



Programmatic document on the School's policies

December 2019

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|--|-----------|
| INTRODUCTION | 4 |
| THE STARTING POINT: RESULTS ACHIEVED BY THE SCHOOL AND ITS ORGANISATION | 4 |
| SCIENTIFIC RESEARCH AND HIGHER EDUCATION | 5 |
| UNIVERSITY TRAINING | 7 |
| DEVELOPMENT OF THE SCHOOL OVER THE LAST DECADE | 9 |
| THE FEDERATION | 10 |
| OUR MISSION TODAY AND TOMORROW | 11 |
| THE STRATEGIC GOALS | 13 |
| RESEARCH | 13 |
| RESEARCH GOAL 1 | 13 |
| RESEARCH GOAL 2 | 14 |
| RESEARCH GOAL 3 | 14 |
| THE INSTITUTES' RESEARCH GOALS | 15 |
| THE BIROBOTICS INSTITUTE | 15 |
| THE INSTITUTE OF LAW, POLITICS AND DEVELOPMENT (DIRPOLIS) | 16 |
| THE INSTITUTE OF ECONOMICS | 17 |
| THE INSTITUTE OF MANAGEMENT (IDM) | 18 |
| THE INSTITUTE OF LIFE SCIENCES (ISV) | 19 |
| THE INSTITUTE OF COMMUNICATION, INFORMATION AND PERCEPTION TECHNOLOGIES (TECIP) | 20 |
| TRAINING | 21 |
| TRAINING GOAL 1 | 22 |
| TRAINING GOAL 2 | 25 |
| TRAINING GOAL 3 | 25 |
| TRAINING GOAL 4 | 27 |
| TRAINING GOAL 5 | 28 |
| TRAINING GOAL 6 | 34 |
| TRAINING GOAL 7 | 42 |
| TRAINING GOAL 8 | 43 |
| THE THIRD MISSION | 45 |
| FROM STRATEGIC GOALS TO ACTIONS: ORGANIZATION AND OPERATING MECHANISMS | 49 |
| THE RECRUITMENT PROCESS | 49 |
| THE ORGANIZATION CLIMATE AND THE MANAGEMENT AND INTERNAL COMMUNICATION PROCESSES | 49 |
| THE ORGANISATIONAL STRUCTURE | 53 |
| THE LOGISTIC STRUCTURE | 55 |
| THE CURRENT STATUS | 55 |
| SCHEDULED INTERVENTIONS | 56 |
| FUTURE PROSPECTS | 57 |
| THE ECONOMIC-FINANCIAL PLAN | 59 |
| THE ECONOMIC AND FINANCIAL SUSTAINABILITY IN THE STRATEGIC PLAN | 59 |

Introduction

This document is the English translation of the “Documento programmatico sulla Politiche della Scuola”. That document included 5 appendixes which are not translated here for the sake of brevity.

This document starts with the preparation of the 2019-2025 Strategic Orientation Plan, which represents a chance for the Sant’Anna School of Advanced Studies to reflect on its future goals, on the necessary action to achieve those goals and, more in general, on useful tools for the improvement of the national and international ranking of the School and its contribution to the competitiveness of the Country system.

The preparation of the Strategic Orientation Plan involved a detailed process including multiple consultations and discussions. A series of meetings were arranged from May 2019, the month in which the mandate of the Rector of the School began; the meetings have been organized with all the members of the School in order to launch a process of debate at every level.

Moreover, four working groups were activated, composed of teaching staff and technical and administrative staff and dedicated to further exploring the challenges relating to Research, Training, the Third Mission of Higher Education and Internationalisation strategies. Further teams were established to structure renewal projects in order to adapt the School’s capacity to future challenges. The material prepared by the working groups is available at the School.

During the summer, an *organization climate survey* was launched, involving the participation, in extremely high percentages, of all members of the School (63% of the staff, overall), which allowed to collect useful opinions and ideas for the preparation of this plan. The results of the survey are also available on the School intranet site.

On the basis of the results of the above actions, this document was first discussed with the International Advisory Board (IAB) at the end of June, and subsequently, from July to September, was further discussed with the Board of Institute Directors and Institute Committees, the Institute Boards and technical and administrative staff, as well as with the students’ representatives.

Finally, on 23 September 2019 the “Stati Generali” (general assembly) of the School were organized: it was a meeting at which all members of the School were invited to participate and that represented the overall dialogue prior to collecting the final opinions of the Institutes, the Faculties and the Council of the technical and administrative personnel. The plan was translated into English between the end of September and early October and sent to the members of the IAB, who commented the plan telematically and during a series of teleconferences. After a second revision, the Strategic Plan was presented to the Senate and to the Board of Governors.

The process of preparation of the strategic plan has been a novel process for the School and represents a method for the systematic improvement of both listening and dialogue sessions, intended to guarantee cohesion and sharing of intents.

The Strategic Orientation Plan is the document that will set the basis of the annual and three-year syllabus, which will be monitored. This document summarizes the actions planned for the next three years with particular attention to the next year, identifying the levels of responsibility, the offices involved, the specific objectives, also in quantitative terms, and integrated with the economic and financial budget plans.

The starting point: results achieved by the School and its organisation

In consideration of the fact that the School is a public university, the Strategic Orientation Plan is an essential tool for the purpose of steering the institution to pursue its mission of producing “value” for the community, in those areas in which it conducts its activities.

Although it is a young University, formally established in 1987, the School has extremely good national and international standing and ranking, both in the field of academics and research and in the broader field of institutions and the business world. Extremely recent confirmation of the above has been provided

by THE Times Higher Education World University Rankings.







| | |
|---|--|
|  | Times Higher Education World University Rankings 2020 <ul style="list-style-type: none">• 1th place on a national level out of 45 institutions• 149th place out of 1,396 international institutions• 7th place in the top 250 best young world universities (2019) |
|  | QS World University Rankings 2019 <ul style="list-style-type: none">• 2nd place on a national level out of 30 institutions• 177th place out of 1.010 international institutions• 15th place in the top 150 best young universities |

The Sant'Anna School of Advanced Studies is one of the six special-statute public universities, known as Scuole Universitarie Superiori (Schools of Advanced Studies) operating in Italy. It engages in research and education in the field of applied sciences.

Scientific research and higher education

Scientific research and higher education courses (PhD program, Master's degrees and first and second level Master's diplomas, higher education courses) are carried out in the context of its six Research Institutes: BioRobotics, TeCIP (Communication, Information and Perception), Life Sciences, Management, Economics and DirPoliS (Law, Politics and Development).

The Research Institutes

| | | | |
|---|--|---|---|
|  | BioRobotics, biomedical engineering and robotics for medical and biological applications |  | (DirPoliS) Social sciences, with specific reference to legal and political sciences |
|  | Economics, Macroeconomics, econometrics, dynamic system models |  | Management, organisation and management of innovation, sustainability and health |
|  | Medical sciences, agricultural sciences and biotechnologies |  | (TeCIP) embedded real-time systems, network sensors, photonic and bio-photonic technologies, virtual environments and robotic systems |

Alongside the six institutes, in 2018 two departments of excellence were established, EMbeDS (Economics and Management in the era of Data Science) and Robotics and Artificial Intelligence (AI). The Departments of Excellence (Dipartimenti di eccellenza) provided by Law 232, 2016 (2017 Budget Law) were selected within national universities by a Commission specifically appointed by the National Department of Education, on the basis of the quality of research produced (results of VQR 2011-2014) and of development projects submitted to the Department of Education.

The Departments of Excellence



Robotics & AI stems from a collaboration between the Institute of Biorobotics and the TeCIP Institute



EMbeDS stems from a collaboration between the Institute of Economics and the Institute of Management

The EMbeDS Department of Excellence uses opportunities offered by Data Sciences in the areas of Economics and Management. The Robotics & AI Department of Excellence stems from a collaboration between the BioRobotics Institute and the TeCIP Institute (Communication, Information and Perception Technologies).

Research is conducted within the Institutes, which are equivalent to University Departments that have, since 2010, programmed and managed their activities, enhancing the relationship between training and research, interdisciplinarity and interaction with the social, economic and cultural world. The institutes are in turn organised into research/laboratory areas focused on specific activities. As shown by the climate survey mentioned above, these research areas represent the main reference for the efficient work of the staff, research fellows and temporary research fellows for the development of their research activities.

Within the Scopus bibliometric database, the School has a portfolio of 8,800 publications with a h-index value of 136. In the ISI-WoS database the School has 7,307 scientific products, with a h-index value of 118 and an average of 14.11 citations per publication. We should also mention the percentage of articles in top journals (belonging to the first quartile of the Scimago Journal Ranking), the weighted citation impact (which provides an indication of the number of citations normalised according to disciplinary area, where the unit value indicates the global average) and publications in Class A of ANVUR (Figure 1).

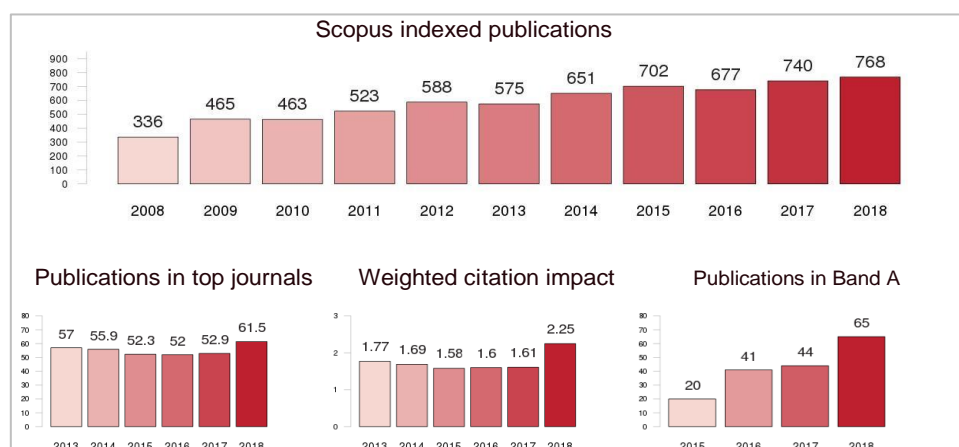


Figure 1 - Data on the Scientific Publications of the School

The high number of research projects (Table 1), the majority of which are international, has enabled the School to contribute to funding its research and to develop entrepreneurial ideas and innovative technologies capable of stimulating the creation of new spin-offs and the transfer of results. We should emphasize the extremely high level of international research funds obtained by the School on a competitive basis. In 2019 the School performance on the Horizon2020 programme included 55 approved projects, 9 projects allocated as coordinator and a total of Euro 19.785.033 in funding¹; the Scuola is the frontrunner in Italy in consideration of the personnel staff.

¹ Projects value for the School

Table 1 – Project Financing

| | year | | |
|--|-------------------|-------------------|-------------------|
| | 2016 | 2017 | 2018 |
| Commissioned (on behalf of third parties) | 4,698,643 | 4,742,209 | 4,669,796 |
| Competitive funding from Dept. Of Education | 3,915,085 | 675,221 | 673,385 |
| Competitive funding from other Ministries | 587,204 | 485,253 | 438,003 |
| Competitive funding from EU and international bodies | 5,926,316 | 5,027,730 | 4,220,941 |
| Competitive funding from other public bodies | 3,259,954 | 6,634,817 | 7,340,872 |
| Competitive funding from private bodies | 567,270 | 680,651 | 819,734 |
| Total | 18,956,488 | 18,247,898 | 18,164,749 |

The following graph (Figure 2) illustrates historical performance in research revenues².

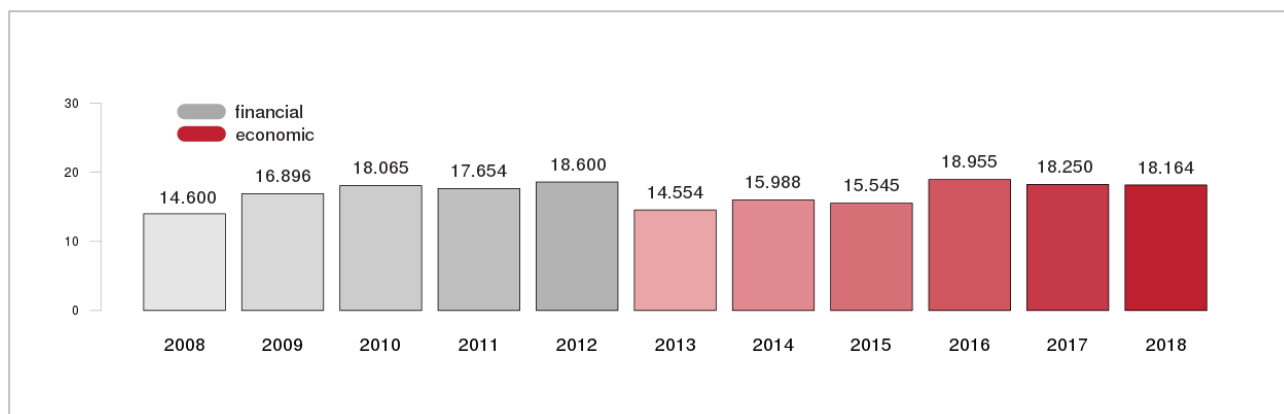
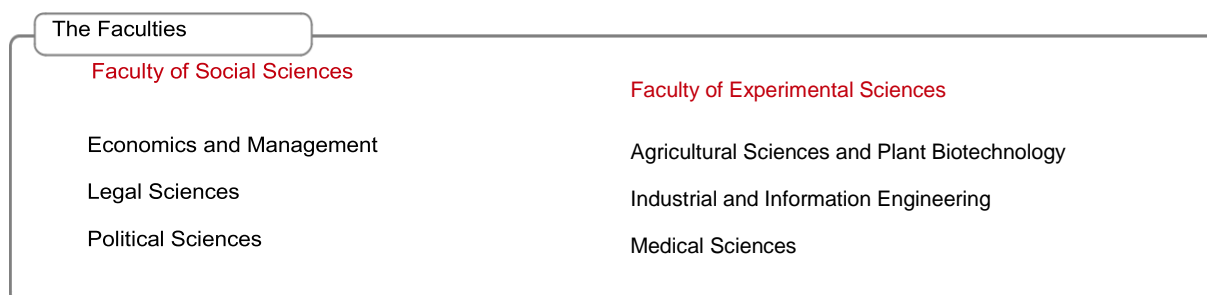


Figure 2 – Research revenues

University training

First and second level university training are addressed to students (honours students), admitted only if they have passed a national competitive entrance examination. Teaching activities are conducted within two Academic Faculties (Classes), each one including three Scientific Sectors:

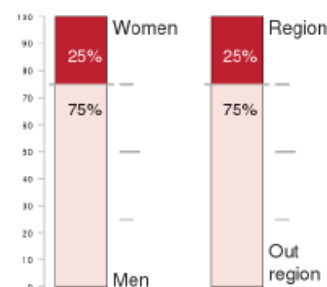


² Due to the different accounting systems data collected from 2013 are not comparable to the past trends

Tabella 2- Honours Students

| Course | Students | | | of whom from other regions |
|---|----------|----|-----|----------------------------|
| | M | F | Tot | |
| Economics and Management Sciences | 41 | 8 | 49 | 35 |
| Legal Sciences | 35 | 18 | 53 | 42 |
| Political Sciences | 31 | 11 | 42 | 33 |
| Agricultural Sci. and Plant Biotechnology | 13 | 11 | 24 | 16 |
| Industrial and Information Engineering | 56 | 2 | 58 | 36 |
| Medical Sciences | 41 | 22 | 63 | 55 |
| School Total | 217 | 72 | 289 | 217 |

Data at 31 December 2018

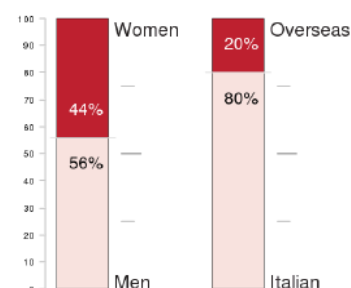


In addition to training the honours students (Table 2), the School is involved in 7 Master's Degree programmes in collaboration with other universities which act as the administrative office, including the University of Pisa, University of Trento and the University of Florence (Table 3).

Table 3 - Master's Students³

| Course | Students | | | of whom overseas |
|------------------------------------|----------|-----|-----|------------------|
| | M | F | Tot | |
| MS Bionics Engineering | 35 | 24 | 59 | 17 |
| MS Molecular Biotechnologies | 16 | 14 | 30 | 1 |
| MS Computer Science and Networking | 38 | 4 | 42 | 13 |
| MS Economics | ND | ND | ND | ND |
| MS Embedded Computing Systems | 41 | 7 | 48 | 5 |
| MS Innovation Management | 36 | 24 | 60 | 10 |
| MS International Security Studies | 21 | 27 | 48 | 9 |
| School Total | 187 | 100 | 287 | 55 |

Data at 31 December 2018

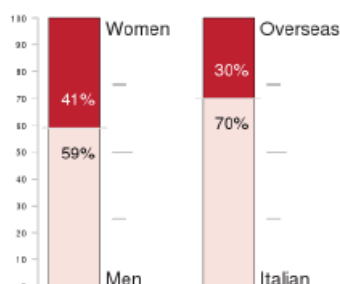


Third level training (PhD Students) is managed by and within the Institutes and it is structured into 10 courses (Table 4).

Table 4 - PhD Students

| Course | Students | | | of whom overseas |
|--|----------|-----|-----|------------------|
| | M | F | Tot | |
| Agrobiodiversity | 14 | 11 | 25 | 19 |
| Agrobiosciences | 13 | 12 | 25 | 3 |
| Biorobotics | 50 | 36 | 86 | 26 |
| Economics | 16 | 10 | 26 | 5 |
| Emerging Digital Technologies | 37 | 6 | 43 | 10 |
| Law | 15 | 8 | 23 | 8 |
| Management | 13 | 14 | 27 | 7 |
| Political Science, European Politics and I. R. | 19 | 9 | 28 | 8 |
| Human Rights and Global Politics | 10 | 15 | 25 | 12 |
| Translational Medicine | 16 | 21 | 37 | 7 |
| School Total | 203 | 142 | 345 | 105 |

Data at 31 December 2018



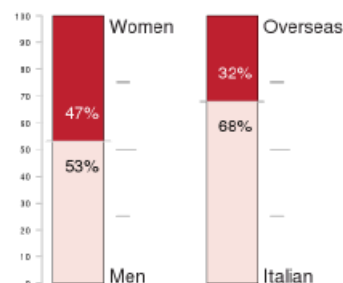
³ ND: Not Available at the moment, for all the document

10 Master's Diplomas courses are also provided, which are held by the Higher Education Unit (Table 5).

Table 5 – Master's Diploma Students

| Course | Students | | | of whom overseas |
|---|-----------|-----------|------------|---------------------|
| | M | F | Tot | |
| Management and control of the Environment | 7 | 8 | 15 | – |
| Innovation in Cardiac Surgery | 7 | 1 | 8 | 6 |
| Theory and practice of vascular access in patients on haemodialysis | 7 | 9 | 16 | – |
| Electoral Policy and Administration | 6 | 3 | 9 | 9 |
| Management Innovation and Services Engineering | 6 | 4 | 10 | – |
| Underwater and hyperbaric medicine | 4 | 7 | 11 | – |
| Human Rights and Conflict Management | 8 | 14 | 22 | 6 |
| Ultrasound and applications in nephrology | 5 | 8 | 13 | – |
| Italian wines and global markets | 9 | 9 | 18 | 2 |
| Photonic Integrated Circuits, Sensors and Networks | 19 | 7 | 26 | 25 |
| School Total | 78 | 70 | 148 | 48 |

Data at 31 December 2018



The Sant'Anna School of Advanced Studies is also member of the AlmaLaurea4 Consortium to monitor the employment opportunities for honours students and PhD students. These surveys provide an additional element regarding the quality of the training provided by the School: in case of Honours Students, the employment rate one year after graduation is 82.1% (national average 55.1%) and three years after graduation is 91.9%; in the case of PhD students, the rate of employment one year after the diploma is 85.9% against a national average of 84%.

Development of the School over the last decade

The Sant'Anna School of Advanced Studies has grown significantly over the last ten years. Having completed the start-up phase of a new university at the end of the 90s, the first twenty years of School life were critical for the purpose of defining its mission and academic and organisational structure.

However, the period between 2009-2019 represented a turning point for the definition of the School as a true **Research University**. The number of scientific publications reported by Scopus doubled in the period between 2008-2018, and important research infrastructures were realised. The School was also ranked first in Italy amongst all schools, holding the first place in Italy out of all universities (THE Ranking).

The School's teaching staff has grown significantly over the last ten years, with the number of teachers/professors doubling, in particular associated professors and type B assistant professor. The number of short-term contract administrative staff and untenured assistant professors (type A) has also significantly increased. Today, Sant'Anna is the largest special-statute school in Italy.

⁴ <http://www.almalaurea.it>

Table 6 – Growth of the teaching and research staff

| Faculty | Depart. | Instit. | Staff at 31/12/2009 | | | | Estimated staff at 31/12/2019 | | | | | New staff net of transfers | | | | Terminations | | | | Growth |
|---------|---------|---------|---------------------|----|---|-----|-------------------------------|----|---|-----------------|-----|----------------------------|----|-----------------|---|--------------|----|-----------------|---|--------|
| | | | FP | AP | R | Tot | FP | AP | R | R _{tt} | Tot | FP | AP | R _{tt} | R | FP | AP | R _{tt} | R | |
| SOC | GIU | DRP | 5 | 4 | 1 | 10 | 5 | 4 | 2 | 2 | 13 | 1 | 2 | 2 | 3 | 3 | 1 | - | 1 | 3 |
| | SCP | DRP | 4 | 3 | - | 7 | 6 | 2 | 2 | 2 | 12 | 1 | 1 | 3 | 2 | 1 | - | 1 | - | 5 |
| | ECO | MNG | 2 | 4 | - | 6 | 6 | 5 | - | 3 | 14 | 1 | 3 | 4 | 1 | 1 | - | - | - | 13 |
| SPE | | BRB | 8 | 3 | - | 11 | 9 | 4 | - | 3 | 16 | - | 3 | 4 | 1 | 2 | - | - | - | 19 |
| | ING | TCP | 2 | 3 | - | 5 | 8 | 5 | - | 2 | 15 | 1 | 4 | 4 | 1 | - | - | - | - | 19 |
| | AGR | LSC | 5 | 5 | - | 10 | 9 | 6 | 1 | 3 | 19 | 1 | 4 | 4 | 4 | 2 | 1 | - | 1 | 2 |
| | MED | LSC | 5 | 4 | 3 | 12 | 6 | 3 | 4 | 1 | 14 | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 2 |
| | | | 3 | 2 | 1 | 6 | 2 | 2 | 2 | 1 | 7 | - | 3 | 1 | 1 | 3 | 1 | - | - | 1 |

FP: Full Professors; AP: Associate Professors; R: Researchers; R_{tt}: Researchers tenure-track

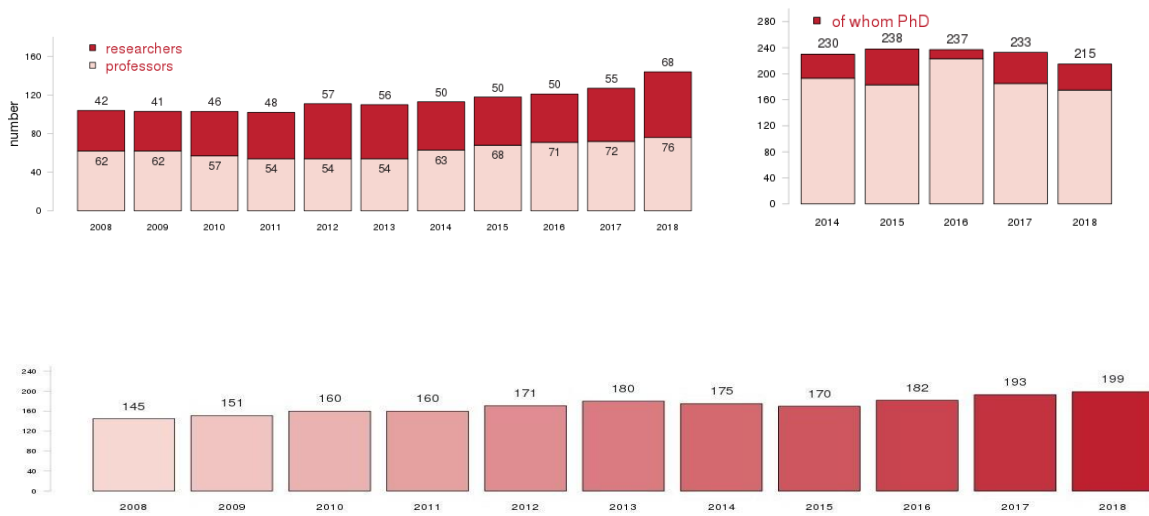


Figure 3 - Growth of the teaching and research staff including also technical and administrative staff

The Federation

The 2016-2018 three-year Programme planned the establishment of a Federation with IUSS (The University School for Advanced Studies) of Pavia and the Scuola Normale Superiore (SNS) of Pisa. The Federation was established in 2018 and it is now in the experimental stage. Today, the Federation is made up of a joint Board of Directors and a single Assessment Body. At the end of 2021, the Senates of the three universities will express their opinions regarding the validity of this organisational structure that is pursuing the following general objectives:

nationally, to strengthen the collaboration between the three institutions in order to improve, both individually and collectively, the already high-performance levels due to the integration and sharing of human resources and research infrastructures;

internationally, the establishment of a critical mass capable of offering, structuring and handling complex activities, thus increasing the visibility and the appeal of the system of Schools, even beyond Italian borders.

With regard to the initiatives implemented to date and planned for the next three years within the Federation, please refer to the document "Federation Strategic Plan".

Our mission today and tomorrow

The Statute defines the Sant'Anna School of Advanced Studies as a public university institution with special status whose purpose is to promote the development of culture and scientific/technological research, nationally and internationally. From the date of its establishment, the School has distinguished itself as a **learning community** featured by strong shared values.

The privileged ratio between teaching staff and students, a strong orientation towards research, interdisciplinarity, a system of national and international relations and the expertise and the support skills of technical and administrative staff are all distinguishing factors that have enabled the School to grow both in terms of size and results.

Having established the School as an institute of not only national but international relevance in the academic and scientific panorama, the School wishes to address the next six years reflecting on its mission and evolution over time, in line with challenges presented by the cultural, social, technological and scientific context.

In agreement with its Statute and by focusing on how it can make this skillset available to the community, in response to increasingly challenging problems, **the School's mission is that of serving as a benchmark and quality public institution, attracting talents which are nurtured and educated, in order to take care of the world and to responsibly contribute to its cultural growth and sustainability, in accordance with constitutional values.**

A research university, a school of talent, for a more sustainable and inclusive world

this will be our motto for the next six years, considering that **merit based on quality skills and commitment represents the true driver of development**, the principal mechanism of social mobility, and the resource that we must implement in order to address the challenges of sustainability and justice that the world is currently facing.

Strategic themes for the future of the world - such as climate change, environmental sustainability, justice and social inclusion, new procedures for international relations, health and connected technologies, big data and the impact on economic systems and technologies - are areas in which the School wishes to invest its talent, at all levels and in all its parts, over the next six years. As a public university institution required to create value for the community, through research, education and the third mission, the School wishes to leave a signature and to make a difference for future generations, and it wishes to work for attaining culture and scientific development and contributing to build the common good.

Complex problems will increasingly require global responses, identified by working with the best Italian and foreign partners. In this regard, internationalisation will not represent an activity to be pursued *per se*, but a useful and indispensable tool for the full advancement of the School in its local and global context. The School could present an organised **THINK TANK**, capable of providing concrete solutions and various perspectives (ethical, economic, legal, technological, scientific) on certain key matters for our country and the world.

We propose making this journey in Federation with the IUSS and the SNS and, in particular, to open a new season of collaboration with the SNS that – as Sant'Anna - promotes the entire system of research and education in Pisa. Pisa can become a centre that appeals to and nurtures the national and international talented students.

Pisa can offer the ideal context for the implementation of this strategy and the School can take on the role of promoter. The Sant'Anna School has always benefited from the spirit of initiative of its **teaching staff, research fellows, students and technical and administrative staff, who have always interpreted their activities proactively. In the future, the School intends to encourage attitudes of strong resourcefulness and innovative approaches by encouraging experimentation and providing the environmental conditions to support this.**

The implementation of our mission will be achieved by further strengthening the collaboration with the University of Pisa, a key partner for the School, with whom it already collaborates in the training of undergraduates, and with the Monasterio Foundation for clinical training. The School will also act in strong synergy with other Tuscan universities, with the Istituto Universitario Europeo (European University Institute) in Florence and with all those parties that contribute to research and training in Pisa and Tuscany, such as the CNR (National Research Council), the University Hospital of Pisa, IMT of Lucca (School for Advanced Studies) and the Region of Tuscany.

The following paragraphs will present the strategic objectives for each area of our mission: **research, training and the third mission of higher education**. For producing the desired results at the best, a solid organisational and logistical structure is required, as well as good financial sustainability. This document is therefore organised into a first section dedicated to strategic objectives, and a second section dedicated to the conditions of the logistic and financial organisation that we intend to guarantee achieving Sant'Anna goals.

The strategic goals

Research

Research has been the core activity of our School, particularly over the past ten years: “we are and we want to be a research university because we believe that the innovation and change required by our world is based on research”. Research, both in the field of social sciences and of experimental science, is the training ground in which we can provide instruction for students with significant talent and the stimulus for the third mission of higher education, whereby we can make a difference in the context where we operate.

Research targets for the next few years include the following.

Research goal 1

Maintain high volumes of scientific production but above all increase the quality of production, which can be verified in consideration of the specific criteria for the sector, type of journal, number of citations received by publications and impact in terms of the third mission of higher education, for both social and experimental sciences.

Our target is certainly maintaining and, if possible, increasing our high position in international rankings, specifically thanks to consolidation in areas of existing research. At the same time our target is to deal with the risk of exploring new areas, even if they may initially appear to be poorly productive in terms of “publications”, where they can truly cause an impact and we can nurture new projects.

The School has always had a significant ability to attract funding from open calls and third-party projects. It is important to maintain, and if possible to increase, this ability in the years to come, above all by supporting the teaching staff and the research fellows in the planning stage.

Declination of the goals in the next three years

- Responsible professors: Arianna Menciassi (vice-rector) and the Institute Directors
- Offices involved: Planning, Control and Research Unit;

Description of objectives and related actions

With regard to the ability to attract financing for projects with tenders and third parties, a Grant Office will be set up at the central level to be the point of reference in the exchange of information and in the preparation of proposals and forms, especially for projects financed by the European Commission.

The revenues from research resulting from the financial statements in the last three years have exceeded 18 million euros and the School aims to maintain and/or improve the 2016-2018 average, which is already significant.

Resources for implementation

The Grant Office will be set up through a reorganization and/or the strengthening of the technical-administrative staff.

| Indicator | History | | | | Goal | | | Notes |
|--|---------|--------|--------|------|--------------------|-----------|-----------|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Number of Scopus products (with SSSA affiliation)/Faculty | 682 | 746 | 799 | nd | >= 740 (triennium) | | | = triennium average (740) |
| of which in the first quartile of Scimago JR (%) | 52,3 | 53 | 60,3 | nd | >= 55,2% | >= 55,2% | >= 55,2% | = triennium average (55,2%) |
| Number of articles in Band A (%) | 32,14 | 33,46 | 36,44 | nd | 40 (triennio) | | | 2016-2018 three-year average increase (34.01%) to 40 in the 2020-2022 three-year average. Progressive growth over the three-year period is assumed. |
| Proventi della Ricerca (keuro) | 18.954 | 18.245 | 18.162 | nd | >= 18.454 | >= 18.454 | >= 18.454 | = triennium average (18.454) |
| Percentage of co-funding with research funds for Research Grants | 77,1 | 87,85 | 83,32 | nd | 85 (triennio) | | | 2016-2018 three-year average increase (82.76%) to 85 in the 2020-2022 three-year average, with possible fluctuations in individual years. |
| Number of active research projects from competitive procedures | 211 | 234 | 307 | nd | 275 (triennio) | | | 2016-2018 three-year average increase (250) to 275 in the 2020-2022 three-year average, with possible fluctuations in individual years. |

Research goal 2

Facilitate interdisciplinarity and the possibility of collaboration between institutes and research areas.

Research activities addressed by the School are multiple and variegated. The organic development of these activities is often desirable, but it is important to aspire to targeted, consistent and balanced growth. International exchange and collaboration activities could obtain significant drivers from a more precise and effective thematic organisation, irrespective of the positioning of teaching staff within the various institutes. Firstly, this thematic presentation could assist in both the management of interconnected activities and in communication, for the purpose of the presentation to external stakeholders of activities by the School, of its ambitions and of results achieved. From this point of view the central communication office can support the Institutes to improve the promotion of their research areas and the interdisciplinary research areas, above all in an international framework.

The organization climate survey emphasises that the institutes experience some difficulties in facilitating collaboration between themselves and between their various internal areas, and that information communication and exchange processes are still considered to be inadequate. The commencement of cross-activities, where research fellows and the teaching staff of various institutes can work alongside each other, will improve the sharing processes.

The number of projects submitted and acquired by each Institute which also envisage the collaboration of teaching staff from other Institutes will be monitored.

Today, the School has already identified macro cross-cutting themes on which various Institutes are working jointly, and where the School intends to intensify and stimulate research, namely:

- climate change and environmental sustainability of the policies, including the effects in the social, economic, agricultural and industrial spheres;
- studying the policies and actions to be taken for evolving social context in which we live, characterised by an ageing population and with greater inclusion and fairness issues, where technological innovation and research in the clinical, legal, social and organisational field can play a crucial role to ensure the health and quality of life of people;
- technological development and the implementation of methods to use Big Data in the social and industrial context.

The joint planning and the acquisition of interdisciplinary projects can be the subject of specific incentives, in line with the availability of funds dedicated to this aspect and following the approval by the Board of Governors.

The significant growth in the number of teaching staff and research fellows over the past years indicates that further increases or the establishment of completely new research areas in the short term are unlikely, without a substantial increase in government funds. However, we believe that the themes mentioned above are inescapable in relation to the open needs and demands which the world in which we live must address, and which are also part of DNA of the School and the focus of interdisciplinary development, both within the School and in partnership with the Federation with SNS and IUSS and with other Italian and foreign institutes.

Research goal 3

Guarantee excellence in the process for the recruitment of new teaching staff and research fellows

The quality of scientific production by a university is the direct expression of the talent and creativity of persons engaged in research. Therefore, growth for Sant'Anna and its prestige and credibility in the international academic world strongly depend on the quality of recruitment of new teaching staff and research fellows.

The Institutes will continue to carry out their strong proactive action, since they are structures which are oriented towards research and second and third level teaching. Consequently, the fundamental role of the Institutes will be maintained in the recruitment process of new teaching staff with a high-tech scientific profile and an aptitude for teaching in a context such as that to be found in the School that wants to use research as an educational tool. The School has very talented young people in training who

represent human potential of great value. However, the most effective actions to maintain a balance between the recruitment of in-house human resources and high-quality acquisitions from outside the School will need to be identified. Therefore, the School will need continue to ensure the widest possible visibility and guarantee the utmost transparency regarding its recruitment procedures, by endeavouring to attract candidates of international value and equip itself with the means necessary to identify the talents which can contribute effectively to the School's growth.

Declination of the goals in the next three years

- Offices involved: Planning, Control and Research Unit.

Description of objectives and related actions

Maintaining a balance between the recruitment of internally grown human resources and high-quality recruitment from the outside. Keeping the quality of the recruitment process of new teaching and administrative staff very high.

Resources for implementation

The resources remain within the budget for the specific function and, if necessary, a redefinition of the expenditure will be made. The search for private supporters/financiers interested in the activation of specific academic positions will be more aggressive.

| Indicator | History | | | | Goal | | | Notes |
|-------------------------------------|---------|------|------|------|----------------|------|------|--|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Field Weighted Citation Impact | 1,60 | 1,57 | 2,09 | nd | 2,5 (triennio) | | | 2016-2018 three-year average increase (1.75) to 2.5 in the 2020-2022 three-year average. Progressive growth over the three-year period is assumed. |
| Ranking compared to domestic equals | 3,35 | 3,01 | 3,85 | nd | 3,8 (triennio) | | | 2016-2018 three-year average increase (3.40) to 3.8 in the 2020-2022 three-year average. Progressive growth over the three-year period is assumed. |

The Institutes' Research goals

The BioRobotics Institute

BioRobotics is a scientific-technological area which merges robotics and biomedical engineering; in particular it is the science and the technology of the design and development of bioinspired robotics systems with biomedical application. While maintaining a unique vision on this topic, the research at the BioRobotics Institute is articulated in the following themes: 1) Medical Robotics and Regenerative Medicine, 2) Wearable and Collaborative Robotics, 3) Neuroscience Robotics, 4) Prostheses and Artificial Organs, 5) Bioinspired and Soft Robotics, 6) Mathematical and Computational Modeling. Such themes are horizontal with respect to the different research groups that work in the Institute (formally called "Areas" and "Laboratories"), which are led (PI) by Faculty members.

The primary objectives of the Institute's Research agenda for the 2020-2022 term, in accordance to the strategic orientation plan of the School (*piano strategico di Ateneo*) are:

- To strengthen the quantity and increase the quality of the scientific production, as measured by papers on reputable journals in the field (indexed on Scopus/WOS), on Nature and Science families' emerging journals, or on journals with relatively high Impact Factor (IF>5), considering the engineering field.
- To improve the impact locally and globally, as measured by the acquisition of grants with roles of high visibility for the Institute, like the ERC grants (Starting, Consolidator and Advanced), or being the Coordinator in European/international grants, being invited as guest speaker in universities, international research centres, conferences and schools relevant for the field, receiving awards and prizes from the community, having editorial appointments, etc.
- To strengthen the technology transfer actions, related to the spin-off companies and the

industrial contracts in the biorobotics domain, and sustaining the activities of the Competence Center ARTES 4.0.

To this aim, the Institute will continue promoting intra-institute and extra-institute research projects and initiatives, also by allocating a portion of the resources to: co-fund the acquisition of research instrumentation, activate mini-grants for the younger researchers, support (incoming) Visiting programs.

The Institute of Law, Politics and Development (DirPoliS)

(Institute of Law, Politics and Development)

The following part deals with the actions undertaken by the DirPoliS Institute with regard to the specific objectives defined in the School's Strategic Orientation plan.

Research Goal 1 - To maintain high volumes of scientific production, but above all to increase the quality of production, which can be verified, considering the specific criteria of the type of disciplinary sector, based on magazines, the number of citations received by the publications and the impact in terms of third mission, both for social and experimental sciences.

In the DirPoliS three-years plan, specific attention is devoted to the quantitative aspect of research. It is defined according to the score grids (PPSE) and with regard to the average of the last years. Its increase should be in line with the primary objective of improving the qualitative level of works.

In detail, the objectives have been specified as follows (the threshold to be reached for the purpose of the recognition of the total amount of the University funds is 7 PPSE for professors and 3,5 for researchers, to be calculated according to the average of the last three years):

- For each professor (full or associate), the objective is to reach at least 25,5 PPSE in the three-year period (with an average of 8,5 per year); for each assistant professor (permanent or in tenure-type B), 12 PPSE, in the three-year period (with an average of 4 PPSE per year). As regards to untenured-type A assistant professor, at least 3 PPSE are required and a publication in the three years in a Journal indexed by Scopus or ranked A (ANVUR categories); alternatively, a monography. As for research assistants, at least 1,5 points per year.
- Everyone has to publish, in the three-year period, at least three products among the following: articles on Journals Scopus indexed, articles on Journals ranked A, monography. If relevant for the sector, qualitative criteria concerning the number of citations for each publication will be taken into account too.

The attention on the editorial positioning of the scientific products is due to the need for considering the relevance of indexed publications for the ranking of the School. As long as it is possible to do so, the Institute requires such an effort.

Another quantitative aspect that the Institute takes into account is represented by the amount of co-funding to research. For this purpose, the objectives are the following:

- improve the performance of the area in relation to competitive tenders at the rate of at least 2 projects more than what was acquired in the previous three years;
- improve the ability of the area to get funds for institutional researches and for orders commissioned by third parties/contracts for third parties, and increasing the corresponding rate of 10% with respect to the previous three years.

Research goal 2 - Facilitate interdisciplinarity and the possibility of collaboration between institutes and research areas.

Professors of the Institute regularly cooperate with the other Institutes, mainly in the areas of AI, big data (TeCIP Institute), economic crime (Institute of Economics), environment, health legal aspects (Institute of Life Sciences).

DirPoliS has identified through the Strategic Project an interdisciplinary main topic ("Governance for Inclusive Societies") that can involve all the Institutes of the School.

Formally, DirPoliS pointed out, among the other objectives identified at point 1, the following objective:

"developing cooperative activities: a) among different areas of the Institute; b) with other areas, external

to the Institute, favouring the subjects of the pillars of the DirPoliS strategic plan (thus, in order to support at the scientific level, the educational activities planned as implementation of this project).”

Research Goal 3 - Guarantee excellence in the process for the recruitment of new teaching staff and research fellows

The Institute formulated the overall policy objective of ensuring a minimum of external recruiting; at the same time, reducing significantly the percentage of career progression (approximately 65% vs 35%).

The Institute of Economics

This section will provide an outline of the strategies that the Institute of Economics aims to pursue in the next three years, on the basis of the strategic goals of the Strategic Orientation Plan of the School.

Research Goal 1 - To maintain high volumes of scientific production, but above all to increase the quality of production, which can be verified, considering the specific criteria of the type of disciplinary sector, based on magazines, the number of citations received by the publications and the impact in terms of third mission, both for social and experimental sciences.

In the next three years the Institute of Economics will try to further improve its publication performance in its three core research fields: i) complexity economics, ii) the dynamics of markets and industries, iii) technical change, innovation and economic history. In this endeavour, we expect that the resources (in terms of recruitment, data-sets and IT infrastructure) that the Institute has obtained by means of the department of excellence Embeds will provide a very important contribution to the growth of the research performance of the Institute, both at national and international level.

Concerning publications, the strategy of the Institute is to focus on the quality and impact of publications, rather than on quantity. In particular, we will concentrate our efforts on journals in the top quartile SCIMAGO and/or in top-field journals in international rankings. We expect that this focus on the quality of the publications will contribute to enhance the position of the School in international rankings, especially in terms of citations.

Concerning research grants, we aim to further develop the ability of the Institute of getting external research funding. In this case, the strategy of the Institute will be to focus on grants of major national and international Institutions (e.g., PRIN, European projects) with higher visibility and impact.

Research goal 2 - Facilitate interdisciplinarity and the possibility of collaboration between institutes and research areas.

Three years ago, the School's International Advisory Board noted the limited cooperation between the Institute of Economics and the other Institutes of the School on research activities. Since then, we have made significant progresses. In the last two years, the researchers of the Institutes have started several research collaborations with the other Institutes. The most notable examples are the collaboration with DirPoliS on intellectual property rights (which resulted in an H2020 grant) and on predictive jurisprudence; the cooperation with the Institute of Management in the Department of Excellence Embeds; several ongoing projects with the Institute of Life Sciences on the issues of climate change and sustainable development; the cooperation with the Institutes of BioRobotics and TeCIP in the ARTES Centre of Competence.

We plan to foster these collaborations further, by organizing joint seminars and workshops with the aim to further stimulate the complementarities between the research profiles of the Institute. We are going to devote specific efforts to enhance the impact of publications and research grants emerging for multidisciplinary collaborations.

Research Goal 3 - Guarantee excellence in the process for the recruitment of new teaching staff and research fellows

The recruitment policies adopted by the Institute in the last three years have achieved very good results

in terms of research performance, training activities and ability of getting external research funds. This result was achieved thanks to a careful screening and evaluation process which ensured that the newly-recruited integrated successfully and quickly into the Institute's research lines. We intend to pursue this strategic line also in the near future.

The Institute of Management (IdM)

Below, in relation to the individual objectives defined in the Strategic Orientation Plan, the objectives of the Institute of Management and some possible actions to achieve them are specified.

The Institute of Management (also called IdM) carries out research, training and "third mission" activities in three main areas: innovation, sustainability and health. IdM's objective is to contribute to the advancement of scientific knowledge at an international level and to the competitiveness of the country system, with particular attention to the dynamics of social inclusion and management of the common good, both nationally and globally.

Particular attention has been paid over the last three years - and even more in the next three - to the creation of positive impact on society, seeking ever greater connections between research, training and third mission activities.

Research Goal 1 - To maintain high volumes of scientific production, but above all to increase the quality of production, which can be verified, considering the specific criteria of the type of disciplinary sector, based on magazines, the number of citations received by the publications and the impact in terms of third mission, both for social and experimental sciences.

In recent years the research activity of the IdM has clearly grown in terms of quantity and quality. We believe that the number and quality of scientific publications, as well as the number and size of ongoing research projects is such as to be able to hypothesize increases of the order of 20% on a three-year basis.

In particular, the number of international projects in which IdM is involved is especially high, both in relation to the number of faculty members and the number of administrative staffs. It should be noted that there are collaborations, both at national and international level, both with companies and with universities or institutions, which over the years have been consolidated, generating new research results and training activities, with a relevant positive social impact.

It is therefore our intention, over the next three years, to further consolidate these dynamics, possibly further innovating them, and pursuing the following trends to the extent of 20%:

- increase in the number of published articles (absolute value)
- increase in the number of published/edited books (absolute value)
- increase the percentage of articles published in class A scientific journals
- increase the percentage of articles published with co-authors from other universities, both Italian and, above all, foreign
- increase the number of average citations of published articles
- increase the number of European projects
- increase the volume of research funding obtained both through competitive calls and third-party contracts
- increase the number of PhD scholarships funded by third parties

Research goal 2 - Facilitate interdisciplinarity and the possibility of collaboration between institutes and research areas.

IdM has a consolidated tradition of interdisciplinarity and collaboration with the other Institutes of the School. Furthermore, internally, IdM has started a process of increase in research projects and scientific publications that involve researchers from more than one of its areas. With regards to collaborations with the other Institutes, IdM currently has projects of collaboration in research and/or training activities with all the other Institutes of the School. This is a consolidated characteristic that IdM has been strengthening over the years and which concerns its three areas. In the 2020-2022 period, in addition to continuing this

collaboration trend, particular attention will be paid to the Embeds Department of Excellence project which is leading to an intensification of the collaboration with the Institute of Economics and with research groups of the University of Pisa active in the field of Data Science. Furthermore, IdM will continue to be active in the Climate Change project and will continue to collaborate with research groups from IUSS Pavia, SNS and IMT Lucca as it is already doing.

Research Goal 3 - Guarantee excellence in the process for the recruitment of new teaching staff and research fellows

Over the past three years, researchers and professors who have joined the IdM have certainly achieved what was expected from them in relation to research, training and third mission activities. These are people recruited with a balance in mind between researchers who have spent part of their previous career at IdM and people coming from outside, as well as in terms of gender. In the next three years, a strategy of strengthening the workforce will be pursued by adopting criteria similar to those that have given good results in the previous three years. Hopefully, also, positions will be opened for researchers (junior) who will work across the three areas. If possible, attention will also be paid to the possibility of recruiting experienced professionals from abroad for the strengthening of IdM's three areas and/or for innovative and transversal activities.

The Institute of Life Sciences (ISV)

The Institute of Life Sciences (called ISV) is focused on research topics in Agricultural Sciences, Biotechnology and Medical Sciences, with the shared vision of contributing to the improvement of the quality of life. In ISV the researchers are studying new cultivation strategies with low ecological impact, healthier and nutraceuticals enriched foods, plant varieties resistant to climatic stress factors, new drugs and therapies with limited side effects on the patient.

Research Goal 1 - To maintain high volumes of scientific production, but above all to increase the quality of production, which can be verified, considering the specific criteria of the type of disciplinary sector, based on magazines, the number of citations received by the publications and the impact in terms of third mission, both for social and experimental sciences.

The ISV goal is to increase its position in the best world universities ranking for Life Sciences (ranked 101-125 according to the Times Higher Education 2020) and for Clinical, Pre-Clinical & Health (ranked 301-400 according to the Times Higher Education 2020). New scientific areas will be addressed, if possible, but without compromising the high standards of scientific productivity that the ISV has achieved until now. The ability to attract projects supported by Institutional calls and private companies is already significant in ISV. In the next years the institute will try to increase this capacity by stimulating ISV's researchers to submit projects. In this regard, the international dimension of the project and the collaboration with other Institutes of the School will be advisable.

Research goal 2 - Facilitate interdisciplinarity and the possibility of collaboration between institutes and research areas.

The ISV has a considerable complexity of research activities. The organic development of these activities is still ongoing. In the recent past the ISV has invested heavily in the growth of the Area of Medicine and, more recently, the institute has supported the first research centre on climate change. In the coming years it will be essential to guarantee a coherent and balanced growth of the different and still existing research areas of the ISV. The main objective will be to encourage joint research activities within the ISV, the acquisition of interdisciplinary projects also in collaboration with other Institutes of the School.

Research Goal 3 - Guarantee excellence in the process for the recruitment of new teaching staff and research fellows.

The quality of the ISV's scientific production is proven by the results on national and international rankings. The scientific credibility of ISV's researchers in the national and international academy is a fact. In terms of quality of recruitment of new professors and researchers, the ISV has always followed the

most rigorous international evaluation criteria. The ISV has highly talented young people in training who represent a human potential of great value; however, we will continue to give the greatest visibility and absolute transparency to recruitment procedures, attracting candidates of undisputed international value.

The Institute of Communication, Information and Perception Technologies (TeCIP)

The research activities of the TeCIP Institute (Institute of Communication, Information and Perception Technologies) are related to the following areas:

- Telecommunication networks, optical systems and devices, and integrated photonic circuits;
- Advanced man-machine and haptic interfaces, telerobotics, wearable and collaborative robotics, augmented/virtual reality systems, advanced kinematics and intelligent machine design, optomechatronics;
- Operating system mechanisms and methodologies to increase the reliability, predictability, efficiency and security of software in embedded, distributed, heterogeneous real-time systems and cloud computing infrastructures;
- Artificial intelligence, digital perception systems, and big-data analytics for robotics, complex industrial systems and autonomous systems.

The primary objectives of the Institute's research for the 2020-2022 three-year period, in line with the University's strategic plan, are:

- Increase the quality of the scientific production, measured through publications in first quality international journals (indexed by Scopus/WOS) in the areas listed above.
- Increase the impact of the Institute's research on the national and international territory, measured through the projects founded by the European community and by National institutions, the ERC calls (starting, consolidator and advanced), the citations received in the publications, the awards and acknowledgments from the reference scientific community, including keynote speeches, organization and participation in program committees of conferences and editorial boards of international journals.
- Consolidate technology transfer related to spin-offs and industrial contracts in domains as telecommunications, robotics, embedded systems, and artificial intelligence.

The Institute intends to continue to promote projects that stimulate collaboration between the various research groups present within it and also between the various institutes of the School. To this end, a portion of the institute's resources will be used to co-found the acquisition of research equipment to renew the research infrastructures, activate mini-grants for younger researchers, foster collaboration with international research centers, and organize seminars with world-class experts. Finally, the Institute will adopt reward mechanisms for teachers/researchers who will contribute to achieving these goals.

Finally, the TeCIP Institute intends to continue pursuing the teaching activities for the students of the School, proposing at least one new Master's Degree (also participating in competitive calls) in the disciplines of interest to the Institute.

Training

In the context of training activities, the Sant'Anna School intends to nurture the cornerstones of its mission and of its nature as a public special-statute university, by revising and increasing the training offer, over the next six years.

The premises on which the plan for the reorganisation of training activities is based are the following:

- The challenge for the School has always been to reach the excellence; the School must be capable of nurturing talented students as a driver of development, aspiring to be an advanced research and cultural development centre, capable of appealing to talent, facilitating social mobility and, as a public institution, carrying out its role in favour of the community;
- Starting from its top international ranking, specifically in relation to the quality of its research, **the School aims to be a national benchmark centre for excellence**, capable of nurturing and attracting the best students, at national level and internationally, also offering opportunities for exchanges with international centres of excellence;
- **The training ground for students is the research** conducted at the School. On this training ground, teaching staff undertake to instruct young students at various levels in areas at the frontier of knowledge, using a rigorous approach in terms of method and level of analysis, in order to develop students' skills and build up their expertise;
- In consideration of the specific nature of the School and of the above statement, the School **favours a supplementary training, which is not in competition with generalist universities**. The School aims to be a favoured partner of these universities, and in particular the University of Pisa, in order to foster talented students, offering courses that strengthen their inter-disciplinary skills and knowledge in the areas of applied research of social and experimental sciences.

On the basis of these strategic premises, the training review plan includes the reformulation of and an expansion in the scope of training that contributes to the School's mission. The organization climate survey highlights different opinions within the teaching staff regarding how the School's structure could be improved with regard to the current division of the management of educational activities between faculties and institutes. In the next year, the School aims to carry out an in-depth appraisal in relation to this issue in order to identify better solutions which ensure the educational coordination among the various training activities, while at the same time maintaining synergy and consistency with the research activities.

In the light of the above, we believe that it is of fundamental importance to **consider training as a continuum**, or rather a collection of interventions that target students throughout their education, which commences in the final phase of their high school education by way of orientation activities. We offer supplementary university training with courses dedicated to Honours and visiting students and/or those taking master's diplomas or master's degrees, and we continue with post-university training with our PhD courses and Higher Education.

The following diagram contains a map of training that the School intends to provide and improve over the next 6 years.

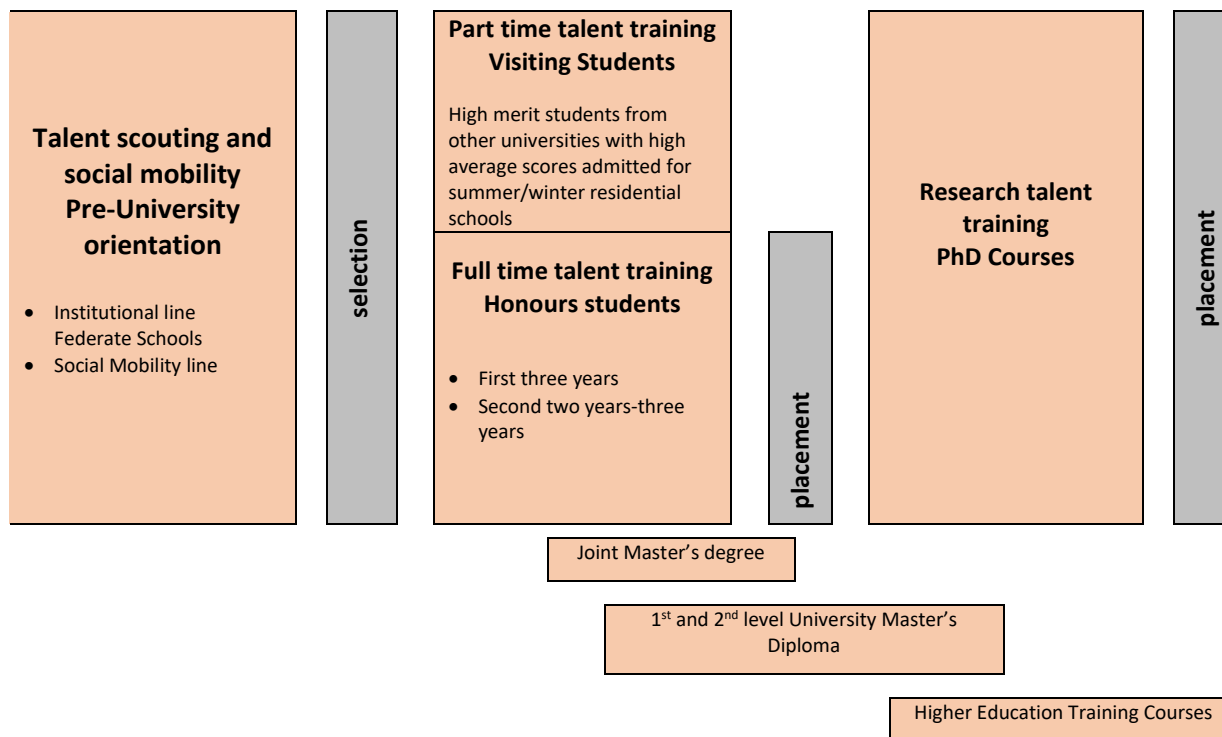


Figure 4 - Map of the school's educational offer

In order to meet the training needs of all types of users, we believe that a significant investment is essential for the purpose of **innovating teaching methods**, above all to facilitate distance learning in certain types of training actions dedicated to visiting students. An example of success in this area, which could provide inspiration for analogous initiatives, is the Simulab centre for the training of future medical doctors and health professionals.

The measures to improve the teaching methods and the dissemination of best practices will be the object of attention for the School in the next few years. Training programmes will be organized for young researchers to improve their teaching abilities and funding will be foreseen for technological innovation, particularly for distance learning. The source of this funding may be the part time talent training initiatives described in subsection 4 of this paragraph.

The School considers the quality of teaching to be a priority objective and will include its systematic assessment in the University's programming and control system.

The actions that we intend to carry on for each phase are described in the following paragraphs.

Training Goal 1

Talent scouting and social mobility: pre-university orientation

University orientation represents one of the institutional prerogatives of Schools of Advanced Studies and for Sant'Anna it constitutes the first part of the activated training programmes. Orientation in fact plays a dual strategic function: it is intended to enable the dissemination and affirmation of outstanding public training based on the valorisation of merit and personal talents and, at the same time, the identification of a greater number of deserving students who can be steered towards adequate and competitive training in terms of international standards.

During the next 6 years we intend to increase the central role played by orientation in the training mission of the School, by including the programme of activities into an organic and structured system of interventions. This programme will form an integral part of the teaching staff's training activities and may contribute to fulfilling their teaching obligations, within the limits decided by the University.

With regard to interventions, we will continue to update our programmes with the aim of providing students of higher education institutions with various content, instruments and support, so that they can

choose their university through participation in university lessons, educational laboratories and informative orientation, specifically focusing on preparation for admittance exams. We will further improve the participative element of activities, promoting discussions and an exchange of opinions and experience between students, using university lectures structured as round tables and linked to current themes, so as to emphasise the frontiers of university research, the interdisciplinarity of knowledge and disciplines and their strong connection to current-day themes or problems. Alongside the above, we will provide a structured programme of peer-to-peer interventions offered to students at the School.

We also intend to further develop the residential nature of orientation, which constitutes another distinctive feature of the orientation model of this School and of Schools of Advanced Studies in general, introducing simplified formulas as compared to the traditional University Orientation, which lasts for one week and is provided in the context of the Federation. We intend to design shorter programmes involving a full immersion experience in the atmosphere of the Sant'Anna campus, so as to emphasise the opportunities of research activity by visits to laboratories and the involvement of participants in practical simulations.

The **Orientation Project** will be enriched by a further systematic intervention specifically dedicated to tackling difficulties in accessing university studies for young talents originating from disadvantaged socio-economic backgrounds.

Following experiments conducted with the **Social Mobility and Merit project** (MSeM), the School intends to continue with this activity that provided significant results, demonstrating that by way of an orientation and mentoring programme, it is possible to break-down socio-cultural, economic and personal barriers that prevent all talents from being offered equal opportunities of accessing university training. The first edition of the **ME.MO Project** (i.e. Mobility and Merit Project) for the valorisation of merit and social mobility will commence in 2019/20. The programme, which is annual, will accompany 120 students in the IV year of their high school in their choice of university and was funded by the Ministry of Education, using resources from the fund for extraordinary interventions for the 2017 FFO (ordinary funding of universities). At present, negotiations are in process with the Ministry for the purpose of recommencing the collaboration realised in the context of the MSeM Project and entering into a new memorandum of understanding for the implementation of new activities commencing from the 2020/21 academic year.

At the same time, the School is committed to raising new funds through our fundraising campaign "Adopt a talent", which includes a specific activity dedicated to orientation activities for nurturing merit and social mobility.

In summary, starting with the permanent links that the School has with 2000 Italian High Schools and their Heads of School, Sant'Anna wishes to activate a process for the systematic flagging of significant talented students and in particular it intends to intercept high merit originating from fragile family backgrounds. Over the next six years the School wishes to offer those talented students a range of actions capable of meeting their various requirements including:

- themed orientation days for the presentation of training programmes in various disciplinary areas,
- open days with campus visits and presentations of entrance exams for undergraduate courses,
- the preparation of webinars, including a presentation of the School and its areas of research to foster the interest of secondary school students in the Sant'Anna School and University choice in general,
- the university orientation school, which offers a select group of students in the IV year of their high school a one-week residential course,
- an expansion of the MeMo project, with the aim of contributing to reducing the Italian gap in access to university, compared to the European average.

Orientation activities over the last 5 years have involved an average of 200-300 students per year. These are significant numbers, but are not proportionate to the potential that the school can provide. A reorganisation of the management of student rooms and an expansion of the School premises will be essential for the purpose of ensuring that orientation becomes one of the training missions of the School and of achieving a **significant increase over the next six years with widespread geographic coverage of Italy**. Funding this action will be linked to government funds which are specifically dedicated or to resources collected in the School's fundraising activities through the "Adopt a talent" campaign that was initiated in the summer of 2019.

Declination of the goals for the next three years: pre-university orientation

- Responsible professor: Gaetana Morgante
- Offices involved: Strategic Projects Unit

Description of objectives and related actions

The objectives that the School sets for the next three years, through the initiatives described above, are the following:

- strengthen the centrality of orientation in the educational mission of the School through a structured program of interventions; this program will be an integral part of the teaching staff's training activity and may contribute, within the limits decided by the Faculties, to the fulfillment of their teaching obligations;
- increase the number of oriented students by 50 units each year.

Resources for implementation

Institutional activities are supported with resources budgeted for orientation equivalent to € 134,500 for each of the years from 2020 to 2022. the School is committed to raising new funds through a fundraising campaign.

| Indicator | History | | | | Goal | | | Notes |
|-------------------------------|---------|------|------|------|------|------|------|-------|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Number of orientated students | nd | nd | nd | 550 | 600 | 650 | 700 | |

Declination of the goals for the next three years: ME.MO project

- Responsible professor: Gaetana Morgante
- Offices involved: Strategic Projects Unit

Description of objectives and related actions

The "ME.MO Project for the valorisation of merit and social mobility" is a further line of intervention dedicated to contrasting the difficulties of access to university studies by talented young people from disadvantaged socio-economic backgrounds.

The first edition of the ME.MO starts with the academic year 2019/20. The one-year path will accompany 120 fourth year high school students, selected for merit and fragile socio-economic background, to the university choice.

Resources for implementation

The first edition of the ME.MO project was financed by the Minister of Education (MIUR) with resources from the fund for extraordinary interventions in the 2017. A protocol of understanding is being prepared to be signed with the MIUR Student Directorate General for the implementation of orientation programs aimed at promoting merit and social mobility in areas of educational weakness.

At the same time, we are committed to raising new funds through the "Adopt the talent" fundraising campaign, which includes a specific line dedicated to orientation initiatives for the enhancement of merit and social mobility.

| Indicator | History | | | | Goal | | | Notes |
|---|---------|------|------|------|------|------|------|-------|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Number of orientated students – social mobility ME.MO | nd | nd | nd | 0 | 120 | 120 | 120 | |
| Funding raised for orientation (thousands of euro) | nd | nd | nd | 0 | 150 | 160 | 175 | |

Training Goal 2

The selection of students: review of the entry exam

Over the past years, the process for the selection of honours students has presented a series of critical aspects. To date it has been structured with a pre-selection phase based on admission tests conducted in various Italian centres, outsourced to a company, and a further phase within the School, based on written and oral exams.

In the future, from the next academic year, the School will be part of the Cisia Consortium (University Information Systems Interuniversity Consortium), substantially modifying the pre-selection phase.

Cisia is a consortium which includes 49 Italian State Universities (including Polimi and UNIPI), which operates as an in-house provider.

In 2018, over 140,000 tests were carried out during 90 sessions throughout Italy in 60 centres for TOLC-I and 40 for TOLC-E1 (Cisia tests).

By way of membership of this consortium, Sant'Anna School could implement a particularly high admission threshold and could therefore consider all students that achieve that result in any test centre. Moreover, the Online Test of Cisia can be included in the orientation programme. It would be possible to organise trial sessions at the School (membership of the consortium in fact involves each university being prepared to host test sessions) together with orientation activities such as themed orientation days and the Summer Orientation School.

Declination of the goals for the next three years

- Responsible professors: Deans of the two Classes
- Offices involved: People and Organization Area - Student Office

Description of objectives and related actions

The School has the objective of increasing the average of the applications per position of honour student in the three-year period 2020-2022 compared to that 2016-2018.

Resources for implementation

Membership to the Cisia Consortium. This provides for a substantial modification to the pre-selection phase, by basing the pre-selection on the Online Test carried out at the 50 universities participating in the Cisia consortium establishing a selective admission threshold. In addition to this, the School has activated, in collaboration with the Scuola Normale and the University of Pisa, the project "Pisa welcomes the talent" to make available to all participants in the admission test services and opportunities in the city. Finally, the School will provide for the reimbursement of the costs of the trip incurred to participate in the tests, differentiated on the basis of the student's income.

| Indicator | History | | | | Goal | | | Notes |
|---------------------------------------|---------|-------|-------|------|------------------|------|------|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Applications per honours student post | 17,24 | 18,86 | 17,85 | nd | >=19 (triennium) | | | 2016-2018 three-year average increase (18.01) to 19 in the 2020-2022 three-year average. A progressive growth up to the target is assumed. "Applications" refers to the number of natural persons (candidates). |

Training Goal 3

Full time Talent training: Honours Students

The School identifies talents through the entry selection process and then cultivates and helps them grow by offering a training programme that is tailored to specific students and the development of their individual potential, guided and monitored by a tutor and organised in classic University courses, introductory modules to research work, workshops, group activities, sessions to evaluate the training programme, gaining experience abroad, internships etc.

The following strategic objectives, relating to internal teaching activities, have been set for Honours Students over the next six years (also in accordance with Ministerial Decree (DM) No. 439/2013 Accreditation of Higher Education Institutions):

- **Reviewing the Students' training programme based on curricula** (differentiated for level 1, level 2 and the unified course of studies) in order to facilitate the choice of the student's own supplementary education, while promoting the interdisciplinary connotation by including in the study programme research experience, transversal skills and scheduled off-campus days. First of all, the objective for the first three-year students is that of educating persons from the cultural and scientific point of view. The traditional teaching activity should be reconsidered by overcoming a rigid division between classes and facilitating the interdisciplinary approach regarding a basic knowledge set able to strengthen the student's cultural and scientific heritage. The students' knowledge should be further integrated with the development of skills, without which the knowledge gained is likely to remain unproductive, and with the transmission of values which form the basis of civilised living and are essential to achieve a balanced and coherent progress of a community, values which are clearly stated in our Charter. Lastly, experimental training experiences will be arranged in small groups again referred to the first three-year course, in the field of research and with exchanges with high profile foreign institutes.
- **Reviewing the training objectives for students attending the second two-year course/three-year course which will need to be more professional and specific.** Internships and collaborations structured towards research activities performed in our Institutes may be foreseen, if adequately developed in terms of training objectives, activities to be performed and methods of assessing the knowledge learnt.
- **Upgrading and encouraging the tutoring schemes** in order to guide the student in the early years of university studies, in the stage of defining the training experience and preparing the School's first level honours diploma thesis up to the moment, once the educational programme has been completed, in which a Student approaches the outside world and enters the labour market. Training initiatives will be foreseen to improve the quality of the tutoring activities performed by the teaching staff. These initiatives will be managed by the Deans in favour of the teaching staff, in particular the newly appointed teaching staff.
- **Strengthening the College** that constitutes one of the more successful intuitions of our School, and represents a fundamental educational experience for the students because it facilitates the interdisciplinary exchange and offers a range of opportunities for the student's growth with and for fellow students in all aspects of personal growth. The various logistic options which are viable and sustainable in financial terms will need to be analysed in order to increase the number of students, arranging off-campus housing solutions on an experimental basis from the first year 2019-2020 and for final year students, or small flats for groups of 4 or 5 persons, where the students can experiment their independence and organise their life in all aspects, including logistics.

With regard to the residential facilities in the College and student positions included in the call for applications, the intention is to increase the number of Honour Student positions to **achieve a 30% increase in the number of students** at the end of six years by finding new accommodation facilities and optimising the room occupancy, as well as increasing the number of off-campus flats for students in their final years. The economic coverage will be achieved by a combined use of the "FFO" (ordinary funding of universities) and fund-raising campaigns. The increase in the number of students will only be implemented if the previous conditions are satisfied.

Declination of the goals for the next three years

- Responsible professors: Deans of the two Classes
- Offices involved: People and Organization Area - Student Office - Technical and Management Area

Description of objectives and related actions

The School intends to start the process of revising the training course and the training objectives according to the strategic guidelines described above in the three-year period and to improve the quality of the professors' tutoring activities by organizing training initiatives in their favour supervised by Deans, in particular with reference to the newly appointed professors.

With respect to the goal of strengthening the college, starting from the year 2019-2020, external housing solutions will be tested for the students of the last year, that is, small apartments for groups of 4 or 5 people in which the students can experience the autonomy and organization of their life. This will allow to increase the number of honour student positions. The objectives will be monitored with a special annual

assessment survey of the training course to be planned in 2020.

Resources for implementation

The economic coverage of the strengthening of the college will be achieved by a combined use of the "FFO" funds and fundraising campaigns.

Moreover, the Cavallini Foundation has made available a shared apartment for 3, where students of the last years can stay. A second apartment for 4 people is expected to be available in 2020.

In addition, the "Talent at work" philanthropic foundation is just started, consisting of private companies that have signed a manifesto and of which the School will be the main beneficiary. For 2021 and 2022, the increase in the number of places for students and the identification of suitable college structures will be the main purposes of the Foundation's fundraising. The possibility of using a building of a public body suitable for the purpose is being verified.

The estimated costs for the new students are equal to € 70k in 2020, € 105k in 2021 and 2022. The estimate of the cost of the students for 2021 and for 2022 was made on the basis of the estimate resulting from the resolution of the Board of Governors of June 25th 2019. 2020 coverage is substantially present in the budget proposal. The coverage for the 2021 - 2022 differential with respect to 2020 will be found with the aforementioned external resources.

| Indicator | History | | | | Goal | | | Notes |
|---|---------|------|------|------|--------------------------|--------------------------|--------------------|--|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Number of Honours Students | 285 | 277 | 289 | nd | +8 (50 posti annuali) | +4 (54 posti annuali) | maintain | Warning: those that appear in the pos are the numbers of the students active or in extension. They do not coincide with those of the Board Resolution n. 159 of June 2019. For 2021 the increase is conditioned by the recovery of external financial resources. |
| Total Training Credits awarded to Honours Students | nd | nd | nd | nd | >=50 hours | >=50 hours | >=50 hours | The ministerial decree foresees 50 + 20 hours, respectively for the academic area to which the student belongs and for other academic areas. The goal is expressed in terms of training hours for each student. |
| of which from different areas | nd | nd | nd | nd | >=20 hours | >=20 hours | >=20 hours | The ministerial decree foresees 50 + 20 hours, respectively for the academic area to which the student belongs and for other academic areas. The goal is expressed in terms of training hours. |
| Percentage of active learning hours (assessed by students) (%) | 32 | 30 | 35 | nd | +/- 5% di 32,45 | +/- 5% di 32,45 | +/- 5% di 32,45 | Variability margin +/- 5% of the average data 2016-2018 (32.45). |
| Average teaching satisfaction Honours Students (Faculty of Social Sciences) | 8,69 | 8,14 | 7,99 | nd | 8,5 (triennio) | | | 2016-2018 three-year average increase (8.27) to 8.5 over the 2020-2022 three-year average. |
| Average teaching satisfaction Honours Students (Faculty of Experimental and Applied Sciences) | 8,47 | 8,57 | 8,67 | nd | 8,7 (triennio) | | | 2016-2018 three-year average increase (8.57) to 8.7 in the 2020-2022 three-year average. |

Training Goal 4

Part time Talent training: visiting students

The School intends to launch new programmes of excellence, firstly with the University of Pisa but also with other Italian universities intended for students with a university curriculum comparable with the curriculum of undergraduate Sant'Anna students namely, students who are up-to-date with their University programme and have an average mark of not less than 27/30. Students with these characteristics who attend degree courses at the University of Pisa, at the other Tuscan Universities, and at the Italian universities will want to establish stable collaboration relationships, but also the students of universities which are not affiliated with the School and non-national universities can participate in the applications to attend our **track excellence** programmes, namely, educational programmes which focus on research topics, for example, songs for the School and for its institutes, with a proposal in part online and in part requiring attendance for a variable duration from one to three weeks in residence.

The Summer, Fall, Spring and Winter Schools will be open to Master's Degree students on a preferential basis. They will be held preferentially in English and will have places which are also intended for foreign students. These specific training programmes may also be designed as Research Lab sessions / curriculum traineeships for Master's Degree students integrated with teaching interventions linked to the research work performed by the School's teaching staff, thereby favouring a closer co-operation of Italian

and foreign Master’s Degree students with the research activities performed at the School.

Students who follow the Sant’Anna School “track excellence” programme successfully will receive a certificate from the School, in addition to the Master’s Degree diploma that they will receive at their university of origin expressed in Training Credits (CFU) and a final mark.

As a preference, the School will seek to ensure that training is residential, and forecasts using the college structures freed up by honours students during stays abroad and, when possible, some additional residential solutions.

The funding sources to support this line of action, also open to foreign students, will be the students’ participation fees, duly calibrated based on the ISEE (Equivalent Financial Status Indicator) of the family of origin, and possible contributions made by sponsoring public and private entities which may fund the planning stage and participation scholarships. These talented visiting students originating from various Italian and foreign universities will be able to familiarise themselves with the School’s research activities and its PhD programmes, thereby increasing the base of possible candidates for the School’s PhD courses.

Declination of the goals for the next three years

- Responsible professors: Rector, Deans of the two Faculties, Advanced Education Delegate
- Offices involved: Strategic Projects Unit

Description of objectives and related actions

The goal that the School has set itself is to start the described initiative already in 2020, proposing a two-year programme.

Resources for implementation

The funding sources to support this line of action, also open to foreign students, will be the participation fees of the students themselves, calibrated according to the income of the family of origin and possible contributions from public bodies and private sponsors who will be able to finance the phase of design and scholarships for participation. Contacts are already in place with other Italian universities to establish the first networks. These activities will not be supported by FFO but by external funding and / or margins of the School. Funding is also provided by private companies interested in sponsoring these "Seasonal Schools".

| Indicator | History | | | | Goal | | | Notes |
|--|---------|------|------|------|--|--------|--------|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Funding raised (thousands of euro) | nd | nd | nd | nd | 45.000 | 60.000 | 60.000 | |
| Number of track excellence initiatives | nd | nd | nd | nd | activation and proposal of a two-year program with a number of initiatives to be defined and started in 2020 | | | Defined for the biennium. |
| Number of partner Universities | nd | nd | nd | nd | | | | Defined for the biennium. |
| Quality User satisfaction | nd | nd | nd | nd | >=8/10 | >=8/10 | nd | Defined as a threshold, as the reference data is missing. |

Training Goal 5

Focus talent training: partnership Master’s Degrees

The School already offers Master’s Degree Courses jointly with other universities (University of Pisa and University of Trento) in the following sectors: Economics, Political Science, Biotechnologies and Bioengineering. The main reasons for these training programmes are represented by enhancing the relationship between education and research in areas where there is a strong focus on the research work and which have achieved successful results in terms of the offer quality and the ability to attract merit.

The training activity in this area is undoubtedly complex for the School’s organisational structure, especially if the School intends to be the administrative headquarters in the future. The assessment must be made on a case-by-case basis, according to the circumstance and its consistency with the School’s overall strategy.

In this context the School will assess, based on a proposal from the research groups, which areas are to be upgraded in the situations where real opportunities and needs for development exist (for example at

the TeCIP (Communication, Information and Perception) Institute that is currently without active Master's Degrees).

Therefore, the offer of Master's Degree programmes will only be arranged when the School's teaching staff ensures an ample capacity to cover the lessons necessary, and preferably, in synergy with the Federation, if possible, with a certificate to be provided by the Federation itself (if the related legislation will permit this). The offer of Master's degree programmes will also be provided by enhancing collaboration with Italian and foreign universities which have proved to be the most active in their collaboration to date. The link between the Master's Degree and PhD (the so-called 2+3) will be enhanced, in the context of research training in some sectors which require it, if the necessary conditions are met.

A detailed description of the Master's Degree programmes can be found here: <https://www.santannapisa.it/en/masters-degrees>

Declination of the goals for the next three years

- Responsible professors: Institute Directors e Master's Degrees coordinators
- Offices involved: Postgraduate training area; Institutes

Description of objectives and related actions

In the next three years, the school aims to maintain the existing training offer, improving its quality in collaboration with the affiliated universities.

Resources for implementation

The School annually assigns € 105,000 to the Master's degrees for the next triennium. Other resources can be found within the Institutes.

| Indicator | History | | | | Goal | | | Notes |
|-------------------------------------|---------|------|------|------|-----------------------------|------|------|--|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Master's degree students | 330 | 287 | 446 | nd | >= three-year average (350) | | | |
| Out-of-course Master's Students (%) | nd | nd | nd | nd | <5% | <5% | <5% | Defined as a threshold, as the reference data is missing. |
| Average Master's Degree grades | nd | nd | nd | nd | >=95 | >=95 | >=95 | Defined as a threshold, as the reference data is missing. |
| Quality user satisfaction | nd | nd | nd | nd | >80% | >80% | >80% | Defined as a threshold, as the reference data is missing. Data from external sources (universities that act as administrative headquarters). |

The goals of the Master's Degree programmes

Master's Degree in Bionics Engineering

Jointly offered by Sant'Anna School of Advanced Studies and University of Pisa, with the collaboration of IMT School for Advanced Studies Lucca.

The main objective of the two-year M.Sc. program in Bionics Engineering is to train a selected core of very highly qualified students that, besides acquiring high-level professional skills, will also foster the progress of research activities at the edge between engineering and life sciences. Bionics constitutes a frontier of research in engineering, featured by a deep interdisciplinarity. It targets the exploration and formalization of knowledge and the development of methods and advanced technological tools for understanding and modeling biological systems. This enables the development of innovative medical devices for the diagnosis and treatment of pathologies and of new high-performance products and processes in the industrial domain, e.g. based on neuromorphic and biomorphic principles.

The students will be provided with tools that will allow them to face multidisciplinary research themes and to interact in a fruitful way with scientists in different domains, such as medicine, biology, neuroscience, as well as with clinicians in the field of rehabilitation and surgery, pioneers of emerging industrial sectors and social scientists.

The Master program in Bionics Engineering is articulated in two majors: (1) Neural Engineering and (2) Biorobotics. Thus, the students can opt for a pathway centered on disciplines dealing with:

- the design, development and management of novel neuroprostheses and sensory systems, new methods for the acquisition and treatment of neural signals, robotic systems able to interact and

communicate with human beings by following social behaviors and rules related to their specific role in the society;

- the development of humans- and animals-inspired robot models, of robotic platforms and devices for surgery, targeted therapy, rehabilitation, functional substitution or assistance of upper and lower limbs, of artificial organs and of technologies for computational biomechanics.

A detailed description of the Degree courses can be found here: <http://www.bionicsengineering.it/>

The Master Degree is entirely in English and featured by a limited enrolment (20-40 students are admitted each year – currently 30 students are selected yearly), with a strong international and interdisciplinary nature.

A very important aspect is the strong and rigorous entrance examination, carried out to select the admitted students. Two sessions are planned: the former dedicated to extra-EU candidates, the latter dedicated to EU candidates. Both sessions are articulated in an evaluation of titles and in interviews (at least 30 min each).

A periodic monitoring and revision process of the Master Degree performance and objectives has been established, based on periodic meetings of the “Quality Commission”, composed of professors from Sant’Anna School, University of Pisa and IMT School for Advanced Studies Lucca. They analyze and update/modify, if needed, the overall vision, the strategic objectives and the implementation details of the education pathway.

Several courses in the Master Degree include practical internships and hands-on activities in different laboratories. They are carried out at the BioRobotics Institute premises, featured by advanced facilities and equipment in the field of bioengineering, robotics and bionics (<https://www.santannapisa.it/it/istituto/biorobotica/facilities>). The Master Degree thus constitutes a modern training offer that includes projectual works and laboratory activities, with frequent links to international partners and high-tech industries, and with the precise objective of favoring the full development of students’ talent and creative skills. Furthermore, the multidisciplinary training makes Bionics Engineering students suitable for taking a leading role in innovative enterprises, in both traditional and emerging markets. The Master Degree also aims to give value to students’ research and innovation attitude.

The planned objectives are the following:

- maintain the current number of students (30) yearly admitted, to guarantee a strong selection of high-quality candidates and to have a number of students adequate to deliver effectively and without dispersions the hands-on activities planned in the Master Degree;
- attract a growing number of candidates, thus to carry out a stronger entrance selection and thus to further increase the average quality of the students admitted to the Master Degree;
- maintain a strongly international nature of the Master Degree, increasing the number of foreign candidates but, in concert, also increasing the number of good Italian candidates;
- considering that the percentage of foreign students attracted has increased considerably in the last years, reaching 36.4% in 2019, and that the quality of Italian candidates is also growing year by year, an objective is to further increase foreign students admitted, but without forcing this parameters and without penalizing high-value Italian candidates;
- maintain an average exam score above 28, a threshold that guarantees the excellence of students.

Master of Science in Economics

Jointly offered by Sant’Anna School of Advanced Studies and the University of Pisa.

The aims of the Master of Science in Economics are to allow students to acquire:

- knowledge of methods needed to understand, analyze and control real-world economies and markets, both in a static and dynamic perspective; this will be done by providing students with a deep and analytical understanding of how economic agents behave and interact in modern economies;
- knowledge of mathematical and statistical methods typically employed to study how economic systems work both in the short and in the long run, with emphasis on descriptive, normative and prediction analyses.

Building on such a knowledge, the student of the Master of Science in Economics will be able to gain solid theoretical and quantitative skills, allowing her/him to analyze and interpret in critical and appropriate ways how economies evolve; what are the forces driving such an evolution; as well as to understand how individuals — or groups thereof — behave and interact; and what is the role played by economic institutions.

After graduation, students will gain the skills of a solid, modern economist, ready to look for top-level positions in the labor market, within national or international research centers, firms and top-ranked economic institutions; or to easily join post-graduate programs, such as Ph.D. courses in economics and finance, either in Italy or abroad.

The main objectives of the Master in Economics program are:

- to keep the number of students around the average of the last four years (i.e. 82);
- to keep or even improve final (graduation) grades and student satisfaction indicators at the levels obtained in the past (respectively equal to 105/110 and 85/100).

Website: <http://mse.ec.unipi.it>

Master Degree in Innovation Management (MAIN)

Jointly offered by Sant'Anna School of Advanced Studies and the University of Trento.

The Master in Innovation Management (MAIN) is jointly organized by the Sant'Anna School of Advanced Studies and the University of Trento. The Master aims to provide the advanced knowledge and the managerial and economic skills necessary for understanding, managing and enhancing innovation processes in a broad sense: technological, organizational and service (service management innovation). MAIN intends to form managers and entrepreneurs with multidisciplinary skills in the area of innovation economics and management, Information and Communication Technology (ICT) and strategic management of the company in a "dematerialized" economy, in which services are increasing their weight.

The Master is international (all courses are taught in English) and aims to attract the best Italian and foreign students interested in the topics of innovation, innovation management, management and corporate strategy. In the first year the courses are held in Trento, whereas those of the second year in Pisa. The first cycle began in the academic year 2010-2011.

The high managerial competences offered in the Master are successfully implemented through the collaboration between the Department of Economics and Management of the University of Trento and the Institute of Management of Sant'Anna School of Advanced Studies. Such collaboration allows to integrate and enhance the skills and research in the areas of innovation management and services with the aim of defining the highly specialized and highly qualified professional subject of this master's degree. The two institutions have a high scientific reputation, recognized internationally, also thanks to the participation in relevant research projects and networks of excellence at European and national level and in important collaborations with national and multinational industries.

The collaboration with the University of Trento is also strategic for the development in the research areas of the Institute of Management, as is already the case for other areas of the School.

The Master MAIN is part of the joint initiatives between the University of Trento and the Sant'Anna School of Advanced Studies based on the Collaboration Agreement signed in January 2009.

The courses provided by the professors of the School are concentrated in the second year and are equivalent to 30 ECTS of the total number of teaching courses.

The collaboration agreement currently provides for a maximum number of 28 students, established primarily to ensure the provision of quality teaching, but also for problems of maximum capacity of the classrooms available in the second year at the School for the needs of a fair didactic organization.

The number of applications has grown in recent years with a peak of 127 applications in the last academic year (2019/20). Over the years the number of Italian candidates has steadily increased, from 7 in 2010 to 79 in 2019. The applications of foreign students have been fluctuating, with a decrease starting from 2015, probably also due to the introduction of a minimal application fee at selection for candidates from non-EU countries on the basis of economic status. The percentage of the number of candidates admitted over applications has increased considerably, showing an increase in the quality of the applications

received. The share of Italian students enrolled has grown considerably in recent years, exceeding the 50% in the last three years. As regards gender, there is a substantial increase in the female students especially in the last three cohorts.

With respect to the background of the enrolled students, it is notably a various origin of the three-year degree with a clear prevalence (on average more than 60%) of the economic area (class 17 and L-18 and class 28 and L-33). The presence of students with an engineering background and other technical subjects fluctuates around 15-20%, while for the other disciplines, mostly humanities, the number of students is around 10%. The average grade on exams by active students in the various cohorts from the first cycle to date is generally slightly higher than 27, while it is higher in the second year exceeding abundantly the 28, thus confirming the high standard of the students.

The solid preparation acquired by the MAIN graduates makes them ready to continue their studies in doctoral courses in management or in innovation economics in Italy and abroad.

Data provided by Almalaurea shows a very high employment rate for graduates of the Master, which fluctuates between 86 and 88%. The average salary is close to 1,500 euros a month.

For the next three years the main objectives are:

- to maintain or improve students' score standards, both in exams and degree;
- to increase in the number of foreign students, defining finalized policies with the University of Trento;
- to increase in the support for student participation in valuable events and training initiatives organized outside the Master.

Websites:

<http://www.santannapisa.it/it/formazione/master-degree-innovation-management>

<http://international.unitn.it/main>

Master's Degree in International Security Studies

Jointly offered by Sant'Anna School of Advanced Studies and the University of Trento.

The Master in International Security Studies (MISS) is jointly organised by the DirPoliS Institute of Sant'Anna School for Advanced Studies and the School of International Studies (SIS) of the University of Trento. The collaboration between the two institutions started in 2012, initially through the successful joint management of the Integrated Graduate Programme in International Studies and Transnational Governance (IGTS).

In 2016 the DirPoliS Institute and the SIS upgraded and consolidated their collaboration by launching the Laurea Magistrale MISS, which improved the joint management formula and offered a new innovative and competitive teaching programme, able to attract a remarkable number of students with a reasonable starting cost. The MISS Programme aims to offer to the students knowledge and skills that develop multidisciplinary expertise on the issues concerning national and international security, with the ultimate goal of enabling the MISS graduates to pursue their professional careers – analysts, researchers and security experts – equipped with a sound background and with the awareness of the ongoing challenges in international politics.

The MISS Programme addresses the problem of security from a double perspective: on the one hand, it analyses traditional conceptions of state and military security; on the other, it investigates cutting-edge approaches which are currently at the centre of lively debates among scholars, pundits and policymakers (e.g. human security, societal security, economic security, environmental security). Special attention is devoted to the examination of critical security studies and to their analytical perspective – which sheds light on the social construction of national identities, the international system, the European integration project and the threats to global security. Moreover, the teaching programme addresses the legal aspects connected to security and especially the most significant changes of international law as well as the implementation of public policies which respond to security problems. Thus, during their education path, students enrolled in the MISS Programme can attend courses which deal with a wide range of security issues from different disciplinary perspectives.

The scarcity of available data at present do not allow to make a definitive assessment of the results achieved – as a matter of fact, the number of students enrolled is small and the historical series is too brief to base a meaningful statistical analysis). However, it is worth noticing that until now the MISS

Programme has showed an excellent performance as far as its attractiveness – the number and quality of applications has remarkably grown– and the regularity of the students' academic careers are considered.

Over time, the number of enrolled students holding a foreign BA degree has been progressively increasing: MISS attracts students who pass the exams, do internships abroad and graduate within the established time frame. It is reasonable to expect that MISS will show a positive development during the 2020-2022 period, on the basis of the positive and encouraging trends registered so far relative to the prosecution of studies (100% of the students enrolled concludes the second year), the faculty's characteristics (which are in line with the MISS didactic programme, since 100% of the faculty members belongs to the academic sectors related to security studies), the number of hours of teaching guaranteed by tenured Researchers and Professors and the faculty/students good relationship.

The positive results achieved so far within the framework of the MISS Program require a reflection about the opportunity to further strengthening the Programme.

For the period 2020-2022 the MISS Programme's Board – composed by Faculty Members from Sant'Anna School for Advanced Studies and from the University of Trento in equal number – is currently considering a range of actions aimed at strengthening and improving the educational path. Among the actions under consideration, there are the following:

- Increasing the number of enrolled students for each cohort (from 25 to 28), having consideration of the logistic and administrative capacity of the Sant'Anna School for Advanced Studies, as well as its mission in promoting standards of excellence;
- Improving the instruments for the evaluation of teaching activities undertaken during the first year (at the Sant'Anna School for Advanced Studies) as well as during the second year of the MISS Programme (at the University of Trento), thanks to adequate tools aimed to complement and integrate the ministerial requirements;
- Stipulating agreements with foreign academic institutions as well as with non-academic organisations in order to facilitate the realisation of internships and study exchange periods for MISS and for incoming students enrolled in foreign institutions;
- Organising a basic course of Italian Language offered by Sant'Anna School for Advanced Studies to support the integration of foreign students enrolled in the Programme since the first year;
- Strengthening the didactic offer thanks to the involvement of an increasing number of external lecturers – both academic and non-academic – for teaching and training activities;
- Consolidating the scientific collaboration with the Faculty members based in Trento through the joint realisation of pilot research projects aimed at stimulating a more research-driven teaching offer;
- Adopting the kit of innovative teaching tools developed throughout the project CREATES, to which Sant'Anna School for Advanced Studies is a partner.

Websites:

<https://www.santannapisa.it/it/formazione/masters-degree-international-security-studies-miss>

<https://international.unitn.it/miss>

Master's Degree in Molecular Biotechnology

Jointly offered by Sant'Anna School of Advanced Studies and the University of Pisa.

The Master's Degree in Molecular Biotechnology has the objective to prepare master students with a high qualification to carry out research and managerial activities in the various professional tasks, which belong to modern biotechnology domains, with a particular focus on those methodologies and technologies that develop and apply molecular biology and genomics approaches, both at single gene and at whole genome level. The great progress that happened in the structural and functional characterization of genomes, from viruses to complex organisms, allowed developing high-through-put and highly efficient platforms that, linking to genetic engineering and cellular and whole organisms cloning find application in all the areas of Life Sciences, becoming formidable tools to research and application in biomedicine, in microbial and plant biotechnology. Prompted by theoretical and technical

advancements biotechnologies are also growing in their economic importance. In Europe, biotechnological companies over all grew by 20% per years from 2012 to 2018. The most recent public data (Rapporto AssoBiotech 2018) show that biotechnology in Italy is steadily growing, with more than 13,000 operators, 571 companies and an 11.5 billion euros revenue, with a 22% increase in research and development investment and 38% of exporting companies in 2015, seven times higher than any other Italian industrial sector.

From the above and from the strong belief that molecular biotechnologies will become even more important in the near future, Sant'Anna School and the University of Pisa joined effort to substitute a previous LM in Biotechnology with the Master's Degree in Molecular Biotechnology, more oriented on genomic and molecular approaches. Furthermore, taking advantage of the strong expertise in plant biotechnology at the School, this programme strengthens plant biology and plant biotechnology component, previously poorly represented.

Sant'Anna School joining in this master's degree brought to an increase in its attractiveness, as documented by the number of applications. As for the "allievi" of School, the master's degree in Molecular Biotechnology has been the choice of all our first level undergraduates but one. It is also worth mentioning that from the academic year 2018-2019 the School is offering two additional positions for II level undergraduates specifically to enroll in this programme. In a one-year time the number of applications tripled. In the academic year 2018-2019 the total number of students enrolled in Molecular Biotechnology was equal to 30, as compare to 17 in the academic year 2015-2016. Overall, the quality of the master's degree in Molecular Biotechnology reached a very good level as compared to similar programmes in other Italian universities. Comparing to the quality standards of other master degrees in which School is directly involved, Molecular Biotechnology has a major limitation due to the fact that the majority of the courses are given in Italian with very few cases given in English. This has been a decision from the partner university, but it is a major objective of the next years to progressively increase the number of courses given in English. Since for the rest we believe that the standards are currently very satisfactory, it is our aim to maintain such high quality, keeping a constant effort in increasing the programme's attractiveness, especially towards non-Italian students.

Training Goal 6

Research talent training: PhD programmes

The School's PhD Programmes (Advanced training and Doctorate) constitute a strategic area of its excellence training, since they fully achieve the introduction of their respective trainee Students to a multi-year research programme. The PhD Programmes of the Sant'Anna School of Advanced Studies are aimed at brilliant graduates originating from all over the world, selected by means of a competitive entrance examination, with outstanding skills in scientific research and interdisciplinary processing. The Sant'Anna School of Advanced Studies announces a competitive entrance examination each year, for approximately 60 position with an equal number of scholarships, financed by the School itself, by the Minister of Education, University and Research (MIUR) and by external public and private organisations. The teaching activities are conducted in English for the entire programme, and have a duration of three years or four years.

In this area it is strategic to collaborate with public and private companies and institutions to activate shared research programmes and to be able to guide the research activity performed on topics of strategic interest for the funding body, with dedicated doctoral scholarships.

The PhD programmes offered by the School are detailed below:

- PhD in Management - Innovation, Sustainability and Healthcare
- PhD in Law
- PhD in Human Rights and Global Politics: Legal, Philosophical and Economic Challenges
- PhD in Agrobiodiversity
- PhD in Agrobiosciences
- PhD in Translational Medicine
- Sant'Anna/IUSS Joint PhD in Economics
- PhD in Emerging Digital Technologies
- PhD in Biorobotics
- PhD in Data Science

- PhD in Transnational Governance (in collaboration with Scuola Normale Superiore)

The PhD programmes are already subject to the ANVUR accreditation procedure that assesses the quality of the teaching staff of the respective PhD Board and of the related research facilities. The School intends to further improve its attraction for candidates in this area, by pursuing the following strategic actions:

- Continuous improvement of the quality of recruitment, above all for international candidates, measured before and after;
- Increasing the number of scholarships, also by strengthening the relationship with companies;
- Attracting foreign PhD students, by encouraging their mobility to the School's laboratories in the field of their Doctoral programme.

Overall, over the next six years the School undertakes to **increase the number of its PhD students**.

Until today objective difficulties have been experienced when managing the flows of foreign PhD students, to which a very significant proportion of time resources of the IRO (Office of International Relationships) has been associated. The immigration procedures (i.e. visas) are notoriously slow, complicated and time-consuming, and their substantial improvement can only be addressed at the ministerial level through the action of the University's highest echelons. At the local level, the School undertakes to simplify at least some of the steps and to significantly enhance the service levels through a careful review of the procedures and information systems which accompany the effective or potential arrival of international students and staff. This would increase the School's attraction as an international destination, improve the reception and promote the full and timely inclusion of all the new arrivals. The action between the central level and the specific requirements of the Institutes needs to be coordinated better (spaces, access, accident prevention training, guidelines regarding 'who to contact for help regarding', etc.). The organization climate survey highlights numerous suggestions by teaching staff and research fellows in favour of greater centralisation of the management of research doctorates, in order to guarantee increased coordination and standardisation of procedures.

In order to increase the appeal of our PhD programmes it will also be important to put in place specific action to facilitate the accommodation search, above all for foreign students with "campus" style solutions at least for the first year of stay in Pisa (refer to the specific section on logistics).

Declination of the goals for the next three years

- Responsible professors: PhD coordinators;
- Offices involved: Postgraduate training area – Institutes - - Istituti, Faculty Boards of the PhD courses, PhD coordinators.

Description of objectives and related actions

The School intends to further improve its attractiveness to candidates by pursuing the following strategic actions:

- continuous improvement of the quality of recruitment, especially of international candidates, measured ex ante and ex post, keeping the average of the period 2016-2018 over the next three years;
- increase in the number of scholarships, strengthening the relationship with companies and other financing bodies (up to 20 fully operational, depending on external financing);
- opening of PhD courses in new sectors, such as that of climate change, in line with the evolution of research areas;
- significantly enhance the level of reception service for international students and staff, in order to increase the attractiveness of the School.

Resources for implementation

With regard to the increase in the number of scholarships, the resources that will have to be made available must be obtained from external companies / entities willing to finance scholarships / research grants (Law 240/2010 and Ministerial Decree 45/2013), or - if the possibility arises - within the School (FFO funds) or at the MIUR.

Cost of a PhD scholarship, including stay abroad, research and canteen budget:

- 3-year course duration - annual scholarship of € 16,000 (gross beneficiary) and a total cost of €

67,713.66;

- 3-year course duration - annual scholarship of € 15,343.28 (gross beneficiary) and a total cost of € 64,313.66;
- 4-year course duration - annual scholarship of € 15,343.28 (gross beneficiary) and a total cost of € 91,892.60.

For the logistics of foreign PhD students, the possibility of using a structure made available by a public body and to be supported with the help of the “Talent at work” Foundation is being verified.

The 2020-2022 budget foresees costs of € 5,354,879 in 2020, € 4,386,972 in 2021 and € 3,871,599 in 2022; the reduction over time can be explained by the fact that the agreements in force to date with external subjects that will take effect in 2021 and 2022 are only partially defined and, therefore, the relative values compared to 2020 tend to decrease, representing in 2020 the 19 % of the total, in 2021 the 14% and in 2022 only the 6%. The target will have to be assessed on the basis of the agreements that will actually be finalised.

| Indicator | History | | | | Goal | | | Notes |
|--|---------|--------|--------|------|---|---|---|--|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Number of PhD Students | 378 | 372 | 345 | nd | + 20 | | | + 20 a regime nel triennio, come finanziamenti esterni |
| of which foreign students (%) | 26,72 | 29,301 | 30,435 | nd | +/- 10% di 28,82 | +/- 10% di 28,82 | +/- 10% di 28,82 | Variability margin +/- 10% of the average data 2016-2018 (28.82) |
| Dropouts, Withdrawals, dismissals of PhD Students (%) | 1,32 | 0,27 | 0,87 | nd | +/- 10% di 0,82 | +/- 10% di 0,82 | +/- 10% di 0,82 | Variability margin +/- 10% of the average data 2016-2018 (0.82) |
| Number of Scopus articles published by PhD students within three years of graduating | 111 | 151 | 143 | nd | average of one publication per year per student | average of one publication per year per student | average of one publication per year per student | |
| Quality user satisfaction | 80,95 | 82,66 | 83,69 | nd | 84 (triennio) | | | 2016-2018 three-year average increase (82.43) to 84 in the 2020-2022 three-year average. |

The goals of PhD programmes

PhD in Emerging Digital Technologies

(TeCIP Institute)

For an overview of the PhD in Emerging Digital Technologies, refer to the following website:

<https://www.santannapisa.it/en/education/international-phd-course-emerging-digital-technologies>

With respect to the indicators identified by the School, the PhD in Emerging Digital Technologies has the following objectives:

- increase the number of positions to a minimum of +2 fully operational in the three-year period with external financing;
- with respect to the percentage of foreign students, maintain a variability margin of +/- 10% of the 2016-2018 average and, therefore, remain in the range of 16.08%-19.66% in the three-year period;
- with respect to the percentage of dropouts, renunciations and resignations, to maintain a margin of variability +/- 10% of the average and, therefore, to remain in the range 1.34% -1.63% in the three-year period;
- an average of 1 annual publication for each PhD student three years after the publication of the qualification;
- increase the 2016-2018 three-year average of the quality of course satisfaction, setting the value of 84% as the 2020-2022 average as the minimum target.

PhD in Economics

(Institute of Economics - IUSS)

For general info about the 4-year PhD programme in Economics, please visit our website:

<https://www.santannapisa.it/it/formazione/international-doctoral-programme-economics>

The overarching strategic aim for the future years is to consolidate and possibly improve the quite good

positioning of the PhD Program as one of the best- and well-known PhD in Economics in Italy and Europe, especially regarding the quality and span of the teaching and research experience offered, which is intended to provide students with the skills, competences and knowledge close to the international frontier of research in economic studies.

This main aim will be pursued through the following strategic actions:

- continuing the effort to select high quality student, both from Italy and from abroad, taking a 1/3 of foreign students over the total number of students as the target over the next years.
- increasing the number of scholarships offered, both via strengthening the cooperation already in place with Italian and international academic institutions, and via establishing new relationships with non-academic entities, such as international organizations and/or companies which may manifest an interest in financing PhD positions in Economics, although our approach is to train students with broad competencies, not limited to narrow topics of specific interests of single financing institutions; the expected target is that cooperation with non-academic partners will enable us finance at least one additional scholarship.
- monitoring of results and continuous improvement and adaptation of the topics included in the coursework, which has been so far a strong added value of the Program, to keep pace with new research areas emerging internationally, including interdisciplinary themes linking Economics to other fields.

PhD in Data Science

(Institutes of Economics, DirPoliS, Management and TeCIP)

For an overview of the PhD in Data Science, refer to the following website:

<https://www.santannapisa.it/en/formazione/data-science>

The PhD in Data Science is a consortium comprising Scuola Normale Superiore (the current administrative home), University of Pisa, Sant'Anna, IMT School for Advanced Studies Lucca and National Research Council of Italy. Nine fellowships are assigned each cycle, along with an increasing number of externally-funded ones – this expansion is a high priority objective of the program leadership. Sant'Anna supports one fellowship per cycle, plus a second fellowship funded through the EMbeDS Department of Excellence (Economics and Management in the era of Data Science). The School's objective is to continue to provide this support, and to contribute to the pursuit of external funding sources.

The Sant'Anna School faculty involved in this PhD program belong mostly to the Institutes of Economics, Management, DirPoliS and TeCIP. A second objective of the School is to facilitate and streamline access to the School's infrastructure for the Data Science PhD students who work under the supervision or co-supervision of Sant'Anna faculty.

The definition of a national initiative is underway to create a series of coordinated doctorates in Artificial Intelligence and in which the PhD in Data Science could converge, maintaining its current consortium structure. Given the growing importance of research related to the use of big data, and of training in this field, the evolution and growth of the PhD in Data Science could be significantly stimulated by this national initiative. A third objective of the School is to contribute scientifically and didactically to this evolution.

PhD in Management - Innovation, Sustainability and Healthcare

(Institute of Management)

For an overview of the PhD in Management, refer to the following website:

<https://www.santannapisa.it/en/education/phd-management-innovation>

With respect to the indicators identified by the School, the PhD will implement the actions described below.

The target relating to the number of PhD positions will be pursued through the strengthening of the promotional strategy already in place since 2018. After abandoning the project integrated with the GSD (Gran Sasso Institute) PhD, the increase in the number of students was pursued through scholarships funded by external public and private entities. For the academic year 2019/2020, 2 externally funded scholarships were obtained (Carlsberg and Istituto Superiore di Sanità).

PhD in Management – Innovation, Sustainability and Healthcare has relatively low percentages of foreign PhD students. The envisaged improvement will be pursued on the one hand by unifying the rankings that have so far been separated between European and non-European candidates, and on the other by intensifying the promotional activity aimed at potential foreign applicants, for example (as already implemented in 2018 with excellent results) with listing on web search engines such as Find-a-PhD.

With respect to dropouts, renunciations, resignations of PhD students, the objective of minimizing them will be pursued by strengthening the quality of teaching, increasing the educational offer, pursuing integration with the teachings of other PhD programmes of the School and at foreign universities, promoting the co-tutoring mechanism, introduced in the PhD in Management in 2019.

The objective of promoting the scientific production of PhD students will be pursued through a greater integration of the PhD students with the research teams of the Institute of Management, continuing a path already undertaken for some time now that has involved students in research projects, with particular reference to international projects, with the possibility of exploiting this collaboration also by publishing the results of these projects.

The satisfaction rate expressed by PhD students in Management, although fluctuating in recent years, is close to the target set by the School. The goal is to improve the average satisfaction level.

PhD in Law

(DirPoliS Institute)

Please see the general presentation of the PhD in Law at: <https://www.santannapisa.it/it/formazione/phd-diritto> .

For the next three years our PhD in Law shall pursue the following objectives, which are tailored consistently with the DirPoliS Institute strategic plan:

- increasing the number of available doctoral posts, from 5 to 6: this shall be done by using residual budget resources, by the support from existing research funds, as well as by resorting to external sources, mainly from entities that shall be invited to contribute in some relevant research areas at the School.
- Consolidating the ‘internationalisation’ of the doctorate: the very rewarding results achieved in the last three years shall be improved, if possible, through strengthening interaction between the research and teaching staff and doctoral students, and in particular by referring to the prestigious foreign colleagues that are already in the board of the doctorate.
- Furthering and increasing the selection of the best research centers worldwide in order to insure doctoral students a fruitful stay abroad (between 3 and 6 months), and reaching 5 months as the average period actually spent abroad for research;
- Bringing world leading scholars at the School for a variety of short occasions to meet our students and discuss their research. Enhancing and optimizing the existing collaboration with foreign universities and fostering students exchange;
- Strengthening the attractivity of our PhD in Law in the international context so to keep the ascending trend started three years ago (one that brought applications from 40 to 90 p.y. and the applications from foreign students to a half of the whole number received, and three times higher than 4 years ago). This was a very high stake because the doctorate encompasses one single, albeit interdisciplinary realm, that of Law, which is traditionally considered to be ‘national’ by default.

As regards research:

- the PhD in Law shall go on transforming research in law by integrating diverse legal doctrinal branches (that are famously hard to ‘integrate’ given the experience of most universities); a complementary objective consists of making legal research capable of constantly overcoming national borders, so to feature in the best relevant international journals (regardless of the issue concerning law as a non-bibliometric field).
- Candidates’ projects selection shall be more and more oriented to consistency with research interests of the professorial staff and with strategic lines decided by the DirPoliS Institute, as defined especially in the areas of global governance, social and environmental sustainability, the rule of law, democracy and human rights, as well as AI new technologies.

Teaching programs:

- Increasing quality and focus; strengthening the interconnection with scholarly research, keeping at the forefront the research lines included in the strategic project of the DirPoliS institute.

PhD in Human Rights and Global Politics (HRGP)

(DirPoliS Institute)

For an overview of the PhD programme please visit: <https://www.santannapisa.it/it/formazione/phd-human-rights-and-global-politics-legal-philosophical-and-economic-challenges> .

The PhD programme in HRGP aims at further improving its ability to attract highly qualified candidates by implementing the following strategic actions:

- To consistently improve the quality of the recruitment process by applying criteria to carry more comprehensive assessment, before and after the selection, and to attract both non-EU and EU students, in order to achieve and steadily maintain a ratio of 1 to 3;
- To increase the number of scholarships by enhancing the relationship with private firms and other potential stakeholders; in particular the Coordinator and the Board pledge to secure the funding from external actors in order to co-fund an additional scholarship during the next three years (2020/23). This objective is in line with the general goal set by the School to gradually increase the number of PhD students;
- To bolster the level of assistance (logistical and practical) provided to the new PhD students, in particular those coming from abroad, in order to increase the School's ability to attract new talents. On the purpose of enhancing the attractiveness of the Programme, new actions will be undertaken to improve the existing synergies with the School's overall effort to facilitate the search for accommodations (especially for foreign students), at least during their first year in Pisa.

Furthermore, the PhD programme in HRGP is committed to pursue additional strategic actions in line with its specific characteristics and its vocation, which can be summarized as follows: the PhD programme in Human Rights and Global Politics (previously named PhD programme in Politics, Human Rights and Sustainability) is characterized by a strongly interdisciplinary approach, which implies the intersection among the following research areas belonging to different academic fields (SPS/01 Political Philosophy, IUS/03 Agricultural, food and agri-environmental law, IUS/13 International Law, SECS-P/02 Political Economy). The main goal of this three-year PhD programme is to provide an educational path which will enable participants not only to carry out sound academic research, but also to undertake professional careers within a wide range of international, national and regional entities, in both the private and the public sectors. The programme is strongly characterized by the plurality of disciplines involved, and one of its defining goals is to enhance the understanding and analysis of the different subjects by providing the PhD students with specific methodological tools. The didactic offer is structured according to a Teaching Program, which is entirely taught in English and specifically designed for the PhD students in order to support and better integrate the connections across the various disciplines. This approach has led to valuable results, including the increasing number of high-quality research outputs (articles and theses). In particular, it is worth underscoring that each PhD student must author at least two publications with an ISBN and/or an ISSN code.

In light of the above, the strategic actions envisaged include:

- To increase more and more the interdisciplinarity that characterizes the programme and place more emphasis on this aspect both during the selection process, i.e. when the project proposals are assessed, and in the subsequent phases;
- To improve the synergies between the research projects selected and the research activities carried out by the members of the Board of the PhD programme. Among the efforts made to achieve this result, it is worth mentioning the increasing participation of Board members in the research seminars organized by the students to share their work and exchange further ideas with peers and faculty members;
- To bolster a wider and deeper integration within and between different structures and spaces at the School. To this end, starting from last year the Institute has set up a PhD students' room and it aims at undertaking further efforts in this domain;
- To increase the didactic offer focussed on soft skills by providing additional courses, in addition to the already existing course on public speaking, in order to allow the students to improve also

- their social skills and learn how to interact in interdisciplinary environments and contexts;
- To monitor and maintain the current high-standards set by the programme with regard to research outputs authored by the PhD students, e.g. articles, theses and more in general publications with an ISBN or an ISSN code.

PhD in Transnational Governance

(DirPoliS Institute)

The PhD Programme in Transnational Governance, jointly set up by the Sant'Anna School of Advanced Studies and the Scuola Normale Superiore of Pisa, aims at improving its own activity through three main strategies:

- Improvement of the selection procedures with the aim to have high-level students with an international background. The objective is to maintain at least the 50% of the selected candidates coming from foreign academic institutions;
- Improvement of the financial viability of the PHD, and especially of the second Phd fellowship financed by the Sant'Anna School through an effective strategy based on both internal and external sources. As for the latter, the programme aims to increasingly respond to competitive calls and to strength the collaboration with other academic institutions (in Italy and/or abroad);
- Increase of the focus on the 'innovation' the programme. Beyond the internationalization mentioned above, we also refer to 'intersectoriality' that is the capacity to have an effective dialogue with practitioners and stakeholders on brand new themes, like technological innovation, climate change, globalization and population ageing.

PhD in Agrobiodiversity (ABD)

(Institute of Life Sciences)

For an overview of the PhD, please refer to the following website: <https://www.santannapisa.it/en/formazione/phd-agrobiodiversity> .

With respect to the objectives of the School for PhD programmes, the PhD in Agrobiodiversity intends to develop the strategies described below.

- With regard to improving the quality of recruitment, it has been a primary objective of the PhD for years, precisely in consideration of the peculiarities of the PhD itself, aimed primarily at the recruitment of students from Emerging Countries. The improvement has been constant and having consolidated contacts with local quality academic and research institutions has allowed us to improve the overall quality of the students who apply. This effort will be maintained.
- With regard to the increase in the number of scholarships, the objective is to increase the number of scholarships by one unit, in order not to exceed the teaching staff's ability to manage students, but only by obtaining external resources which can cover at least 50% of the total cost of a four-year scholarship. The ABD PhD is a four-year-long programme and, consequently, the cost of a scholarship (including the integration of the scholarship during the stay abroad, the research and canteen budget) is equal to € 91,892.60.
- With regard to climate change, considered in the context of the conservation and enhancement of plant genetic resources, the issue will be introduced starting from the academic year 2019 - 2020 with frontal teaching courses and with the possibility of carrying out research activities for the achievement of the doctoral thesis on these issues.

PhD in Agrobiosciences (ABS)

(Institute of Life Sciences)

For further details on the PhD see:

<https://www.santannapisa.it/it/formazione/phd-agrobiosciences>.

The PhD programme in ABS aims to further improve its attractiveness to applicants by pursuing the following strategic actions:

- continuous improvement in the quality of recruitment, especially for international candidates, measured ex ante and ex post, maintaining an overall percentage of around 13%;
- increase in the number of scholarships, strengthening the relationship with companies and other funding bodies (i.e. European Marie Curie tenders).

The PhD programme in ABS undertakes to significantly increase the quality of reception service for students and international staff, in order to increase the attractiveness of the School as a destination.

Moreover, the PhD programme in ABS the doctorate is committed to improving the transmission of internal information, with the translation of communications in English and with interventions aimed at making communication concerning seminars, conferences and meetings more efficient and timelier.

PhD in Translational Medicine

(Institute of Life Sciences)

For an overview of the PhD, please refer to the following website: <https://www.santannapisa.it/en/education/phd-translational-medicine>.

The PhD programme in Translational Medicine is characterized by multidisciplinary and vocation to develop projects in which the translational approach is pivotal.

The aim is to further improve the quality of the course by pursuing the following strategic actions:

- 1) Continuous improvement of the quality of recruitment, especially increasing the number of international candidates;
- 2) Increase in the number of scholarships, strengthening the relationship with research institutions that historically have collaborations with the members of the PhD Board and identifying potential philanthropic associations interested in financing and/or co-financing PhD scholarships.
- 3) Strengthening of educational and scientific exchanges with other PhD courses inside and outside the School.

With regard to point 1, a number of actions is planned in order to increase the visibility of the PhD course in translational medicine for foreign candidates (e.g. improvements to the contents and presentation of the course on the website). Furthermore, targeted interventions are foreseen at foreign institutions where research collaborations have already been established.

With regard to point 2 (increase in the number of scholarships), it is planned to consolidate the already strong relationships with the Institute of Clinical Physiology of the CNR and with the Italian Institute of Technology and to strengthen that with the Pisa Science Foundation and with the University Hospital Meyer of Florence who are interested in funding scholarships on specific research topics. Contacts were also made with philanthropic associations (e.g. Rosa Pristina Foundation) which expressed interest in founding PhD scholarships in the biomedical field.

With regard to point 3, it is planned to consolidate relations with the MeS Laboratory and to strengthen training and scientific exchanges with the Institutes of Engineering of the School. With regard to relations with institutions outside the School, it is proposed to exploit the relations of professors and researchers that belong to the PhD Board with high quality research institutions aimed at the mobility of students and researchers.

PhD in Biorobotics

(BioRobotics Institute)

An overview on the PhD program is available here: <https://www.santannapisa.it/en/education/phd-biorobotics>.

The PhD in Biorobotics is an international program of advanced education aimed to research, which is funded both by government funds, international and national research funds, as well as through specific agreements with external entities (e.g. industries or research centres).

The ability of the BioRobotics Institute to attract external funds allows PhD students to actively participate in research projects and, on the other hand, ensures to admit more students than those normally supported by government funds. In this way, for each PhD Call for admission, the awarded PhD positions

are 6 times larger the number of positions funded by the University.

The 4 main challenges of the PhD program for the future are listed below:

- the implementation of combined PhD-M.Sc paths (graduate program, as already experimented with the admission in the PhD program of students graduated in the M.Sc Bionics Engineering, a course jointly offered by University of Pisa and Sant'Anna School, that attracts both national and international B.Sc students)
- the balance between the high-level PhD placement and the management and development of the scientific and technological know-how developed at the BioRobotics Institute;
- the capability of the BioRobotics Institute to improve its facilities as long as the PhD program grows;
- the combination of science-based engineering programmes (also in the framework of the DIPE – Excellence Department of AI and Robotics) with practical research and education paths (linked to the ARTES 4.0 Competence Centre, coordinated by Sant'Anna School): the PhD Program in Biorobotics ranges from scientific to technological research, merging activities with a low TRL (tracked by the fundamental research criteria) and activities with a high TRL (measured through the industrial research parameters).

Training Goal 7

Long term talent training: Higher Education Training Courses

The School intends to develop the positive experiences gained over the last ten years in which the respective Higher Education Unit has successfully managed an extensive portfolio of educational initiatives, which are very different from each other, both in terms of topics and targets. In recent years approximately 12 first and second level University Master's courses have been organised each year (with a one-year study period) including one course that was entirely online, and more than 60 higher education activities in Italy and abroad. Most of the educational activities are conducted entirely in English.

The goal is to consolidate this trend over the next 6 years by maintaining the leadership position and the innovative capacity of the Higher Education sector that the School has demonstrated over the last ten years. The aim is also to strengthen the relationship between Higher Education activities and research activities conducted at the School, in perfect harmony with the main objective of providing attendees with knowledge and skills, as well as the aptitude actually required in order to operate in the best way possible in their field, taking into account specific responsibilities. It should be stressed that the Higher Education activity makes a significant contribution to the School's impact (i.e. The Third Mission of Higher Education): with this type of training initiative it is possible to have a direct impact on professionals who are already working and to accelerate transferring the School's values, skills and expertise outside the School. Activities conducted in the English language will be increased further (also to make them accessible to non-Italian students) and special attention will be dedicated to the need to innovate teaching methods, making them increasingly suited to educational goals. In this context, the School will also seek to increase distance training, which can precede or follow activities with students in attendance, in order to optimise the attendance of courses by participants and to reduce their costs.

In addition, the overall quality level of the courses will be maintained and where possible increased, also by maintaining the quality certifications and through the attainment of new national and international accreditations.

Declination of the goals for the next three years

- Responsible professors: PhD coordinators
- Offices involved: Postgraduate training area – Institutes –Quality enhancement representative

Description of objectives and related actions

The goal is to consolidate the trend of recent years while maintaining the leadership and innovative capacity of the higher education sector and to strengthen the link between higher education activities and research activities conducted at the School, in close synergy with the Institutes which are responsible for the design and the implementation of training activities. Activities in English will be further increased (to make them accessible to non-Italians too) and particular attention will be paid to the need to innovate teaching methods, to make them increasingly appropriate to the training objectives. In this context, we will also try to increase distance learning, preceding or following the activities in attendance, to optimize

the attendance of participants and reduce their costs. In this context, the possibility of the School acquiring its own e-learning platform to encourage teachers to provide a greater number of *blended* training activities (activities that call for at least a part of distance learning, in addition to the one in the classroom).

In order to update the teaching staff of the School and those who collaborate with a certain regularity with the higher education activities provided by the School, some *Train-of-Trainers* training courses and training activities will be organized aimed at increasing the knowledge and skills of the teaching staff regarding the use of the new teaching methods. In this context, the results of some research conducted on the topic by the School will also be used and enhanced, thanks to some European funding.

The overall quality level of the courses will also be maintained and -where possible- increased, also through the maintenance of Quality Certifications and the achievement of new national and international accreditations.

A detailed plan for Higher Education Training Courses is reported in the Italian version of this document.

Resources for implementation

The resources necessary to achieve the objectives of the higher education will be found with the registration fees, and with the contributions of external public and private subjects. The profits produced will be used to finance the activities provided by the School to improve the skills and knowledge of its teaching staff.

| Indicator | History | | | | Goal | | | Notes |
|---|---------|---------|---------|------|-------------------------|---------------|---------------|--|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Percentage of training hours for I and II level Masters in English (% of total hours) | 21 | 27 | 40 | nd | >=35% | >=35% | >=35% | Improvement compared to the average of the three-year period 2016-2018 (29.33) |
| Percentage of training hours in English (% of total hours) | 31 | 39 | 56 | nd | +/- 5% di 40% | +/- 5% di 40% | +/- 5% di 40% | Improvement compared to the average of the three-year period 2016-2018 (29.33) |
| Hours of Higher Education (calendar year) | 7.450 | 7.945 | 8.788 | nd | 9.000 | | | Average three-year increase 2016-2018 (8,523) to 9,000 fully operational in the three-year period. |
| Revenues from Higher Education (thousands of euro) | 2.330 | 2.357 | 2.938 | nd | between 2.300 and 2.400 | | | Average three-year increase 2016-2018 (8,523) to 9,000 fully operational in the three-year period. |
| Quality User Satisfaction | 8,26/10 | 8,26/10 | 8,18/10 | nd | >= 8/10 | >= 8/10 | >= 8/10 | Average three-year increase 2016-2018 (8,523) to 9,000 fully operational in the three-year period. |

Training Goal 8

Placement and nurturing of students around the world

Placement is intended to systematically monitor and facilitate the relationship between the Sant'Anna School of Advanced Studies and companies, supporting Honours Students and PhD students, Master's and Higher Education students from partner universities upon entry to the job market. The main activities promoted by the School include:

- **Partnerships and internships:** Over the years, the School has implemented **80** internships and partnerships with companies and public bodies for the purpose of developing curricular and/or extra-curricular internships for its students.
- **Job Fair:** a venture created and promoted by the School in 2014. Since 2016 SNS, IUSS, IMT, SISSA and GSSI have all joined this venture, which represents the only event at which all six Italian schools of excellence are jointly present. There are now over 50 participant companies, over 200 students from the 6 Schools (of which 119 from Sant'Anna at the 2018 edition) and around 1,000 interviews held every year. In addition to the JobFair, in 2018 the School hosted seven additional corporate presentations.
- **Career Mentoring:** an event that runs alongside the Job Fair annually and is dedicated to careers and the job market. In 2018 we held our third edition, and the venture involves the participation of Former Students who present their professional experience.

Strategic activities in this area are set out below:

- the inclusion of specific modules in the training programme for Undergraduate Students and PhD Students in order to acquire the skills and expertise required in the job market, also through interventions by business entities and by implementing curricular-related apprenticeships and internships in companies related to the professional opportunities offered by the various sectors

of the School.

- specific modules, also to be organised in collaboration with the Library, aimed at providing the skills and expertise necessary to direct the results of the research activity towards high-level scientific publications.
- increasing relations with the business world, in particular through the network of former Students and the Ex-Students Association, and enhancing the industrial contacts of the teaching and research staff. Strengthening the job meeting events (Job Fair) in which the Students and companies can meet and mutually introduce each other.
- constant monitoring of the employment outcomes of all the figures trained at the School, with particular reference to the effectiveness of the new educational initiatives proposed in the strategic plan.

Declination of the goals for the next three years

- Responsible professor: Prof. Roberto Barontini
- Offices involved: Strategic Projects Unit

Description of objectives and related actions

In the next three years we want to start the following strategic activities:

- inclusion in the didactic program of honour students and PhD students of specific training modules to acquire those skills required in the work sector, also through the participation of corporate subjects and the activation of curricular internships and internships in companies related to the professional opportunities offered by the various sectors of the School;
- increase in relations with the business world, in particular through the alumni network and the Alumni Association, and by enhancing the industrial contacts of teaching and research staff. Enhancement of job meeting events (JobFair) in which students and companies can meet and present each other;
- constant monitoring of the employment outcomes of all the figures trained at the School, with particular regard to the effectiveness of the new training initiatives proposed in the strategic plan.

Resources for implementation

- Placement activities are financed with resources allocated annually (€ 37,000.00) intended primarily for contributions for internships of honours students, but it is expected that over time they will decrease and that the School will increasingly count on resources made available by companies that participate in JobFair. To these funds, we must add the funding deriving from the Erasmus + Mobility Consortium program (approximately 94 k € in 2020 and 55 k € in the following two years) intended for periods of mobility for placement purposes for honours, PhD and master's students. For 2020 the financing amounts to € 38,947.85.
- The JobFair is carried out at no charge to the School thanks to the shares of the participating companies.
- For the year 2020, a project was presented to the Tuscany Region as part of the POR FSE 2014 - 2020 Program intended for the realization of a program of training interventions in support of the outgoing orientation path of the students.. The total funding requested is equal to € 78,484.00.

| Indicator | History | | | | Goal | | | Notes |
|---|---------|------|------|------|------|------|--------|--|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Job Placements for Honours Students | nd | nd | 82,1 | nd | | | >=85% | One year after graduation (National % is 55.1). The target is to reach 85% at the end of the three year period. |
| Job Placements for PhD Students | nd | nd | 85,9 | nd | | | >= 87% | One year after graduation (National % is 84). The target is to reach 87% at the end of the three year period. |
| Spin Off with former PhD students and temporary research fellows in the managerial sector | nd | nd | 1,0 | nd | | | >=3 | Data relating to the spin-offs which at the end of the year had only doctoral students and research fellows in the social structure. |

The Third Mission

Although it is not possible to disregard the definition of the Third Mission of Higher Education established by the “MIUR” (Minister of Education) and by the ANVUR⁵, the conversion of the Third Mission of Higher Education concept into strategic objectives is as follows:

The Sant’Anna School of Advanced Studies undertakes to upgrade its ability to produce value for the community, acting as a driving force for social and economic, cultural and technological development, through and beyond research and education.

This means going beyond the aspects of enhancement and transferring knowledge, including not only public engagement and permanent training initiatives, but also the other activities (partnerships, placement, supporting the institutions, communication etc.) which can produce value for the community, by pursuing a close collaboration with research and education. The spirit in all of these activities is that of enhancing the bi-directional contributions from the School to the stakeholders (institutions, businesses, third sector, students, researchers, citizens) and vice versa. In fact, the ability to create value is closely related to resources (economic, cultural, technological) which are made available by and to the School.

The general strategic reference for the School is represented by the United Nations⁶ 2030 Agenda, with its 17 objectives, 169 targets and 240 indicators.

The Agenda can represent a common reference for a multiannual commitment with the various stakeholders, and over the next six years the School can select the main areas of activity within this Agenda which will characterise its action and where it intends to measure its impact. This choice would be functional, inter alia, to effectively provide the periodic information regarding the School’s commitment and ranking, as THE has requested us from last year.

Another reference of a more project-related nature regards HEInnovate⁷, i.e. an OECD, European Commission and MIUR (Minister of Education, University and Research) initiative in which we are already involved and represent Italy, together with other ten prestigious universities. We present ourselves in this framework as institutions focused on innovation, creativity and entrepreneurship which effectively contribute to improving knowledge by dedicating our efforts to the creation of public value through a process of open commitment, mutual learning, discovery and exchange with all the parties involved in the local, national and international community” (Gibb, 2013). The continuation of this experience will enable us to improve our ranking in the framework of the Third Mission of Higher Education, and in particular, in the area of “knowledge transfer and collaboration”, together with the other partners. The School’s technology transfer model must be re-examined, also in this perspective, although being only part of our Third Mission of Higher Education, which moreover, has given the School a broad and positive visibility. This is the first point in a plan of action regarding the Third Mission of Higher Education.

The key focus of this reassessment regards the definition of the perimeter in question in which we would like to include the Third Mission of Higher Education in order to foresee:

- a broader and more inclusive definition of the areas in which the School is called upon to perform its role in the Third Mission of Higher Education, in particular, with reference to the Faculty of Social Sciences. In the coming years the School proposes to map and monitor all the activities performed which may have an impact on the policies adopted by the policy makers, on the promotion of issues with a high social impact and cultural promotion and to disseminate constitutional values;
- a greater correlation of the spin-off and patent policies with the School’s strategic orientation, so they can be considered as a source of positive impact, assessing forms of differential accompaniment

⁵ The Call for participation in the VQR 2004-2011, defines the Third Mission of Higher Education as the “propensity of the institutions to open up to the social and economic context, exercised by enhancing and transferring knowledge” and by including research and consultancy activities on behalf of third parties, participating in business incubators and technology transfer consortia, archaeological excavations, museum centres and the other Third Mission of Higher Education activities not related to activities performed on behalf of third parties, in addition to patenting activities and spin-off companies (paragraph 3 of Annex 2).

⁶ <https://www.unric.org/it/agenda-2030>

⁷ <https://heinnovate.eu/en>

for spin-offs and for the patent enhancement activities;

- the definition and application of rules (many of which already exist) to steer the creation, development and enhancement of the various forms of technology transfer, in order to optimise the structure, dynamics and the positive complementarity with the School's research activity.

There are some fields of activity which need to be strengthened in the years to come in the strategic vision and in the work plan regarding the Third Mission of Higher Education. For example:

- Information technology (IT) infrastructures and digital platforms essential in the continuous training area, but also the integration among the various components of the Third Mission of Higher Education;
- the network that the School has created over the years, starting from the Alumni Association, to continue with the spin-offs club, through the recent Competence Centre ARTES, which must be conceived as systemic hubs of the Third Mission of Higher Education activity;
- systematising the relations with external partners, starting from the businesses with which more than 700 relations, overall, have been mapped out which can be further enhanced by providing them with an overview of the different methods of collaborating with the School (research, continuous training, placement, internships). Obviously, a similar objective can be set with the institutions, with partner universities and with the other stakeholders.
- mapping the relations with national and international public entities to enhance our ability to have an impact, thanks to the research and training activities, in defining the country system's medium-term policies. The relations with the community of the School's former students will be key from this point of view.

Furthermore, at the time of writing this plan it should also be remembered that a grant amounting to 2.5 million Euro has been approved by the Regional Council of Tuscany for the preparation of a structure dedicated to the Third Mission of Higher Education and technological transfer in the area of the School's San Giuliano science and technology park.

The Sant'Anna School of Advanced Studies intends to systematically measure the results of its Third Mission of Higher Education, thereby assessing the impact it is capable of generating. To this end, the Third Mission of Higher Education indicators will be integrated in the updated management control and will be used to measure the performance of the School's different areas, together with those of the first and second mission. The indicators will be selected taking into account the indicators which already exist, some of which are already in use in the evaluation by the Minister of Education, and those which have been proposed by different international organisations in recent years.

Finally, the School intends primarily to affirm its commitment to environmental sustainability. For that purpose, a work group has established the strategic guidelines whereby the School can become a green school and a context in which all members of the School can consistently share and uphold conduct that respects our environment (see plan on the intranet).

Lastly, the assessments made by the teaching staff and research fellows must also include the results achieved in terms of the Third Mission of Higher Education, also for the purpose of the rewards to be assigned.

Declination of the goals for the next three years

- Responsible professors: Third Mission Delegate, Prof. Paolo Dario – Institute Directors
- Offices involved: Planning, Control and Research Unit – Rector's Staff

Description of objectives and related actions

The Sant'Anna School is committed to strengthening its ability to produce value for the community, acting as a driving force for socio-economic, cultural and technological development, through and beyond research and training.

The School plans, in the next three years, to pursue the following goals:

- to map and monitor all the activities that may have an impact on the policies adopted by policy makers, on the promotion of issues with a high social impact and/or cultural promotion impact, and on the diffusion of constitutional values;
- a greater compliance of the spin-off policy and patents with the strategic orientation of the School, so that they can be considered as a source of positive impact, evaluating forms of differential

accompaniment for the spin-offs and for patent enhancement activities;

- the definition and application of rules (many already present) to guide the birth, development and enhancement of the various forms of technological transfer, in order to optimize their structure, dynamics and positive complementarity with the research activity of the School;
- the use of IT infrastructures and digital platforms, essential for continuous training, but also for the integration between the different components of the third mission;
- to make use of networks that the School has created over the years that enhance technology transfer activities, e.g. the Students' Association, the spin-off club, and the Netval Proton and Jotto associations, or the recent ARTES 4.0 Competence Center, which must be considered as systemic junctions of the Third Mission activity;
- the systemisation of relations with external partners, starting from the companies with which more than 700 relationships have been mapped together, which can be further enhanced by providing them with a picture of the different ways of collaborating with the School (research, continuous training, placement, internships etc.); a similar thing can be done with institutions, partner universities and other stakeholders;
- the mapping of relations with public entities at a national and international level, in order to enhance the School's capacity to impact on the medium-term policies of the country system, thanks to research and training activities; relations with the alumni community of the School will also be fundamental in this perspective;
- to expand its network trying to project itself outside the Italian scenario, with particular attention to the dynamics of the European Innovation Council and Horizon Europe;
- to be a leader in identifying case histories (in line with the new ANVUR guidelines) that arise and generate multi-faceted impact from the School;
- to provide the School's honours students with student entrepreneurship through innovation and entrepreneurship management tools.

Resources for implementation

Reference is made to the 2020-2022 budget and potential revenues.

- Staff: it is proposed to allocate 3 units to an office dedicated to the third mission, to support the Delegate and the professors who assist him.
- Work spaces: it is proposed to allocate and set up office spaces for a total of at least 30 square meters with 4 workstations, and the possibility of using a meeting room.
- Missions: it is proposed to carry out about two missions per month on the national territory and 4 international missions per year by an average of 2 people of the unit, for an estimated total of € 32k. Other missions may be carried out at no cost to the unit, in the context of funded projects relevant to the third mission purposes.
- Expenses for promotional materials and for event promotion: € 5k.

Revenues from the following activities are expected to be obtained:

- IP licensing and exploitation: € 20k;
- projects funded by the European Commission and other international bodies: € 60k from 2021;
- national / regional funding and from active networks: € 20k.

| Indicator | History | | | | Goal | | | Notes |
|--|---------|-------|---------|------|--|------|------|--|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Total number of spin-off enterprises | 51 | 54 | 57,0 | nd | | | >60 | Defined as a substantially improving threshold, at the end of the three-year period, compared to the last data; a progressive growth is assumed in the same three-year period. Reference is made only to accredited spin-offs |
| Number of companies present at Jotto Fair | nd | 43 | nd | nd | >=43 | >=43 | >=43 | Defined as a threshold with respect to the last available data |
| Number of companies present at Job Fair | 40 | 51 | 52,0 | nd | > 52 | > 52 | > 52 | Defined as a threshold with respect to the last available data |
| Number of registered patents | 17 | 17 | 18,0 | nd | | | >20 | Defined as a substantially improving threshold, at the end of the three-year period, compared to the last data; a progressive growth is assumed in the same three-year period. |
| Number of projects on behalf of third parties | 149 | 223 | 243 | nd | average number 2020 -2022 > average number 2016-2018 | | | Please note: the reference data is missing. Average number for 2020-2022 > average number for 2016-2018, with possible fluctuations in individual years. |
| Number of social impact projects | nd | nd | nd | nd | 6 | 8 | 10 | In this category are: - institutional projects with public administrations with a high social impact to improve the well-being of the community - pro-bono training activities (e.g. training and integration courses for weak categories) - pro-bono consultancy activities (e.g. mentoring activities for startups or small production activities not related to the School) - civic engagement and / or generalist activities (e.g. charity missions, "Me.Mo" initiative) - lessons to primary and secondary school teaching staff |
| Number of international cooperation projects | nd | nd | nd | nd | 3 | 4 | 4 | In this category are: - missions in developing countries - internship at the School of people from developing countries - provision of free online training content for remote use by non-EU students - research projects with a high socio-economic impact in developing countries |
| Number of cultural and scientific dissemination initiatives | nd | nd | nd | nd | 30 | 35 | 40 | In this category are: - Number of orientation events at high schools - Number of public generalist events (Bright, Open Days, Sant'Anna Science Café or AperiScience, conferences on public current affairs) - Number of events to raise awareness of issues / issues of public interest (e.g. disease prevention, cybersecurity etc) - participation as sponsor or through interventions at festivals, general conferences etc. |
| Teaching staff involved in the cultural and scientific dissemination initiatives (%) | nd | nd | nd | 83 | | 85 | | Percentage calculated as an improvement of 120 teachers out of a total of 144 |
| Number of Public Engagement initiatives | 5 | 9 | 11,0 | nd | >=5 | >=5 | >=5 | |
| Number of radio and TV reports | 354 | 337 | 483 | nd | 420 (triennium) | | | Increase in the 2016-2018 three-year average (391) to 420 in the 2020-2022 three-year average with possible fluctuations in individual years |
| Number of reports in daily, weekly and periodic publications | 1.382 | 1.252 | 1.510,0 | nd | 1500 (triennium) | | | Increase in the 2016-2018 three-year average (1381) to 1,500 in the 2020-2022 three-year average, with possible fluctuations in individual years |
| Patents licensed or granted for use (%) | 29,25 | 38,20 | 45,23 | nd | | | >=45 | Defined as a substantially much improvement threshold, at the end of the three-year period, compared to the 2016-2018 three-year average; a progressive growth is assumed in the same three-year period |
| Number of spin-off enterprises active in the year | 48 | 53 | 53 | nd | | | >55 | Defined as a substantially improving threshold, at the end of the three-year period, compared to the last data; a progressive growth is assumed in the same three-year period. Reference is made to both credited and uncredited spin offs |
| Industry Income (knowledge sharing) scoring in THE ranking | 88 | 80 | 84,7 | nd | | >=84 | | Defined as threshold value: higher than the average of the results in the previous three years, ie greater than 84. This average objective already takes into account high value compared to THE categories (the highest ever compared to the others: teaching, research, citations and international outlook) |

From strategic goals to actions: organization and operating mechanisms

The strength of every organisation is based on the persons who are involved in that organisation. Every teacher, researcher, administrative staff or student must feel honoured to work for the School and the School, in turn, can base its reputation on the important contribution of each person. Merit, rigorous research, the attention paid to social and cultural issues, the multidisciplinary framework and an openness to international contexts, operating flexibility and efficiency are all characteristics to be developed in every area of the School as its own working style and approach.

The School wants to be a **workplace “of choice”**, with a fair and transparent management.

The purpose is to promote a philosophy of continuous organisational improvement, through the implementation of processes designed to increase the awareness, motivation and expertise of all members of the School. This section identifies the organisational policy of the school in three strategic points: the first relating to recruitment policies, the second to the organization climate and to management and internal communication processes, and the third relating to governance mechanisms and the organisational structure.

The recruitment process

With regard to the process of recruiting professor and researchers, in order to always ensure a virtuous circle where the teacher is honoured to work at the School and the School is honoured to be able to count on a valid and excellent teaching staff, we envisage that every application for positions as a researcher and professor made by the Institutes or at the initiative of the Rector is adequately supported in terms of the reasons for a new position in a given Subject Area (SSD). For this purpose, the School may acquire tools designed to identify the level of interest and the qualifications of possible candidates in the scientific, internal, national and international community. The aim is to raise awareness regarding the opportunities the School can provide and to ensure the utmost transparency that is always a guarantee of merit. For the strategic assessment of the recruitment proposals, the Senate may rely also on the opinion of a group of experts specifically identified and possibly integrated by members of the International Advisory Board (IAB).

In addition, the School can aspire to becoming a leading destination for potential visiting researchers who come from the best universities in the world and could represent fundamental links for future projects, joint publications, knowledge transfer and essential contacts for outgoing and incoming students and young researchers. The School will need to acquire sufficient resources to attract and host a growing number of visiting research fellows and visiting professors. Improving the hospitality capacity (e.g. office spaces, dedicated accommodation etc.) would increase the School's attractiveness for visiting research fellows interested in coming to Italy for short periods dedicated to research or would offer the School excellent potential returns in terms of research prestige and internationalisation. From this perspective, the School will assess the advisability of participating in a network of universities at a European and worldwide level to facilitate the exchange of teaching staff, research fellows and students.

The organization climate and the management and internal communication processes

In the 2019 summer, an organization wellbeing survey was initiated, involving teaching staff, research fellows, temporary research fellows and technical and administrative staff. This type of survey represents a fundamental tool to support the implementation activities of the next years Strategic Plan. The results of this survey provide information in order to identify the priorities for action, to steer the organisational improvement measures and to assess their impact over time. The level of participation was significantly high. The percentages are as follows: 72% of teaching staff, 68% of research fellows, 40% of untenured research fellows, 95% of technical and administrative staff. During the *Stati Generali* (general assembly held in September 2019) the results were presented and highlighted a series of strong points and some critical issues which require further investigation. These results represent a valuable resource to design measures aimed at enhancing the system

and monitoring the areas of potential organisational improvement⁸.

In particular, four areas of strength were highlighted:

Appreciation of administrative supervisors and reference teaching staff. Amongst technical and administrative staff, there is widespread satisfaction with and respect to direct supervisors. The respondents tended to appreciate, in particular, the sensitivity of their supervisors in relation to their personal needs, the ability to listen and the openness to the proposals made by the staff, as well as a willingness to acknowledge the merits of each person on a fair basis. Moreover, the results of the organization wellbeing survey highlight a general positive perception in relation to the ability of the supervisors to manage critical issues and conflicts, to communicate, to support the professional growth of their staff, motivate them and to assess them fairly. With regards to untenured research fellows, there is widespread appreciation of the ability of reference teaching staff to act as mentors, capable of motivating and supporting their collaborators.

Team spirit. The respondents tend to declare themselves to be fully willing to support their colleagues. A widespread perception of regard and respect by peers and a good team spirit emerge, which facilitate the circulation of information and horizontal communication within the working groups.

Sense of accomplishment in their work. The respondents tend to have a strong intrinsic motivation, fuelled by a high perception of their skills and expertise and by a high degree of independence when scheduling the activities. A widespread pride in their work emerges, combined with an awareness of creating value for the community.

Sense of belonging. The personnel that replied to the questionnaire tends to declare a high level of engagement that results in identifying with the School and the willingness to commit themselves more than is expected in order to contribute in the pursuit of the School mission.

The answers to the organization wellbeing questionnaire highlight also four main areas requiring attention and improvement:

Organization fairness. The lowest average values were recorded in sections of the questionnaire which identify opinions on organisational fairness and meritocracy. In particular, technical and administrative employees complain of unfairness on assigning workloads and responsibilities, inconsistency between the commitment required and remuneration, an inadequate differentiation of the latter based on the effective performance of each person, as well as a limited capacity of the organisation to reward the most deserving employees. There are also critical elements amongst teaching staff, research fellows and untenured research fellows relating to various aspects of the School's management activity. A more detailed qualitative analysis will be initiated next year to identify the determining factors and the proposals for improvement.

Career paths and professional development. Technical and administrative staff complain about a lack of clarity regarding professional development programmes, a weak connection between merit and career progressions, as well as limited possibilities of developing skills and aptitudes in relation to the qualifications required by the different roles. For teaching staff and research fellows, their evaluation of actions by the School in favour of matching working hours and free time appears to be critical too.

Communications. While opinions on information flows within the working groups and research areas are positive, the respondents are more critical in relation to vertical communication processes regarding strategies, plans, objectives, results and performance assessment criteria. Furthermore, possible areas for improvement emerge regarding cross-communication processes within the School, in particular, between the institutes, areas within the institutes and academic staff and technical and administrative personnel.

Involvement of personnel. The results of the wellbeing survey indicate possible margins for improvement in the methods of involving the technical and administrative personnel in processes relating to changes in the work organisation.

The following actions are envisaged to ensure that the School is able to pursue our strategic objectives in research, education and the Third Mission of Higher Education in the light of the objectives of the strategic plan and the results of the wellbeing survey:

⁸ The results are available at the School

- **To progressively reduce the gender gap** in the School's teaching staff and the governing bodies. To support actions and policies to ensure a gender balance in recruiting policies, in the composition of commissions, in support actions which make it possible to reconcile work and family commitments. In this regard, it is important for the School to promote actions in favour of reconciliation of working hours and free time. The climate survey did not emphasise significant differences in this regard between men and women, but the overall rating of action is low, above all for the administrative and technical staff, untenured research fellows and assistant professor. Greater efforts must be implemented above all for the youngest members of staff.
- **Activate a lean management process**, to allow the revision of the main administrative management processes of the School and allow the simplification of procedures and further efficiency and reduction of time. During 2019, four editions of a training-workshop of two days were held, open to all technical-administrative personnel, to prepare staff for the adoption of the *lean* method⁹.
- **To promote merit and reward the commitment** of the various members of the School, also in collaboration with the Quality Enhancement Committee and with the Evaluation Committee, by identifying improvement objectives each year which are shared with the Institutes and with the administrative personnel, and which also take into account expectations of the ANVUR. These objectives should concern the fundamental areas which reflect the School's mission: research, education and the Third Mission of Higher Education, enhancing the interdisciplinary and internationalisation aspects, and will be discussed at the time of defining the budget in a dialogue process among the Rector, the General Management and the Committee of each Institute. The School shall have to prepare a system of acknowledgement, enhancement, and dissemination of best practices and merit in every area, from research to education and to administrative support. Reward mechanisms will be reviewed so that contributions by each person are valorised together with the overall results achieved by the School; for teaching staff, there will be a tendency to discourage the choice of short-term contracts.
- **To upgrade the management control system** to monitor the ability to pursue the strategic objectives in every area. An IT platform, called "*Knowledge Data Bank*" (KDB), will be developed to allow the integration of the information already available within the School, as well as collecting other significant data for management purposes. The management control system will be accessible on the intranet and transparent to all the teachers, researchers and administrative personnel.
- **To upgrade the training programmes**. The training planning and management process is a structured process that develops in various stages, starting from an analysis of the training needs, with the annual transmission of the survey form to the various structures for a direct participation of the personnel receiving the interventions, to continue with the preparation of the Training Plan, in which the training events are planned, in line with the School's other planning tools; these training events must also be performed jointly with the other Universities (SNS, IMT, UniPi). Furthermore, the staff can view the courses attended, as well as the courses planned for the future by means of a platform developed within the School (Course Management Application – GECO). An even greater involvement of the technical and administrative personnel in defining the training offered to them could improve the relevance of that training with regard to the real needs of professional development. The following measures could move in this direction:
 - improving the periodic survey process to identify the training needs;
 - establishing a Training Work Group, open to the various members of the School and coordinated by the People and Organisation Area and representing the main professional groups;
 - the involvement of outstanding employees as teachers in training initiatives intended for

⁹ The programme includes an initial classroom training phase, lasting for ten hours over one and a half days, followed by in-the-field projects for the application of lean management philosophies to analysis and the improvement of the main organizational and administrative processes for the School. Due to the high level of demand received when the Rector launched the venture, four editions of the training-workshop have been scheduled. In line with the aim of the project, the composition of each four classes was defined by the Work Group using criteria suitable for maximizing uniformity amongst participants in terms of membership of Areas and Organizational Units, with the intent of promoting and facilitating integration between the various administrative structures of the School.

colleagues.

The School could also provide **cross-training initiatives** for temporary research fellows and young researchers, for example in relation to strengthening their **teaching skills and the use of innovative methods**, and could also provide a training programme for entrance to the School, providing information on the operation of the School, its sources and action strategy.

- **To upgrade internal and external communication actions.** Communication is a key tool to make the School better known and to inform how much the School can do for young people, economic and institutional players, and more in general, for the community. In recent years the School's central communication office has carried out very important work in terms of disseminating the research results achieved by the Institutes. We believe that this strategic function needs to be upgraded, by privileging a centralised management of the function. In fact, the reputational analyses show us that the School is well placed with respect to the rest of the University system, but that there is still a great work to be done to achieve a better understanding of what we do and the contribution we make available to the social and economic system and the knowledge of our country. In this regard it will also be appropriate to reactivate a reporting system enabling not only to provide an overall representation of our contribution to the community, as was the case fifteen years ago with the social report (the School measures the impact it makes), but also to address the needs of our main stakeholders, in particular, by answering questions relating to our Third Mission of Higher Education: to what extent is the Sant'Anna School of Advanced Studies able to perform useful research, transfer knowledge, to train experts corresponding to the market's requirements, to support the institutions, etc. Management of the **School website** still appears to be critical. Decentralised and diffused responsibility for website updating appears to be an unsatisfactory solution, since it causes extremely unstandardized results for the various institutes. We propose strengthening the central function in order to guarantee accuracy, timeliness and completeness of information transmitted.

With regard to **internal communications**, the climate survey results emphasise how the situation is still critical both at a School and Institute level.

A series of initiatives will be activated; the following measures could contribute to streamlining the circulation of information relating to strategies, processes, objectives and results that, although available, in practice are not very visible:

- a newsletter (quarterly or half-yearly) delivered by e-mail to all the personnel, containing an extremely brief and precise summary of the main facts and events which have animated the life of the School during the reference period;
- an annual meeting with the Rector and the Managing Director, dedicated to sharing strategies, processes, objectives and results;
- activating a F.A.Q. section managed by the Personnel and Organisation Area by means of which the research fellows and technical and administrative personnel can submit queries and receive instructions in relation to the functioning of the human resources management systems.

Declination of the goals for the next three years

- Responsible professors: Rector and Managing Director
- Offices involved: Planning, Control and Research Unit – Rector's Staff (Francesco Ceccarelli) – Human Resources Unit – PhD Unit

Description of objectives and related actions

In light of the objectives of the strategic plan and the results of the climate survey (which will be repeated every two years and therefore in 2021), the actions envisaged to make our organization capable of pursuing strategic objectives in research, training and third mission are:

- to gradually reduce the gender gap in the teaching staff and in the governing bodies of the School;
- to promote merit and reward the commitment of the various components of the School;
- to upgrade internal and external communication actions.

Resources for implementation

The resources are those included in the budgets of the various sectors.

| Indicator | History | | | | Goal | | | Notes |
|--|---------|-------|-------|-------|------|-------------|-----------------------------------|---|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Gender Gap | | | | | | | | |
| Female Honours Students (%) | 27,37 | 26,35 | 24,91 | 27,00 | | >=30% | | Definito come soglia sostanzialmente migliorativa, rispetto alla media del triennio precedente (26,21); si ipotizza una crescita progressiva nel triennio stesso |
| Female PhD Students (%) | 42,86 | 41,94 | 41,16 | 38,11 | | 50% | | Definito come soglia sostanzialmente migliorativa, rispetto alla media del triennio precedente (41,98); si ipotizza una crescita progressiva nel triennio stesso |
| Women included in recruitment committees (%) | nd | nd | nd | nd | | | allinearsi agli obblighi di Legge | |
| Communication/Collaboration | | | | | | | | |
| Participation in organisational climate survey (%) | nd | nd | nd | 63,95 | | maintain | | |
| Level of satisfaction in communication process (%) (1) | nd | nd | nd | 43,89 | | improvement | | Positive answers to the question "Is the circulation of information at the Institute level adequate?" (for teachers, researchers and research fellows - value 43.89%) |
| Level of satisfaction in communication process (%) (2) | nd | nd | nd | 40,46 | | improvement | | Positive answers to the question "Is the circulation of information within the organization adequate?" (for technical and administrative staff - value 40.46%) |
| Do the Institutes facilitate collaboration between the different research areas within them? | nd | nd | nd | 46,11 | | improvement | | |
| Do the Institutes facilitate collaboration with other Institutes? | nd | nd | nd | 33,89 | | improvement | | |

The organisational structure

In consideration of the strategic objectives and of the results of the organizational climate survey, the School must reflect on its governance structure and its effectiveness. Amongst Italian universities, in fact, the School is a small institution but it is organized with multiple bodies which contribute, in various ways, to its governance. We must consider if the functions of these different bodies overlap, in order to ensure that the overall governance system is more streamlined and effective, and we should also consider the functions of the Institutes. We recall that whilst the sectors and classes are structures defined in detail in the Statute, the research areas and number of institutes are not.

In particular, the climate survey highlights that the majority of teaching staff and research fellows are satisfied with performance by the institutes although performance by the research areas is the most effective. In particular, it is emphasized that the institutes should deal not only with research but also with the third mission of higher education and improvement of impact. There are however a significant number of teaching staff who are still critical of the validity of the governance model based on institutes, primarily with regard to responsibility for recruitment policies. There is in fact a risk of implementing disconnected structures with their own identity that is not perfectly integrated with that of the School. As often indicated by the International Advisory Board, the six institutes have different histories and identities and each of them could evolve differently, also in consideration of developments in the Federation. In the context of the process for the consolidation of the Federation, in fact, it will be important to monitor developments and organizational trials of joint initiative such as the Climate Change project and the federated department of Political Sciences.

The experience of the International Advisory Board, which is innovative in Italy, also requires careful evaluation so as to identify the best forms for the future, for the purpose of achieving the objectives underlying its establishment, ensuring that it increasingly acts as an advisory board steering future strategies and increasingly less as a board for the evaluation of results achieved. The collaboration and support of this board for the preparation of the present plan was extremely positive.

In order to guarantee the planning and coordination of specific interventions, we propose the establishment by the Senate of an advisory body dedicated to studying possible options for the development of the organizational structure and governance that can guarantee a greater ability to pursue the strategic objectives.

With regard to technical administrative staff, we believe it is necessary to reorganize, primarily with regard to the definition of the functions of the various institutes and the central area, in line with indications in the Strategic Orientation Plan, over the next six months. The management of personnel is the remit of the Managing Director. In this regard, it should be noted that the new Managing Director will take up service in the first months of 2020.

In this regard the strategic guidelines that we believe should be pursued are:

- **Upgrading the responsibilities and number of staff included in technical and administrative staff.** Over the past few years in fact, an increase in the number of teaching staff and projects managed by the School has not resulted in a proportional increase in administrative personnel. The action by and responsibilities of administrative personnel represent a fundamental critical factor for success on the global panorama, in order to support teaching staff and research fellows and to promptly meet the requirements of users. Over the next few years the School must improve these profiles and strengthen their management responsibilities in order to simplify and rationalize, to the extent possible, the organization of administrative activities. The **lean management** training-workshop currently being realized by the School will be dedicated to this action.
- **Upgrading the management control activity** by including, in a single structure, the support for all of the School's bodies and the information necessary to support the decision-making and management processes of the bodies and the institutes, including the activities in the area of the Third Mission of Higher Education.
- **Establishing a central Grant office** that can function as a reference point and hub between the Institutes and the central services in order to facilitate the presentation of international call projects, to upgrade the skills and expertise, and simplify the processes.
- **Upgrading and centralising the services which support the internationalisation strategies.** The resources available to the International Relations Office (IRO) are somewhat limited, with regard to the diversified and extended range of activities which should be within the jurisdiction of an office that has full responsibility for internationalisation activities (and not only, or not only predominantly in relation to the Erasmus mobility activities). There are margins for the purpose of sharing some practices, resources and duties within the Federation or among Tuscan Universities, for example, through the TOUR4EU association of the network of Tuscan Universities, but the majority of the activities require specific resources for the School.
- **Reorganising the services which support teaching activities**, above all in consideration of the launch of the initiatives for visiting students which will require a considerable organisational effort.
- **Upgrading the central communication function.**
- **Increasing all ICT and instrumental equipment and update it to state of art technology** for all members of the School and improve the information system and related applications. In this regard a specific project has been commenced for the purpose of defining the strategic ICT plan for the School. The project is available at the School.
- **Assessing the possibility of investing in professional management software** (able to dialogue with the ministerial applications), in order to improve the efficiency of the work performed by all the members of staff, and therefore, to leave more quality time for all those tasks for which the human brain is still the most efficient machine, including cultivating interpersonal relationships, communications between offices and between centres.

Declination of the goals for the next three years

- Responsible: Managing Director

Description of objectives and related actions

The strategic lines that should be pursued are the following:

- to enhance in skills and numbers the technical and administrative staff;
- to activate of the lean management project for the organizational review of the processes and

their simplification;

- to enhance the management control activity by including, in a single structure, the support for all of the School's bodies and the information necessary to support the decision-making and management processes of the bodies and the institutes, including the activities in the area of the Third Mission of Higher Education;
- the development of the "Knowledge Data Bank" (KDB) platform;
- to establish a central Grant office that can function as a reference point and hub between the Institutes and the central services in order to facilitate the presentation of international call projects, to upgrade the skills and expertise, and simplify the processes;
- upgrading and centralising the services which support the internationalisation strategies;
- reorganising the services which support teaching activities, above all in consideration of the launch of the initiatives for visiting students which will require a considerable organisational effort;
- upgrading the central communication function;
- increasing all ICT and instrumental equipment and update it to state of art technology for all members of the School and improve the information system and related applications. In this regard a specific project has been commenced for the purpose of defining the strategic ICT plan for the School.

Resources for implementation

The resources are those included in the budgets of the various sectors.

As regards the enhancement of the technical and administrative staff, the objective will be achieved through the search for new sources of financing and the remodeling of the various expenditure components within the budget.

With regard to the goal of " increasing all ICT and instrumental equipment and update it to state of art technology", the resources for operating costs are included in the 2020-2022 budget proposal, as well as the costs of investments within the limits of financial and economic sustainability.

| Indicator | History | | | | Goal | | | Notes |
|--|---------|--------|--------|------|--------|--------|--------|--|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Upgrading the skills, responsibilities of and number of staff included in technical and administrative staff | 182 | 193 | 199 | nd | | | 215 | |
| Evaluation of the training activities provided by the school for the staff | 3,69/4 | 3,26/4 | 3,23/4 | nd | >=3,40 | >=3,40 | >=3,40 | Maintenance compared to the three-year average |
| Establishing a central Grant office | | | | | 30% | 70% | | |
| Upgrading and centralising the services which support the internationalisation strategies | | | | | 50% | 100% | | |
| Reorganising the services which support teaching activities | | | | | 100% | | | |
| Upgrading the central communication function | | | | | 50% | 100% | | |
| Increasing and updating all ICT and instrumental equipment | | | | | 30% | 80% | 100% | |
| Launching the KDB platform | | | | | 50% | 80% | 100% | |

The logistic structure

The current status

The premises currently available to the School (owned, leased or otherwise) and used for its institutional activities have a total usable surface area of approximately 30,000 square metres, excluding open spaces, with fifteen principal locations in the Municipalities of Pisa, San Giuliano Terme and Pontedera, to which must be added the areas subject to a state property concession for the BioRobotics and TeCIP (Communication, Information and Perception) Institutes, in the buildings referred to as "Scoglio della Regina" and "Dogana dell'Acqua" in Leghorn, the laboratory premises granted for use by the InPhotec

Foundation situated in the National Research Council (CNR) Area in Pisa, the warehouse facilities in Montacchiello (owned property) and in San Martino a Ulmiano (leased property) and certain plots of land and apartments in the historical centre (via Carducci, via degli Orafi) which are leased.

By considering the fifteen main premises in terms of their geographic location, it can be seen that there are eleven operating centres in the Municipality of Pisa (ten in the historical centre), corresponding to more than 20,000 square metres, three operating centres totalling 2,300 square metres in San Giuliano Terme (in the La Fontina district) and the Sant'Anna Valdera Centre in Pontedera, which has a surface area of approximately 5,500 square metres.

The three colleges (in the Central Headquarters, Terzani and Faedo 50% shared with a SNS) have a total surface area of approximately 4,400 square metres (only considering the facilities to be used as rooms-accommodation in the case of the central Headquarters), and provide a total of 211 rooms, of which 164 are single rooms and correspond to 256 available beds (one double room in Faedo is shared with a SNS).

The 33 lecture halls are situated in various locations and have different sizes and occupy a total of more than 3,000 square metres corresponding to a total of 1,010 places.

The areas which are specialised and equipped as scientific and technological research laboratories correspond to approximately 2,300 square metres.

Scheduled Interventions

Until today the School's main building development projects have focused on two primary objectives: redeveloping and upgrading the central Headquarters and launching the construction of the science and technology Park in San Giuliano Terme.

The technical and technical-administrative procedures have been initiated for the central Headquarters, in order to implement two important redevelopment and development projects regarding the library and a portion of the garden adjacent to the library, in addition to the ongoing technical and managerial actions aimed at improving and maintaining the efficiency of the complex.

The library redevelopment project will include works to renovate and restore sections of wall, the integration and reorganisation of the technological installations and replacing the furnishings with equipment. All of the above is intended to upgrade and enhance the infrastructure in compliance with the principles of protecting historical buildings, while rationalising performance.

The work will involve a surface area equal to approximately 570 square meters and will enable a significant increase in the number of reading/consulting stations. These will increase from the current 50 stations to 88 stations, with a capacity to accommodate approximately 33,000 books. The users and the library staff will have available restyled and more efficient spaces, as well as spaces equipped with new air-conditioning, lighting, fire prevention and antitheft systems. The presumed cost to complete the project is assessed to be equal to Euro 1,243,000, including Euro 600,000 for the work to be carried out, Euro 345,000 for the furnishings and equipment. The remaining part represents the amounts available to the administration for the technical expenses, contingencies, tender expenses and VAT. The Board of Governors' meeting held on 25th March 2019, duly approved the project's final design, and also approved the complete financial.

The second major redevelopment and development project at the Headquarters concerns the outdoor area adjacent to the library and the Aula Magna Storica, in the area delimited by the boundary wall on the north side of the garden and currently partially occupied by the small building used as a storage facility. The works which have been planned address a dual requirement: i) to secure the boundary wall, subject to a significant misalignment that must be corrected by means of reinforcement, and ii) to exploit the space that the supporting structures will occupy, for example, a multi-purpose hall intended to accommodate reading/study stations, and in connection with (not exclusively) the nearby library, or usable as a great hall, for traditional teacher centred teaching activities or conferences or also as a large area for recreational activities, thanks to the flexible features. Therefore, a glazed pavilion has been designed, where the pavilion's steel load-bearing structures will also act as the supporting structures for the wall to be reinforced, and extends over a surface area of approximately 225 square metres, including 20 square metres for new bathroom/toilet facilities. The pavilion can accommodate up to 65 reading stations, or up to 75 stations in the "lecture hall" configuration, and in this way can also become third component of the conference centre consisting of the nearby Aula Magna and the Aula Magna Storica.

The need to equip the new multi-purpose area and the modernised library with adequate technological systems has produced the need/opportunity to carry out a systematic reorganisation and upgrade of the equipment and the plant engineering systems in the entire area of the Headquarters affected by the work, since there have been problems of efficiency and shortcomings linked to their marked obsolescence for quite some time now.

The estimated cost for the work relating to this second project is equal to Euro 709,500. The financial coverage for this project was identified and approved by the Board of Governors' meeting held on the 22nd February 2019.

The second and main building development initiative that the School has planned for some time now is represented by the "San Giuliano Project". The result of the design development and dialogue activities with the local authorities is represented by the masterplan of the "Sant'Anna Science and Technology Park in San Giuliano Terme", implemented by the town planning tools of the Municipality of San Giuliano Terme. The initial scenarios were considered to be the framework and the potential container for all future initiatives of the School's infrastructural upgrading.

As it is known, the first stage (or the first lot) of the future complex has reached the eve of initiating the final design, the stage immediately preliminary to the call for tenders for the work, after the complex events linked to the appeal to administrative justice recently rejected by the Tuscany Regional Administrative Court (TAR) with a decision favourable to the School. The final design, already approved in 2015, envisages the construction of two main buildings, in addition to minor accompanying works, intended to be used as the Headquarters of the Life Sciences Institute (approximately 4,500 covered square metres) and the Management Institute and PercRo Laboratory (approximately 3,400 square metres), respectively, corresponding to a total amount of Euro 24,338,000 (updated and approved by the Board of Governors' meeting held on 22nd February 2019), for which the financial coverage is guaranteed by own resources, by the sale in exchange of properties (to be identified) and by a funding from the Tuscany Region for € 2,5 million. The inevitable design review (delayed for approximately one and a half years due to the appeal) may entail the need to update the tender prices, with the consequent requirement of greater resources or downsizing the buildings foreseen.

Future prospects

The developments in progress at the School, the considerations regarding the School's future growth, the dynamics of the interactions between the School and the local system where the School is located, entail the necessary and ongoing review of the urban development strategies and the constant updating of plans and programmes.

Some possible solutions are in the preliminary study stage, for example:

- the need to increase the number of Honours Students, with a consequent requirement for a greater number of accommodation places;
- the need for space, in terms of residences and classrooms, in order to implement supplementary training programmes for visiting students and summer/winter schools;
- the opportunity to arrange residential facilities for PhD students at least for the first year of the course, above all for foreign students who have great difficulty in finding accommodation;
- rationalising and upgrading of the areas intended to be used as research structures a;
- upgrading the infrastructures for the teaching activities and for Higher Education;
- provision for infrastructures dedicated to technology transfer and to the Third Mission of Higher Education.

In the future the School intends to confirm its commitment to construct the San Giuliano scientific and technological park and will use all reasonable endeavours to identify supplementary sources of funding for its construction, also by considering project financing strategies.

With regard to upgrading and constructing the San Giuliano Centre, the Tuscany Region has envisaged in the regional law 65/2019 a funding to Sant'Anna School for the construction of a new building in the San Giuliano area, intended for technology transfer, for a value of **2.5 million Euros**.

Payment of the contribution is subject to the stipulation, by 2020, of an agreement between the Tuscany Region and the School to fund the portion of the park related to the technological transfer activities.

The agreement defines the following aspects:

- the terms, conditions and timeframes to construct the building intended to accommodate spaces for:
 - new start-ups as defined under article 25, paragraph 2 of Decree Law No 179 dated 18th October 2012, (Additional urgent measures for the Country's growth);
 - headquarters of enterprises arising from the applications of applied research for production or patent purposes, or spin-offs;
 - applied research laboratories for technological transfer;
 - shared work including meetings and conferences;
 - exhibition areas, laboratories for prototypes, inspections and controls and other service areas;
- the forms of co-operation with private companies operating in the high-technology sectors;
- the periodic and final reporting activities regarding the regional contribution.

Finally, in order to respond to indications in the Plan, further assessments are in progress in terms of availability of spaces and opportunities in buildings owned by the Municipality in terms of partnerships with other local institutions, in particular, Scuola Normale Superiore and the University of Pisa.

The operational choices which will emerge from the considerations in progress will require reasonably short implementation timeframes in order to produce the required efficiency, and which, therefore, will represent a discriminating factor for their identification.

All possible logistic solutions of interest and possible sources of funding will be analysed, for the purpose of strengthening the ability of the School to be a benchmark for talent in Italy.

Declination of the goals for the next three years

- Offices involved: ICT Services, Technical and Management Area

Description of objectives and related actions

- Redevelopment of the library;
- Redevelopment and development of the outdoor area adjacent to the library and the Aula Magna Storica;
- "San Giuliano Project";
- Acquisition of other spaces for residential use in partnership with other city institutions and / or with private entities.

Resources for implementation

Operative costs and investments are covered by the 2020-2022 budget and by specifically tied reserves.

| Indicator | Goal | | | Notes |
|---|------|------|------|-------|
| | 2020 | 2021 | 2022 | |
| Acquisition of other spaces for residential use in partnership with other city institutions and / or with private entities. | 20% | 50% | 80% | |

The economic-financial Plan

The economic and financial sustainability in the Strategic Plan

Analysis

The School has a stable economic and financial situation which has enabled policies targeting growth and an increase in staff thanks to growing FFO (ordinary university funding) resources (mainly linked to performance-related funding - *quota premiale* - and extraordinary plans/direct call procedures), to external research and training funding and to measures for the rationalisation of expenditure in the acquisition of goods and services. Moreover, positive economic performance for management has allowed the School to deal with strategic investment projects.

The following table sets out developments in the main FFO components since 2013, the year of commencement of the funding system, and of specific targeted interventions, such as for example funding of the Departments of Excellence 2018-2022.

Table 7 - Developments in main FFO components and additional targeted interventions

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Quota base | 23.391 | 21.288 | 20.955 | 20.726 | 20.112 | 19.759 | 19.422 |
| Quota premiale | 924 | 3.924 | 4.179 | 5.989 | 6.364 | 6.974 | 7.620 |
| Totale A = Quota base + Quota premiale | 24.315 | 25.212 | 25.135 | 26.715 | 26.476 | 26.733 | 27.042 |
| Borse post lauream* | 1.384 | 1.047 | 1.018 | 1.444 | 1.543 | 1.816 | 1.987 |
| Progr.ne triennale 2016-2018* | 162 | 167 | 222 | 187 | 146 | 146 | |
| Totale B = Totale A+ Borse +Pro3 | 25.862 | 26.426 | 26.375 | 28.346 | 28.165 | 28.696 | 29.029 |
| Totale C = Piani straordinari personale | | | | | | | |
| | 725 | 745 | 745 | 1.087 | 1.153 | 1.209 | 1.604 |
| Totale A+B+C | 26.587 | 27.170 | 27.119 | 29.433 | 29.318 | 29.904 | 30.634 |
| Ulteriori interventi finalizzati (Dipe e altri progetti) | | | | | | | |
| Dipartimenti di eccellenza 2018-2022 | | | | | | 2.944 | 2.944 |
| Incentivo chiamate dirette | 134 | 138 | 121 | 60 | 114 | | |
| Ricercatore Levi Montalcini | | | | 176 | | | |
| Reclutamento ricercatori 15-16-17 | | | 59 | 59 | 59 | | |
| Altro (integr.ne ind. maternità, fondo giovani, Rete GARR...) | - | 42 | 38 | 64 | 86 | 71 | 12 |
| Incentivo att. ricerca di base prof II fascia e ric. blocco scatti | | | | | 72 | 86 | 69 |
| Quota ricerca- ricercatore Levi Montalcini | | | | 17 | | | |
| Progetto internazionalizzazione congiunto SNS | | | | 100 | | | |
| Progetto ME.MO | | | | | 150 | | |
| Totale D | 134 | 180 | 218 | 476 | 480 | 3.101 | 3.024 |
| Totale generale A+B+C+D | 26.721 | 27.350 | 27.337 | 29.908 | 29.798 | 33.005 | 33.658 |

* quote assegnate fuori dal Dm FFO (dal 2014 incluse nel DMFFO); per utilità di confronto omogeneo inserite in tabella

dati in migliaia di euro

As mentioned, with regard to FFO funding, growth in the performance-related funding was of particular significance due to the greater weight allocated to it at national level and to the excellent ranking of the School with respect to areas subject to assessment (VQR - quality of research), assessment of recruitment policies and responsible and reliable autonomy in use of resources).

With regard to the composition of operating costs, over the years the School has endeavoured to increase teaching staff, including research fellows and technical administrative staff, also in the context of the stabilisation of fixed-term positions, and to apply the Government guideline of rationalisation in expenditure for the acquisition of goods and services. In particular, with regard to the first aspect, the final cost of personnel and the projected cost for future years reflect an increase in the employment of teaching staff, researchers and technical administrative staff (in accordance with recruitment plans preferring staff turnover and/or reallocation of staff by the Minister of Education, in accordance with provisions for the two Departments of Excellence and the extraordinary plans), transfers between positions, automatic increases in salaries and other items. The following graph indicates, for the period 2013-2022, respectively with the red and blue lines, performance in the cost of teaching staff and research fellows and the technical and administrative staff with respect to the FFO for each year (allocations for

post graduate scholarships are excluded from the FFO and the quota for the department of excellence is included for the part relating to revenues and costs).

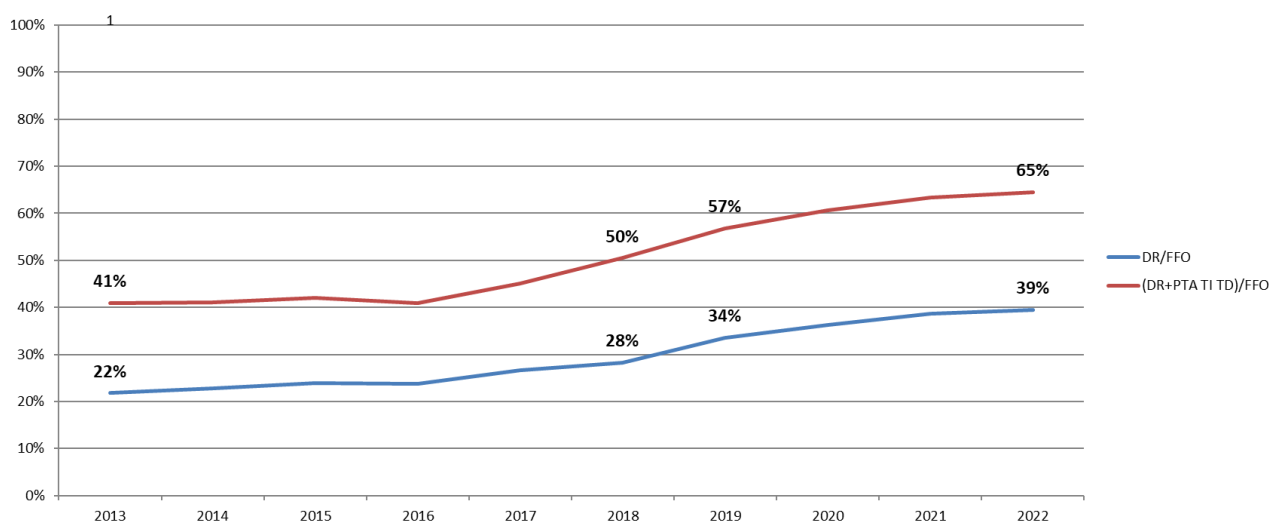


Figure 5 – Staff costs in relation to the FFO

Other components of particular relevance to costs relate to the PhD/Doctorates, services (for real estate, the residence and the canteen) and amortisation.

By way of this Strategic Plan, the School will take action that will guarantee its growth, from an increase in staff, to an increase in the number of honours students and PhD/Doctorate students, to the strengthening of the third mission of higher education and real estate development plans previously prepared and those resulting from action indicated above, which will be funded using adequate resources and shall be sustainable over time from a governance standpoint. In particular, it should be stressed that the line of action to increase the number of places for Honours students (both first and second level) is intended to be funded with *ad hoc* donations within the “adopt a talent” fundraising campaign.

Actions

In order to guarantee growth for the School and its sustainability, it is necessary to implement actions intended to maintain existing resources and to attract new resources. Below some lines of action relating both to government funding and to private funding are reported.

Department of Education funding

- With regard to the **FFO**, considering the growth in the weight of the performance-related funding (“*quota premiale*”) as compared to the total, the increase in funding in favour of the School shall be guaranteed by its ability to improve in respect of the three areas of the performance-related funding itself, such as VQR (quality of research) (in particular, considering that it has a minimum weight of 60%), an evaluation of recruitment policies (20% weighting) and responsible and reliable autonomy in the use of resources (20% maximum weighting). In fact, according to the 2019-2021 programming document, performance-related funding in the university system should increase from a minimum of 25% in 2019 to 26% in 2020 and 28% in 2021. Considering the already extremely positive performance by the School, the possible increase in FFO resources will however be limited. Moreover, the above document also shows that the base funding will reduce. The ability to improve indicators provided by the Minister of Education for the allocation of post-graduate scholarships (which have changed in the mentioned programming document) and for the three-year programming may result in an increase in the FFO, although it will be of minimal impact.
- Growth in FFO funding for the Sant’Anna School may depend on how much the Ministry wishes to allocate to special status universities in the context of the base funding, performance-related funding and post-graduate scholarships, as compared to the university system as a whole.

- Moreover, we believe that we can ask for a significant increase in government funding above all due to an increase in activities relating to orientation and social mobility and also in favour of track excellence initiatives. These are favoured by the Ministry of Education when based on collaborations with other Italian Universities.
- With regard to policies for the recruitment of teaching staff, the School has already submitted a proposal to the Minister of Education which aims to use margins on projects and commissions funded by external bodies which are now closed, in respect of which equity reserves are created. This possibility would ensure even greater independence for the School on defining research areas and would stimulate its ability and desire to **self-finance**. The Minister of Education has provided positive indications in this regard.

Public and private funding

- The School wishes to significantly develop its **fundraising** policies. The aim is to strengthen relationships with companies and public and private institutions that wish to become “**strategic partners**” of the School or who share our mission and can collaborate not only in the context of research, but also in relation to other components of our mission. In particular, we are currently defining strategic partnership agreements that will enable the funding of orientation activities, summer schools and even honours student and PhD student positions.
- The School proposes activating **a collaboration system between public and private institutions in Pisa which will enable it to raise funds to increase initiatives in favour of the promotion of talent**. During the Summer of 2019, Sant’Anna School promoted the “Pisa accoglie il talento” (Pisa welcomes talent) scheme together with the SNS and University of Pisa and all local authority institutions (Municipality, Palazzo Blu Foundation, Confesercenti, Primaziale di Pisa, etc.) in order to coordinate a series of incentives for students who came to Pisa to sit the Honours student entry exam. Due to the success of the initiative we can envisage increased activities in support of action intended to extend residences dedicated to our students and students of merit selected to participate in training ventures such as the summer/winter schools.
- The School intends to support and nurture the research teams that manage to contribute to **revenues through research projects awarded to them and on behalf of third parties**. An increase in and the improved efficiency of support services will guarantee and facilitate the pursuit of this objective and will enable further increases in this type of funding. The rules relative to withdrawals and awards will be subject to review.

The above action is naturally impacted by external factors. New regulations on financial requirements provided for the 2019/2025 period, intended to encourage the relaunch of investments and of research and innovation activities, mean that the School is bound by the financial requirements allocated to it by the Minister of Education, determined in accordance with these different objectives; the School hopes that this funding is adequate and will be adequate.