a wide selection of high-quality training programmes, with tailored, flexible all-round organisation. These include master's degrees, expert courses, advanced courses, specialisation courses and in-company training.

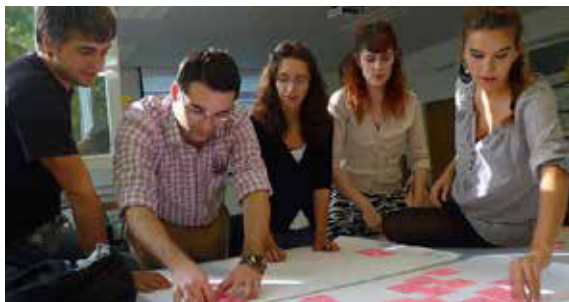
2,643 professionals have taken part in 340 training programmes during the 2014-2015 academic year, totalling 10,104 training hours. More and more companies are coming to us to obtain tailored training combined with a professional development plan and support in the use of methods and tools. 365 companies have trusted us throughout this academic year. 119 teachers have assisted these professionals in their learning process and the average satisfaction mark was 8.21.

Two courses related to professional certifications were run in the 2014-2015 academic year as part of the scheme organised by Lanbide, the Basque employment service. A total of 620 training hours in the courses on Swarf producing Machining and Manufacture of moulds of polymer and light alloy parts. In addition, via the Hobetuz programme, 10 courses were carried out, totalling 542 training hours. A total of 128 professionals have taken part

in these two professional training programmes for employment.

The third edition of the Executive Masters Degree in Operations Management came to an end in March 2015. A total of 10 professionals from various companies took part in this training programme. Michel Baudin has worked with us on this edition, talking to us about Manufacturing 4.0.

During the 2014-2015 academic year, a new edition of the Advanced Course on Maintenance Management commenced. With regard to quality, a DOE Experiment Design programme and an Advanced course on Lean-Six Sigma Black Belt level Continuous Improvement Programmes were developed. In the field of production engineering, several Advanced programmes were carried out regarding Industrial Management, both in our open offer and in tailored courses for several companies. After having achieved the certification of several professors of the university of the Demand Driven Planner Certificate, various conferences were organised to transmit this methodology to the companies. This enables our experts to train professionals in an innovative method for Materials Management, resulting in a dramatic reduction in stock levels, improved service and support for the implementation of this method in their companies.



More and more companies are demanding practical training and support in order to better acquire the knowledge.

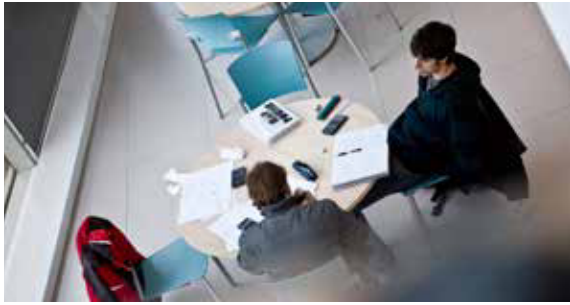
Here at the HPS, we believe that project management is a key competence for enterprise development, as it forms an essential part of companies' projects for change and innovation. In the 2014-2015 academic year, the PMP Certification Programme was run once again in Bilbao. Currently over 140 professionals have been certified and 85.3% of those certified in PMP in the Basque Country have trained with us. During this academic year, we have run a new edition of the advanced course and of the expert course, as well as 5 conferences on specific topics.

In this clear commitment to Project Management, in collaboration with InnoBasque, its partner companies and professionals from some of the country's leading companies which have already firmly committed to Project Management, it has been decided to create a Project Management Professional Community (Basque Project Management). A space to access and share information and knowledge concerning Project Management and Project Managers with a global and international focus, centred on people and professionals thirsty for knowledge with experience in the field of Project Management.

This Community is expected to be a meeting point for Basque professionals in the field of Project Management for sharing news, opinions, reflections and activities related to the field. Furthermore, the two founders of this initiative wish to stimulate another series of dissemination activities, such as forums and encounters which enable the participants' professional development.

In the field of Mechanical Engineering, more than 25 open courses have been taught in subjects including Industrial Design and Product Development, Materials, Manufacturing Processes and Maintenance. An increasing number of companies are turning to us for needs analysis and tailored course design, and we provide practical, applied guidance to offer solutions to their problems. In the 2015-2016 academic year, 12 in-company courses have been run with this approach. Together with AIC, we have launched the first edition of the course on Composite Materials, with a duration of 172 hours.

This academic year has hosted the 5th Edition of the "Design Konferentziak", in which 73 participants got together with the aim of creating a space for reflection on the professional career pathways which are available through design.



Another important event was the 6th Edition of the Expert Course on Patents in the business field, in collaboration with Galbaian, in the Bilbao Chamber of Commerce.

3 experimental workshops have been carried out on User-Centred Innovation.

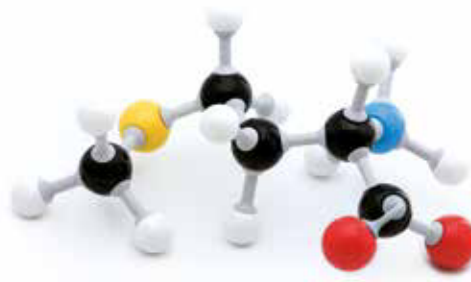
As in previous years, the Mondragón University ICT team organised and hosted more than 120 conferences connected with Digital Marketing as part of the Empresa Digitala initiative. It has also taken part in the Enoturismo Rioja Alavesa Forum in Librecon (National Congress of Free SW), in the Encuentros de Alcaldes de Navarra, WP Cantabria, Euskal Encounter, Araba Encounter, Interdigitala 2014, Week of ICTs Hernani, Bergara and Tolosaldea. The following conferences have been organised: Indusmedia, Interdigitala and WP Euskadi and 14 Technological Barnetegis. As a complement to the training, the team of ICT professors has provided support to 11 companies in their venture to implement these Digital Marketing tools in their companies.

To cater to the demand for our new degree courses, we launched a new series of adaptation courses for the on-line Degrees in Mechanical Engineering and Industrial Electronics Engineering. As well as the adaptation courses for the semi-distance Degree

courses in Computer Engineering, Telecommunications Systems and Industrial Design Engineering. The HPS offers an Online Industrial Organisation Degree training plan so that students can obtain a double degree. It is geared to mechanical, electronics, electrical, chemical and industrial engineering graduates, and over 100 professionals are taking part in the programme.

To make our offer more flexible and enable professionals to undertake more tailored training, this academic year included 5 on-line training programmes: Steel Designation, Manufacturing Process Quality, Integrated Logistics, Lean Manufacturing and an Expert Course in Computer Security.

We have been designing new ones throughout 2014-2015 for the 2015-2016 academic year. All this information is available on the new web platform www.mondragon.edu/profesionales.



RESEARCH AND TRANSFER

The Higher Polytechnic School has managed to continue strengthening its knowledge transfer and research activity during the 2014-2015 academic year.

Thanks to the companies who have trusted us, financing nearly 54% of the 10.6 million euros allocated to research and transfer. These numbers make us the university with the greatest relationship with companies (% of company-funded research) and several studies attest to us being the most highly valued in terms of Technological Transfer and Innovation (in both U-ranking and ISSUE-P).

One of the keys has, once again, been the wise decision of the Higher Polytechnic School to align its technological capabilities with the needs of the companies. The value added to companies by the HPS is reflected in the fact that 60% of this research financed by companies, mainly industrial, is related to the existence of a long-term collaboration research programme. The projects undertaken within the framework of these collaborative research and transfer programmes range from oriented basic research to industrial research and experimental development projects, which eventually lead to innovative products, processes and services. In addition, a long-term relationship allows us to align

our basic research with the company strategy and train the talent they require. All this results in a model with proven efficiency in the provision of a comprehensive and multidisciplinary solution to business requirements by effectively coordinating between the generation and the transfer of knowledge. With this model, we work with leading companies in their sectors, such as Orona, CAF, the Automotive and Components Divisions of the MONDRAGON Corporation, Fagor Arrasate, Ingeteam, ITP, Ampo, Fagor Ederlan, Ormazabal, Batz, Matrici, MSI, etc., but also with closer SMEs, with fewer resources and which require a more personalised service.

With regard to scientific production, we have published 38 articles during 2014-2015 in publications included in the Journal Citation Report (JCR), 53% of which were publications in the first quartile and another 24%, publications in the second quartile, which gives an idea of their quality. The majority of these results are related to the theses under way and are an indicator of the excellent work performed by the researchers of the Higher Polytechnic School. It is also worth noting that over 65 % of these doctorate theses are funded by private institutions.

An essential instrument which allows our Research and Transfer Groups to continue to be at the



forefront of knowledge is the Specialisation Plan, financed by the Department of Education of the Basque Government, and which we have managed to maintain during the last academic year. As for research financing in competitive tenders, according to the KT&R report by the CRUE (Board of Governors of Spanish Universities), the Higher Polytechnic School triples the average financing by university TRS. In this regard, the 2014-2015 academic year has been especially positive in the European competitions, where we have achieved nearly 8% of the financing of the research and transfer activity, with a total of 15 active projects. In the 2014-2015 academic year, eleven new European projects have been awarded, which imply a four million euro revenue over three years. In addition, it is worth highlighting that the Higher Polytechnic School is the leader for one of these projects, with a total budget of €30 million and 47 participants in 12 countries. Also worth noting is the financing obtained in competitions by the Provincial Council of Gipuzkoa, amounting to 11% of the research and transfer budget, with 15 active projects from their various competitions.

These are other projects active during the 2014-2015 academic year: 7 Collaboration Challenges and 2 Knowledge Generation (excellence) projects from the Ministry of Economy and Competition, 12 Eortek

of the Department of Economic Development and Competition, as well as having been involved in a total of 31 projects from the Gaitek/Etorgai of the same Department.

Lastly, it must be acknowledged that such achievements were fruit of the work of the researchers that comprise the 17 Research and Transfer Groups, grouped into the following Science-Technology units:

SCIENCE, TECHNOLOGY AND MATERIAL TRANSFORMATION PROCESSES

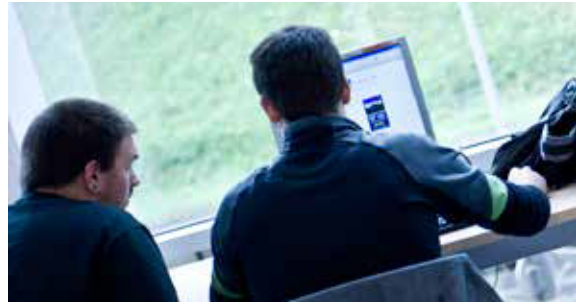
1. Plastics and Composites Technology.
2. High-Performance Machining.
3. Advanced Material Forming Processes.

MECHANICAL BEHAVIOUR AND PRODUCT DESIGN

4. Structural Mechanics and Design.
5. Acoustics and Vibrations.
6. Fluid Mechanics.
7. Surface Technologies.

ELECTRICAL ENERGY

8. Drives applied to traction and the generation of electrical energy.
9. Electronic power systems applied to electrical energy control.
10. Energy storage



INDUSTRIAL MANAGEMENT AND DESIGN PROCESSES

11. Innovation and Entrepreneurship.
12. Innovation in Industrial Design.
13. Productive Logistics Operations Management.

EMBEDDED SYSTEMS AND SMART SYSTEMS FOR INDUSTRIAL SYSTEMS

14. Software Engineering and Web Engineering.
15. Real-time Distributed Systems.
16. Telematics.
17. Signal Theory and Communications.

SCIENCE, TECHNOLOGY AND MATERIAL TRANSFORMATION PROCESSES

PLASTICS AND COMPOSITES TECHNOLOGY

This group's main objective is to create and transfer knowledge about composite structural applications that meet lightening/weight, cost and productivity criteria. Emphasis is placed on targeted research projects that develop plant-pilot level demonstrators or processes. The activity is organised into three areas:

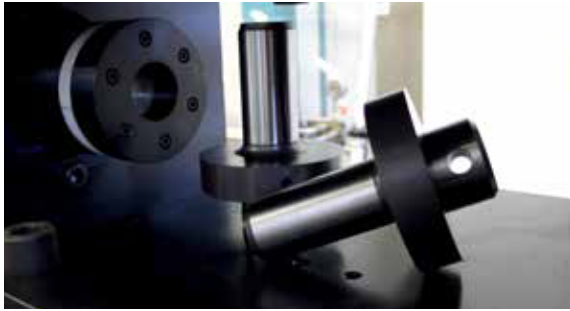
- Advanced resin transfer processes (RTM); thermoplastic RTM (TP-RTM), compression RTM (CRTM), hybrid material RTM (FML-RTM).
- Ultraviolet curing technology applied to; Pultrusion, Automatic Tape Laying (ATL), Filament Winding.
- Deformation and fracture of polymer and composites; Stamping/thermoforming, Impact/damage simulation, Morphing.

Industrial partners include companies from the machine tool sector (Fagor Arrasate), railway (CAF), civil engineering (Acciona Infraestructuras, Iruena), and sport (Orbea).

HIGH-PERFORMANCE MACHINING

The main goals of the High Performance Machining research group are to improve the machining production processes employed in different industrial sectors (automotive, aeronautics, health, machine-tool, moulds and dyes, health...) and to generate new ideas for manufacturing innovative products or entering new businesses or markets.

The general strategy pursued is to create, together with other research groups at the Higher Polytechnic School, multidisciplinary teams including personnel



from companies, research centres and universities, with a view to providing an advanced scientific response to industrial problems, to later transfer the knowledge directly or via highly qualified young adults.

Such is the case with (I) the definition of machining processes including the optimum selection of working conditions, tools and fastening equipment, (II) the approval of machining processes based on customer requirements and (III) the pre-industrial development and evaluation of new machining technologies and products.

The group has broad experience in the analytical and numerical simulation of machines and processes, as well as state-of-the-art machining equipment for milling, lathing, broaching, grinding, etc. and advanced experimental machining analysis techniques: high speed filming, thermography-based temperature measurement, scanning electron microscopy, etc.

The main work areas are machinability of materials, study of the cutting and modelling process, design of machining processes, high-speed machining, micro-machining, grinding, intelligent machining and biomachining.

ADVANCED MATERIAL FORMING PROCESSES

The general aim of the Advanced Material Forming Processes group is the experimental characterisation, development and optimisation of materials, processes and tool which make it possible to produce parts adapted to the purpose for which they were designed, at the lowest possible cost. Experimental characterisation includes, whenever possible, the production of prototypes in the HPS laboratories and the monitoring of processes in an industrial context.

Similarly, the group is working on the optimisation of forming processes via the use of monitoring and control systems specially adapted to each process, This is intended to reduce the impact of the involuntary variations of the process parameters or external agents on the final result.

It works on the development, application and experimental validation of advanced behaviour models of materials adapted to the various processes (deformation, fusion, solidification, etc.) as a tool to optimise the variables of the process and the design of tools. This includes, among others, multi-scale models which integrate mechanical, rheology, thermodynamic and microstructural evolution. The group has the necessary experience and know-how



to implement these models in numerical simulation programmes as a base for process optimisation and development.

MECHANICAL BEHAVIOUR AND PRODUCT DESIGN

STRUCTURAL MECHANICS AND DESIGN

Growing competitiveness means that not only is it necessary to create technical solutions to respond to market requirements, but that these solutions must also have as much added value as possible. On the one hand, structures are exposed to increasingly tough conditions, and on the other, they also need to fulfil an increasing number of functions.

The objective of this group is to contribute to the launch of robust products, providing material behaviour models together with techniques and numerical simulation tools that will enable the working behaviour of the products to be evaluated and optimised before their production begins.

In this regard, the group addresses the following lines of research:

- Thermo-mechanical fatigue and residual stress management: One of the group's main lines of research is that of Fatigue and Residual Stress Management. This makes it possible, with an emphasis on the product history, to improve its mechanical behaviour when faced with cyclic loading, either by modifying the design variables, process variables or by applying thermal treatments.
- Development and optimisation of mechanical components, prototypes and assemblies: Initially geared towards optimising transmission elements for sectors such as machine-tool or electric cars (gears, ball screws, joint bearings, etc.) as well as the characterisation of mechanical assemblies and systems (braking systems, brake-clutch, suspension systems) or the development of prototypes and sensitisation test benches.
- Advanced multi-stage modelling: The characterisation of the behaviour of products, machines and processes often presents a combination of various physical phenomena (mechanical, fluid, thermal, electromagnetic, chemical, etc.) which must be treated jointly. During the last few years, the group has specialised in advanced multi-stage simulation and has worked in sectors as diverse as mining (transporting mine slurry), energy (Stirling motor,



thermal management of batteries), HORECA (Generation of Residual Stress in glass blowing).

- Agile product development (CAx Automation): The transfer of technology to the company often requires a high level of qualifications, not available in the company. Therefore, the automation of tools for transferring and implementing this knowledge is key for productively integrating the developed knowledge in the company. The group has experience in both the development of customised tools and the automation of commercial CAD/CAE/CAM programmes (Solid Works, Unigraphics, ABAQUS, ANSYS,...).

ACOUSTICS AND VIBRATIONS

The Acoustics and Vibrations group of the Higher Polytechnic School works on the characterisation and analysis of vibration and acoustic emissions, with the aim of proposing practical solutions that optimise the vibratory and acoustic behaviour of industrial products and processes. Research activity is focused mainly on the following areas:

- Squeaky noise from brakes and clutches.
- Electrical machines.

- Monitoring of mechatronic actuators.
- FML Structures (Fibre Metal Laminates).

In addition to research, transfer projects are also carried out for:

- Identification of noise and vibration sources.
- Optimisation of behaviour through vibration and acoustic simulation and experimental contrast.
- Sound quality.

FLUID MECHANICS

This group is currently involved in three lines of research: Thermal fluidics; Complex Fluids and Magnetorheological Materials, and it is classified as a type-A excellence group by the Basque Government Department of Education, Universities and Research.

The group's objective is to generate new knowledge in basic research as well as in development and to carry out their technological transfer in the midterm, within the collaborative research framework.

The activities developed by the three lines of research combine models and methods, both analytical and



numerical, with experimental techniques to respond to problems of Fluid dynamics, Aerodynamics, Thermodynamics, and Heat Transfer, Microfluidics, Biotechnology, Transport Phenomena and Magnetorheological Material. The results of these activities have created new work synergies that materialise in collaboration with internationally renowned institutions, such as the European Space Agency (ESA), among others.

SURFACE TECHNOLOGIES

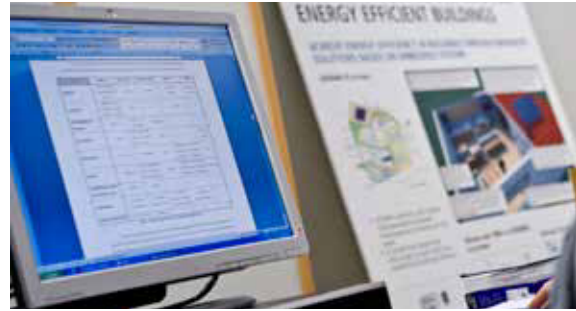
The aim of this group is to gain knowledge about and improve the properties associated with part surfaces including corrosion behaviour, tribological properties (friction, wear and lubrication) and optical or aesthetic and physical properties (thermal, electrical, magnetic) of products. This knowledge enables the working behaviour of the components or parts to be improved, reducing degradation or malfunctioning due to interactions with the atmosphere, working conditions and the properties of the components or parts themselves. Similarly, it makes it possible to transfer knowledge to the companies.

The main areas of research are as follows:

- Analysis of the working behaviour of the materials in relation to their surface properties (corrosion resistance, tribological properties, optical or aesthetic properties, thermal, electrical or magnetic properties, etc.)
- Development and control of materials, techniques and processes for advanced surface treatments and coatings, and optimisation of the current ones.
- Analysis, development and use of numerical simulation techniques and computer programmes as a tool for characterising the surface behaviour of the materials and improving the manufacturing processes associated with the products analysed.

These areas of research are focused on developing the following lines of work:

- Traction and guide systems.
- Health sector: development of implants and prostheses
- Tribology and corrosion in extreme conditions
- Functional surfaces



ELECTRICAL ENERGY

The future points towards a continuous increase of our society's energy consumption. With sights set on 2050, governments are promoting policies to improve energy efficiency, diversify energy sources and reduce the gas emissions into the environment. One of the key vectors for achieving these goals is Electric Energy.

The research group addresses the knowledge and the improvement of the use and transformation of Electric energy for applications related to transport networks and electricity distribution (distributed generation, integration of renewable generation systems, intelligent networks, active energy management, electric energy quality, etc.), traction (railway, marine and electric vehicle) or industrial goods (industrial process control, tool machine, elevation).

The specialisation lines are related to the area of power electronics, storage systems and electrical machines. The design area, linked to a detailed analysis of the final application, enables electrical-electronic equipment to be optimally designed and specified from the start of its development.

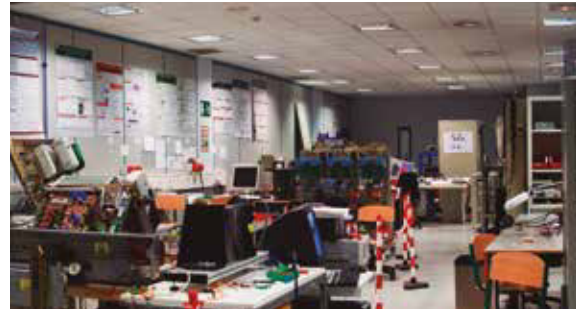
DRIVES APPLIED TO TRACTION AND THE GENERATION OF ELECTRICAL ENERGY

The aim of this research group is to develop the knowledge required for designing, modelling, simulating and controlling devices that use the principle of electromagnetism to function.

For the specific case of electrical machines, actuators and sensors, the aim is to master the process that includes the design, construction and production of the most suitable control system. The specifications for the design of these devices and their control system are specific for each application, and are taken into account from the first stages of development.

Thereby, the main issues to be tackled are:

- Modelling, simulation and control of electrical machines: design of vectoral, direct torque and specific power controls for each type of machine, as well as status observers, sensorless system design, adaptation of on-line and off-line parameters and automatic tuning of inverters.
- Design of Electrical Machines: design tools for electrical machines and actuators and analysis of their behaviour via advanced analytical models and finite-element techniques.



- Protection and Diagnosis in Electric Drives: Implementation of off-line and on-line algorithms for protecting the drive and early detection of failures in the drive or the application.
- Application analysis: The need to specify the electrical machine and the control system makes it necessary to master the final application. Therefore, particular emphasis is placed on knowledge acquisition in the fields of wind energy generation, vertical transport and electrical traction.

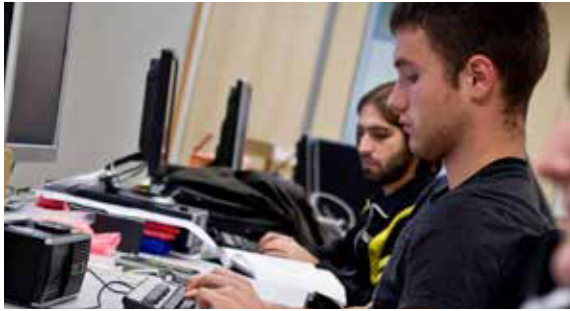
ELECTRONIC POWER SYSTEMS APPLIED TO THE CONTROL OF ELECTRICAL ENERGY

This research group develops scientific-technological knowledge about systems based on Power Electronics applied to the control of electrical energy. The progress made in the manufacture of high-powered semiconductors and the development of new conversion topologies now allows the tackling of applications for the integration of Distributed Energy Resources in the electrical distribution network: electricity generating microsystems, electrical energy storage technologies, devices based on power electronics to improve the supply quality as well as resources that control the electricity consumption or demand.

The integration of power electronics in the electrical system enables the study of its transformation with a view to making the system more reliable, flexible and intelligent, and the development of the concepts of distributed generation and active distribution.

The research group develops research activities in:

- Integration of new power electronic parts such as semiconductors based on silicon carbide or gallium nitride.
- Development of electronic power converters for different applications:
 - Electro-thermal and mechanical design, together with its refrigeration systems.
 - Modelling, simulation and control based on the application requirements.
 - Development of new converter topologies: multi-level, matrix, multi-pulse, etc.
- Devices connected to the transport and distribution network to improve supply quality: FACTS, Custom Power, Medium Voltage Switches, new protection systems for electricity distribution networks.
- Energy management and coordination of the electrical-electronic parts as part of intelligent networks for the integration of distributed generation systems based mainly on renewable energies.



ENERGY STORAGE

The research carried out by the group focuses on the development of scientific-technological knowledge of electrical energy storage systems. Mainly the electrochemical systems based on technologies such as batteries and supercapacitors, covering from cell level to modules and large storage systems.

The group plays an active role in joint projects with Universities, Technological Centres and local Companies, developing its activities in two Campus of the Higher Polytechnic School, in Arrasate and in Galarreta.

The Energy Storage research group develops research activities in:

- Complete electrical, thermal and mechanical design of storage systems based on electrochemical cells.
- Electrochemical and thermal modelling of cells and battery modules and super capacitors.
- Algorithms and electronics for management and protection of storage systems.
- Sizing of storage systems focused on the application as electric traction, integration of renewable energies and autonomous systems.

- Electrochemical storage system feature analysis and experimentation.

INDUSTRIAL MANAGEMENT AND DESIGN PROCESSES

INNOVATION AND ENTREPRENEURSHIP

The main mission of the Innovation and Entrepreneurship research group is to generate new knowledge in order to improve the implementation of entrepreneurship and innovation processes in companies and organisations through the development and implementation of entrepreneurship and innovation management tools and techniques, covering the full process of the innovation life cycle (from the ideas to their assessment as a new business activity), in addition to the modelling of strategic decision-making systems in order to encourage a management model based on proof, which favours the competitiveness of the local companies (mostly SMEs and microSMEs), either via the development of new frameworks, models or tools, or via the application of scientific criteria to increase the efficiency of the innovation processes or the adaptation of the organisations, their management models and employee culture with



a view to implementing the entrepreneurship and innovation strategies in the companies.

The Entrepreneurship and Innovation research group develops research activities in:

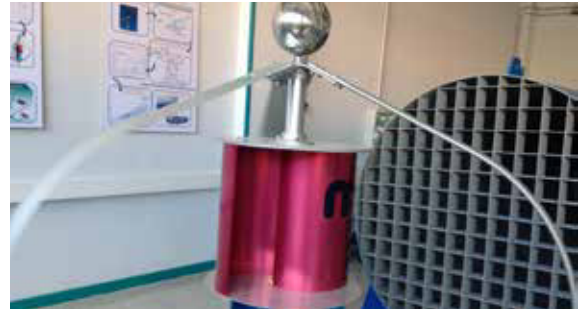
- Technology and Innovation Management: focusing Research on innovation processes, research on innovation management tools and techniques (IMTs) and Research on innovation networks, in order for the SMEs to develop more efficient innovation processes (individually or by networking), through the systematisation of innovation activities and the uses of techniques and tools adapted to fit their specific innovation characteristics, sectors and goals.
- Entrepreneurship: focused on entrepreneurship processes in organisations, the phenomenon of Entrepreneurial Universities (their models, objectives and processes to be implemented) and on university-company collaborative research, which will help companies, universities and other agents to fulfil their mission and develop new business activities with greater added value.
- Modelling of complex innovation processes: this field of research pursues complex innovation process modelling (innovation networks, value constellations, organisation models, etc.)

through simulation based on system dynamics and agent-based models. Furthermore, it works on the modelling of social-technical systems and dynamic social networks geared toward innovation and entrepreneurship.

- Strategic people management: focuses research on understanding how an organisation can promote certain behaviours in people which are more in line with its strategic needs in order to make it more sustainable. For this purpose, the research develops techniques and tools drawn from an accumulative database of over 60,000 cases from over 300 organisations.

INNOVATION IN INDUSTRIAL DESIGN

The main aim of this research group is to use innovation in industrial design to provide added value for products and services, to develop innovative products and services of value for a constantly changing market and to redesign or adapt companies' current products or production resources to different customers/users. All of this is with a people-centred design focus, where the users' needs, aspirations and abilities are the starting point.



For this purpose, the following activities are carried out:

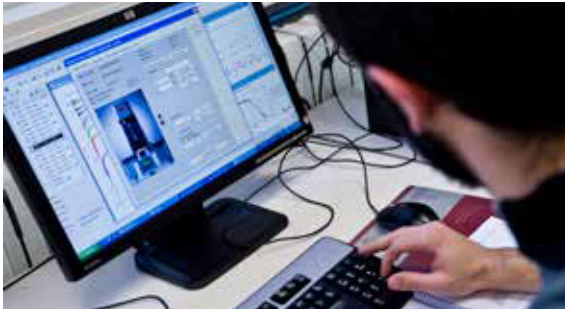
- Redefinition, strengthening or implementation of product/service development processes based on the person/customer-centred design method.
- Identification of user/customer and their needs.
- Product/service conceptualisation using cutting-edge creativity techniques, and all aspects of Industrial Design.
- Complete, detailed product/service specification
- Product or productive resource design and/or redesign in accordance with different criteria such as: minimum cost, range variety on the basis of product platforms, mountability, manufacturability, ease of use, interaction, etc. throughout its life cycle.
- Development of prototypes and models.

PRODUCTIVE LOGISTICS OPERATIONS MANAGEMENT

The increasing competitiveness forces companies to search for distinctive elements which give them competitive advantages at product service level and from a management perspective. As part

of the business Strategy, Logistics is key in this context in meeting customer needs. Defined as the company function which plans, manages and controls the organisation's resources in order to ensure its correct working order in accordance with the Service Strategy, it implies the coherent integration of the information and material flows through the entire productive and distribution system.

- Project Management: the study and improvement of project management in different contexts is generally tackled through the fundamental approaches, mainly PMBOK®, Critical Chain and Agile Project Management.
- Manufacturing Engineering: focused on industrial processes, through the study of the in-factory distributions design centred on Lean Production via related techniques such as VSM, OEE, cell design, SMED, 5S, Smart Manufacturing, etc.
- Industrial Asset Management: based on the assumption that the state and conservation of the industrial facilities and resources form a strategic activity to support a competitive productive system, the main areas of action are the design and optimisation of operational techniques (Corrective, Preventive, Autonomous



Maintenance, etc.), the organisational aspects in Maintenance Management, TPM and RCM.

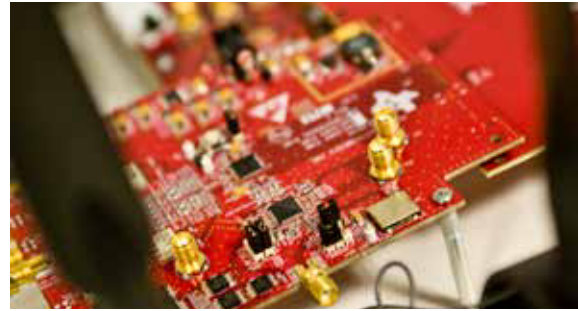
- Robust Industrialisation: the Industrialisation of processes in the life cycle is addressed, from the conception of the product until the end of its useful life. The key aspects which are most frequently addressed are the product reliability, the reduction of variability through the 6-sigma method, modelling and optimisation and data processing. Occupational health and safety improvement and assessment and the analysis of the environmental impact as part of the life cycle are other complementary aspects of special interest included in this area.
- Supply Chain Management: this area covers the different areas which take part in the management of the supply chain. The main objective of this area is to identify, visualise and study the key agents within the supply chain in order to manage them and thereby improve their flow. For this purpose, this area works on the following aspects: Lean Logistics, Process simulation, Distribution network design, Demand Driven MRP and TOC-DBR.

SISTEMAS EMBEBIDOS Y SISTEMAS INTELIGENTES PARA SISTEMAS INDUSTRIALES

SOFTWARE ENGINEERING AND WEB ENGINEERING

Information technologies and the actual software applications are becoming increasingly important in business management and product development, and today they are no longer auxiliary or peripheral aspects but key factors in companies' competitiveness and the success of their products. The Software Engineering and Web Engineering research group focuses its research activity on two areas:

- Industrialisation of the software development process to reduce costs and improve the quality of software products. For this purpose, it focuses on software product lines and model-driven software development as development paradigms that provide numerous benefits regarding the development of traditional software, such as reduced development times, increased quality, validation from the initial stages of the development, etc.
- Web engineering: In this area, the group researches Semantic Web technologies and Linked data structures from the perspective of open systems (open source and open data) and the design and development of interoperable platforms based



on web services and standards compliance, and the construction of Service-oriented architectures (SOA) to enable multi-platform and multi-device integration.

REAL-TIME DISTRIBUTED SYSTEMS

The Higher Polytechnic School Real-Time Distributed Systems team focuses its research activity on two areas:

- Sensorisation, Learning and Reasoning: “Development of Systems which by using sensors (artificial vision, temperature, pressure, presence...) learn and adapt their behaviour to act autonomously”.
- Real-time Embedded Systems: “Optimisation of the development process of real-time embedded systems by introducing techniques that improve productivity and reliability”.

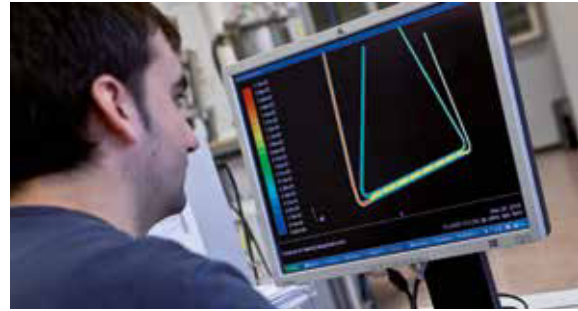
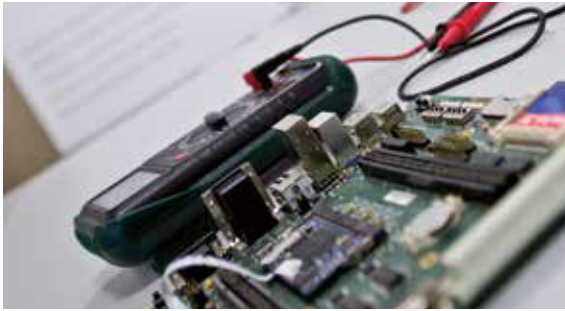
In order to tackle these two lines, the following knowledge areas have been defined:

- Learning, Deduction and Reasoning Models: Automatic Learning and Artificial Intelligence techniques (Data Mining, Case Based Reasoning, Fuzzy Logic, Neuronal Networks, Bayesian Networks, etc.).

- Distributed Systems, Communications, Middlewares: standards such as CORBA, ICE, ZeroMQ and RMI to create distributed applications in different environments.
- Concurrent Computing, Real-Time Panning: Real Time Operating Systems for Built-in Systems with the aim of developing applications that control different critical processes.
- Certifiable Embedded SW development and design: Development and design costs reduction and increase in the reliability of critical embedded systems when using methodologies based on the reusability of the critical SW components and technologies which enable testing and adapting of SW components in Runtime.

TELEMATICS

The Telematics research group is a group of multidisciplinary scientists that works in various areas. It is an eminently cross-sector area that contributes to most of the research themes and actions envisaged by European and national strategies in the fields of Energy, Transport, Climate Change, Intelligent Cities, Health and Information Society (the cloud, mobility, social media, data mining, etc.). It works on the following lines of research and knowledge areas:



- Information Security: The aim of this line of research is to tackle the new challenges that have arisen from the most recent developments and uses of information technologies, providing solutions to improve citizens' confidence in the new CIT landscape through research in secure and reliable technologies. Our research group is contributing in areas such as the following: Security of social networks, security of embedded systems, SCADA security, security of critical infrastructures, security of industrial control systems, or security of mobile devices and networks.
- Data Mining: This line of research focuses on applying the most advanced data-mining algorithms to various problems that we face in society and industry. More specifically, projects are developed for areas such as health, computer security, industrial processes, tourism, big data, linked data, etc. The knowledge areas covered by this line are as follows: Data mining applications (classification, grouping, optimisation), opinion mining, content curation, emotion and sentiment mining.

SIGNAL THEORY AND COMMUNICATIONS

This research group's research and transfer projects are focused on the design and implementation of signal processing systems applied to the following fields: communications (wireless and wired), image processing, systems monitoring and inspection in industrial processes.

- Communications: The key technologies that are being investigated in wireless communications are mostly robust MAC layers and modulations for use in industrial contexts. The use of Cognitive Radio and multi-antennae or MIMO systems are important examples of these technologies. The group's results stand out due to their practical approach and especially to their ability to implement these structures in FPGA-SOC and DSP.
- Artificial vision: The key technologies being researched in the image processing area are those geared to precision quality control, stereo vision and lasers in conjunction with other types of sensors (force, acoustic emissions), enabling overall control of the production systems.
- Monitoring and inspection: The group also applies the signal processing techniques in the field of process and component system



identification, monitoring and inspection. The advanced inspection systems developed are applied in both the industrial and biomedical field. In this respect, it is worth highlighting the developments in in-factory inspection methods and the integration of sensors in components, working generally in hostile environments.

- Real-time implementation of signal processing systems: Due to the group's vast experience in implementing algorithms and complex systems in microprocessors and FPGAs, it has specialised in the design and implementation of real-time systems for the fields of communications, energy, sensor systems or process control. These implementations are tackled from low level up to high-level tools based on graphic tools.

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3. Procedure to predict residual stress pattern in spray transfer multipass welding.
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4. Procedure to predict residual stress pattern in spray transfer multipass welding.
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5. New Hexagonal Three-Phase Voltage-Source Converter Topology for High-Power Applications.
A. Laka, J. Andoni Barrena, J. IEEE Transactions on Industrial Electronics. Vol.62. Nº 1. Pp.30-39. January, 2015.
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10. Optimizing Polymer Lab-on-Chip Platforms for Ultrasonic Manipulation: Influence of the Substrate.
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U. Iraola, I. Aizpuru, L. Gorrotxategi, J. M. Canales Segade, A. Etxeberria Larrazabal, I. Gil. IEEE Transactions on Energy Conversion. Vol 3. Nº2. Pp. 507-514. June, 2015.
13. Loading rate dependency on mode I interlaminar fracture toughness of unidirectional and woven carbon fibre epoxy composites.
H. Zabala, L. Aretxabaleta, G. Castillo, J. Aurrekoetxea. Composite Structures. Vol. 121. Pp. 75–82. March, 2015.
14. Quasi-static crush energy absorption capability of E-glass/polyester and hybrid E-glass-basalt/polyester composite structures.
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 19. [Model-based approach for elevator performance estimation.](#)
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27. [Fatigue analysis of multipass welded joints considering residual stresses.](#)
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38. An analytical approach to predict web-warping and longitudinal strain in flexible roll formed sections of variable width.
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42. Stability of machining induced residual stresses in Inconel 718 under quasi-static loading at room temperature.
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3. Active Teachers -Active Students: Proceedings of the 13th International Workshop Active Learning in Engineering.
Erik Graaff, Montse Farreras, Nestor Arexolaleiba. Aalborg Universitetsforlag , 2015.





MANAGEMENT AND SERVICES REPORT

RELEVANT INFORMATION

	2014-2015 Academic Year
Polytechnic Institute Students	225
Undergraduate Students	1.284
Master's Students	300
PhD Students	112
Students in International Mobility	140
Hours of Continuing Training	10.104
R&TD Budget ⁽¹⁾	10.616
Support Budget ⁽¹⁾	27,708
Ordinary Investment ⁽¹⁾	1.289
Staff	435

⁽¹⁾ Thousand Euros



GOVERNING AND SOCIAL BODIES

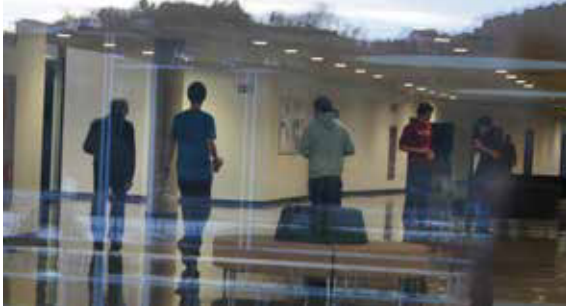
GENERAL ASSEMBLY

The General Assembly is held for the members to discuss and reach agreements on matters within their powers and it is chaired by the President of the Governing Board. It is made up of 221 Working partners, 221 User partners (students) and 221 Collaborating partners (companies).

GOVERNING BOARD

The Governing Board is the collegiate body responsible for managing and representing the Cooperative.

- PRESIDENT: Juan Maria Palencia
- VICE-PRESIDENT: Javier Oyarzun
- SECRETARY: Xabier Arrasate
- SPOKESPERSONS:
 - Carmelo Cortabarria
 - Jose txo De Frutos
 - Idoia Irazabal
 - Naroa Iturrioz
 - Antonio Matilla
 - Mikel Mendikute
 - Mikel Muxika
 - Jon Pedrazo
 - Javier Picavea



GENERAL COORDINATION

This is the body responsible for coordinating the school's activities and businesses, taking on leadership and responsibility for the MGEP project, and advising the Governing Board.

- GENERAL COORDINATOR: Carlos García
- ACADEMIC COORDINATOR: Nekane Errasti
- POLYTECHNIC INSTITUTE COORDINATOR:
Gorka Aretxaga
- RESEARCH COORDINATOR:
Roberto Uribeetxeberia
- CONTINUOUS TRAINING COORDINATOR:
Gentzane Aldekoa
- ELECTRONICS AND IT COORDINATOR:
Xabier Sagarna
- MECHANICS AND INDUSTRIAL PRODUCTION
COORDINATOR: Angel Oruna
- SYSTEMS AND MULTI-DISCIPLINARY SERVICES
COORDINATOR: José Luis Larrabe
- FINANCE COORDINATOR: Milagros Arregui

SUPERVISORY COMMISSION

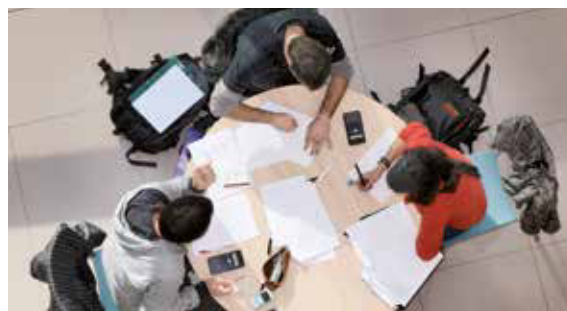
The Supervisory Commission is the body responsible for the duties of review and control of the cooperative.

- Belén Cortabarría
- Fernando Murgiondo
- Beñat Ochoa de Erive

SOCIAL COUNCIL

The Social Council is the body that represents the partners and working partners and has information, advice and consultancy as its basic functions.

- Gonzalo Abad
- Andrea Aginagalde
- Pedro M^a Amallobieta
- Javier Arkauz
- Jone Arregui
- Haritz Barrutia
- Amaia Gomendio
- Nagore Lauroba
- Aitor Orue
- Obdulia Vélez
- Iñigo Zendegi



GENERAL AND MULTI-DISCIPLINARY SERVICES

All the services offered by the Mondragon Polytechnic School have the mission to support teaching, learning and research and contribute to the achievement of our Institution's goals.

One of our current challenges is the planning and sustainable and efficient management of the services we offer the community, mostly related to teaching, research and continuous training throughout people's lives. In order to achieve sustainable services which satisfy our various clients' needs and expectations, we have implemented several strategies and proposals through the following projects:

The different needs of the educational community and the MONDRAGON UNIBERTSITATEA's own educational models, which places the student at the heart of the teaching-learning process, have meant that the Library and Information Systems Services have worked on developing a new, more user-centred model for offering services. This collaboration has been consolidated in the design of a new Library-ICTs web space which combines the services offered by both areas. This new space will be presented during the 2015-2016 academic year.

The Library continues to work on enabling the exchange of knowledge and universal access to information. For this purpose, it has become a member of Worldcat, the largest international cooperative network of libraries, into which it has fed over 100,000 records from its catalogue. Worldcat provides our collections with greater international presence and visibility and gives us the opportunity to work with the global academic community.

The collaboration of the Library Service with the research and academic management areas has been accentuated during this year, providing support in the bibliometric analysis of research documents. At this moment in time, the library offers a Bibliometrics service and provides data concerning impact indices in both the Journal Citation Report and Scopus. It also assists the researchers and teachers in this respect.

Along this same line of collaboration, the ORCID identifier has been created for all the teaching and research staff of the School and they must relate each ORCID identifier with the publications and the Scopus identifier.



With regard to information systems, during this year we have continued to work on the 1 student-1 laptop project. This project has been addressed since the 2010-2011 academic year via several formulas. The main goal is still to achieve a situation where the student can work with their laptop outside the University. This year, the applications have been virtualised and distributed among the students so they can run them locally on their laptops. This means they can work anywhere, using the same tools they use at the University.

With the intention of continuing to unify and centralise the academic service applications, a new enrolment application has been designed and developed. The databases have been centralised and, in turn, a new function has been incorporated for exchange students.

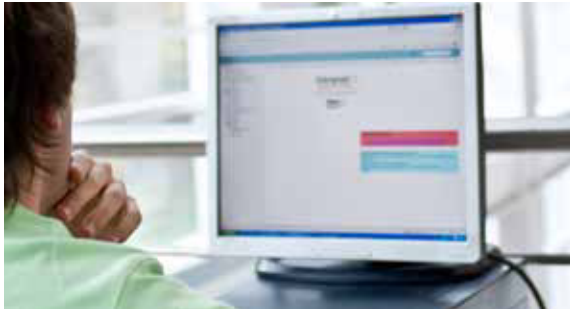
Continuing along these lines of unification and centralisation, we have begun to work on unifying the directory of users for the entire student body and the staff of MONDRAGON UNIBERTSITATEA. The aim in unifying this directory is for each student and employee of the MONDRAGON UNIBERTSITATEA to work from any faculty of the University.

As a response to two of the challenges of the strategic plan in the 2013-2016 cycle (the implementation of MGEP in the Donostialdea Technological Campus and the development of training and research in 3 new fields - health, energy and sustainability), the following have been implemented:

The spaces in the library mezzanine of the fundazioa building in IDeO, to be used by the students as group work spaces.

2,400m² in building 11 to locate the degree, masters and training cycles in electronics. We have therefore freed up the 2nd floor of building 3 so we can establish the biomedics degree there, renewing the vertical, floor and furniture layouts. Administration continues working on the design of web forms in order to enable the completion of documents and administrative processes. This year we have implemented forms for settling travel costs and standardised material orders and we have started to analyse the process and design of the form for subcontracting external teachers/speakers.

The development of the management system computer programme has also been key.



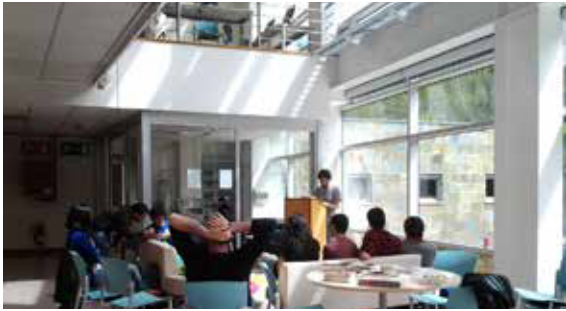
In collaboration with all the faculties and MONDRAGON UNIBERTSITATEA, during the 2014-2015 academic year, work has continued on the design and development of the KUDE computer application, which was created to give the Management System a manageable, efficient IT resource. Above all, we have worked on aspects related to the agents involved in the processes and procedures and the inclusion of instructions in the Management System.

BITERI HIGHER COLLEGE (CMB)

The 2014-2015 academic year began in September with a total of 108 students, 82 of whom, including students of the HPS, HUHEZI and ENPRESAGINTZA, were just beginning their studies at the Higher College. In addition, the fact that 11 foreign students have stayed at our University Residence Hall has implied an opportunity for cultural exchange which has been recognised and valued by our students.

The Residence Hall collaborates with the integrated training of the HPS student body through different levels of organisation. Firstly, it plays an active role in formal training by working with different departments of the university; secondly, we carry out academic monitoring of our students in conjunction with the semester coordinators; and, lastly, through the certification of extracurricular *ECTS*.

To this end we organise the house into work groups and assign duties to our students. These duties are monitored through group and individual tutor meetings.



ACTIVITIES RELATED TO FORMAL EDUCATION:

We have continued to actively support the mechanics qualification in the subject *Methodological fundamentals*. The design of the 12 hours taught from Biteri to take a deeper look into team work is now final, and the valuation given by both those responsible for the subject and the actual students has been very positive. This module was taught in both groups of the Arrasate campus and in a third group of the Goierri campus.

We also collaborated in the organisation qualification. This time the goal was for the group to start to function as such as soon as possible, for a better academic performance. Once again, the parties involved were highly satisfied by the work and we are weighing the possibility of designing a more comprehensive model.

ACTIVITIES RELATED TO NON-FORMAL EDUCATION:

The extra academic activities space is progressively gaining strength as a valid, fun and efficient training environment. Out of the total credits requested by the students, we have certified 77.5% (93 out of 120). The challenge is to motivate the remaining

students of the Higher Polytechnic School to obtain these types of credits.

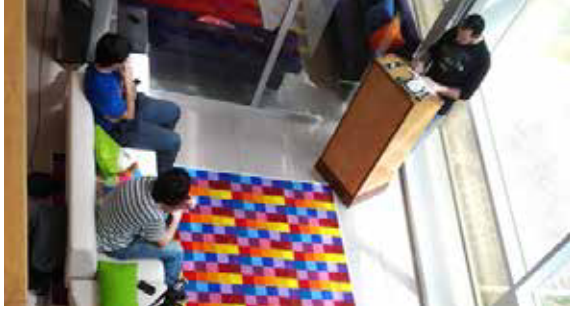
The list of activities drawn from the extra academic activities space was as follows:

Charity Area

- Charity football in the Ibaiondo educational centre.
- Talk by an educator from the Ibaiondo educational centre.
- Talk by a teacher from the Arrasate Public School.
- Talk by an educator from the Urgatzi centre for minors.
- Volunteer work in the *Harrera Gela* of the Arrasate Public School.
- Three blood donation sessions.
- Haima: direct solidarity action in the Urgatzi centre for minors.

Sociocultural Area

- Skiing trip.
- Paintball in Bedoña.
- Organisation of fancy dress competition and outing to the Tolosa carnivals.



- Cultural visit and dinner at Astarbe Sagardotegi.
- Talk: Aitor, Historia de Navarra.
- Talk: Lanbide, Ikasketak eta gero zer?.
- Talk: Euskadi-Cuba. “Cuba-USA: ¿Fin del bloqueo?”
- Internal and external communication of the Biteri activities.
- After having received training from TUMAKER (3D printing, Arduino, etc.). technological projects development.
- Design and manufacturing of goitiberas in the form of a tricycle called DriftTrike. Organisation of an event in which to use them.
- To learn how to knit to make winter clothes.
- Cooperativism.
- Bertso Afaria and chocolate party.
- Training in magic and juggling. Organisation of an event to put acquired skills into practice.

Student representation area

- Coordination of the working order and in-house activities.
- Representatives of the various commissions take part in the decision-making along with the CCMM director.
- Organisation of the Academic Year Opening Ceremony.

- Participation in sessions on cooperativist values, energised by the Arizmendiarieta Friends Association.

Sports and Health Area

- Training and participation in skating races.
- Monthly outings to see the Basque mountains.
- Training and participation in popular races.
- Integral personal care and health.
- Internal sports championships.
- Mus championship between CCMM of Euskadi.
- Internal organisation of the emergencies team.
- Coordination with those responsible for the restoration service in order to improve the students’ diet and the service.
- Donors, including for bone marrow. Alava Association of Donors.
- Gehitu: Sexually transmitted diseases.
- Fencing. By Naiara Aldama, professional fencer.



ACTIVITIES RELATED TO INFORMAL EDUCATION:

To grow, taking responsibility, is what makes a person feel an active part of and owner of their personal development. The range of opportunities generated among everyone at Biteri, could not happen without a great deal of enthusiasm and curiosity to try out new things, different things, exciting things. Young people bring such qualities as standard and it is our duty not to hinder or exhaust these qualities.

Thus, it is in everyday life where the ability and the opportunity for personal development of our collegiate is born. And it is there that the support and guidance of three professionals may be found who are dedicated in the offering of support, with no further aspiration than to push in the same direction as the student.

The monitoring tutorials that we hold with the students provide the tools that allow them to become aware of their personal development from three fundamental aspects: multi-disciplinary skills, academic situation and emotional balance. The tutorials are at least monthly.

EXTRACURRICULAR ACTIVITIES

The aim of the sports service is to promote an active lifestyle among students and staff working at Eskola, providing facilities and offering the possibility of various physical and sports activities. In addition to the activities themselves, the sports department works on various projects to provide a better product and communication with the entire group of students and staff via a computer system that facilitates their enrolment in activities. It sets up collaboration agreements with the various sports organisations in the area to provide access for the students and staff to their facilities and programmes.

During the 2014-2015 academic year, 526 students participated in the following activities (without taking into account the 300 participants in the health week activities for which registrations were not made):



COMPETITIONS

In the various championships organised: within the faculty, inter-faculty, Basque and state, the participation was 314 students. Furthermore, a total of 21 students competed in the various championships of the university itself such as: Go-Karting, Surfing and Herri Kirolak.

PROMOTION OF SPORTS ACTIVITY AND HEALTH

238 people participated in:

a) Courses and outings

Various courses and outings were arranged where students had the opportunity to learn about new types of sports or to practice familiar ones. Courses such as surfing, climbing, canoeing and go-karting and skiing outings were organised involving a total of 105 students.

b) improving physical fitness

This section includes the students who enrolled in both public and private gyms to practise physical

activity, taking advantage of our agreements with such centres, with there being a total of 26 students enrolled and registered.

RENTING FACILITIES AND BORROWING EQUIPMENT

This service, which allows students and staff to practise their favourite activity on their own, was a great success with 140 people making reservations or renting equipment.

ADDITIONAL ACTIVITIES

This section covers all the activities related to physical activities that do not involve their actual practise, such as attending Laboral Kutxa Baskonia matches, organised talks, etc., in which 233 students took part.

It should be noted that more than 300 students participated in the activities that were organised for health week, an amount that has not been added to the overall indicators for the service due to the fact that registration in the sports department for these activities was not necessary, thus making it



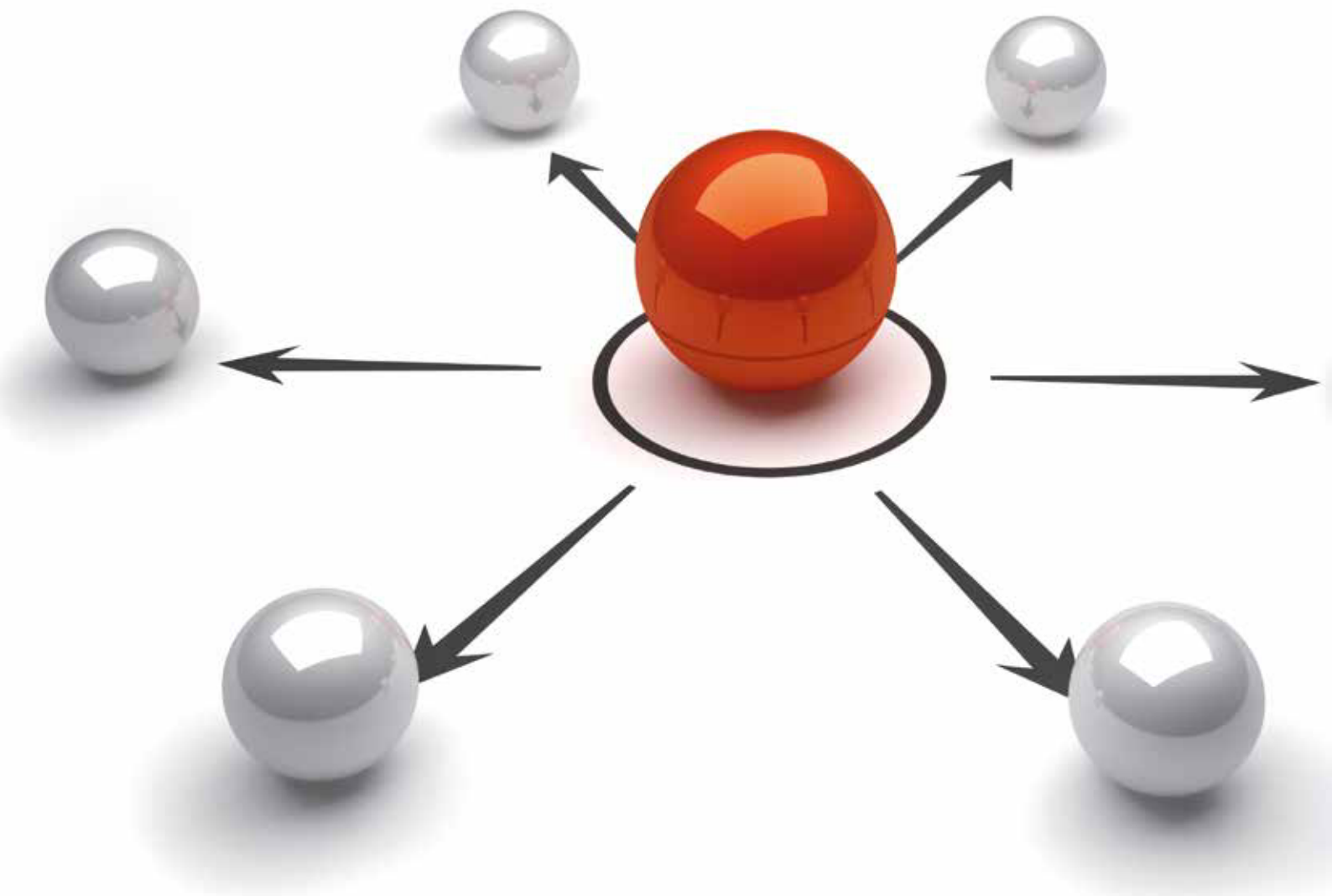
impossible to tell if these people participated in other activities or not.

WORKER PARTICIPATION

The sports service has encouraged workers in Eskola to practice sports, adapting activities to fit in with their timetables. Thus, during the 2014-2015 academic year, there were 62 workers who participated in the activities organised.



COLLABORATING COMPANIES AND INSTITUTIONS



COLLABORATING PARTNERS

- ABEKI COMPOSITES, S. L.
- ALECOP, S. COOP.
- ALEJANDRO ALTUNA, S. A.
- AUSOLAN, S. COOP.
- ASMOBI, S. L.
- CAJA LABORAL, S. COOP.
- COPRECI, S. COOP.
- EKIDE, S. L.
- ENERGÍA PORTÁTIL, S. A.
- FAGOR ARRASATE, S. COOP.
- FAGOR, S.COOP
- FAGOR AUTOMATION, S. COOP.
- FAGOR EDERLAN, S. COOP.
- FAGOR ELECTRÓNICA, S. COOP.
- FAGOR INDUSTRIAL, S. COOP.
- FUNDACIÓN GIZABIDEA
- GALLASTEGUI Y CIA, S. A.
- GOIZPER, S. COOP.
- IDEKO, S. COOP.
- IKERLAN, S. COOP.
- LANA, S.COOP.
- LKS, S. COOP.
- MONDRAGON CORPORACIÓN COOPERATIVA SOCIEDAD CIVIL
- MONDRAGON ASSEMBLY, S. COOP.
- ULMA AGRÍCOLA, S.COOP.
- ULMA CONVEYOR COMPONENTS, S. COOP.
- ULMA C Y E, S. COOP.
- ULMA EMBEDDED SOLUTIONS, S. COOP.
- ULMA FORJA, S. COOP.
- ULMA HORMIGÓN POLÍMERO, S. COOP.
- ULMA MANUTENCIÓN, S. COOP.
- ULMA PACKAGING, S. COOP.
- ULMA PACKAGING TECHNOLOGICAL CENTER, S. COOP.
- ULMA SAFE HANDLING EQUIPMENT, S. COOP.
- ULMA SERVICIOS DE MANUTENCIÓN, S. COOP.
- GRUPO ULMA

COLLABORATING PUBLIC INSTITUTIONS

- MONDRAGON TOWN HALL
- GUIPUZCOA DISTRICT COUNCIL
 - Department of the Environment and Territorial Planning.
 - Department of Innovation, Rural Development and Tourism.
- BASQUE GOVERNMENT
 - Department of the Presidency.
 - Department of Education, Linguistic Policy and Culture.
 - Department of Economic Development and Competition.
 - Department of Employment and Social Policies.
- CENTRAL GOVERNMENT
 - Ministry of the Economy and Competitiveness.
 - Ministry of Industry, Energy and Tourism.
- CE: EUROPEAN COMMISSION
 - ARTEMISIA.
 - ECSEL.
 - ERANETS.
 - Erasmus Plus.
 - Seventh Framework Programme.
 - European Regional Development Fund (ERDF).
 - European Social Fund (ESF).



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