Report
of the President of TU Berlin
July 2017 to March 2021
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1

New alliances, new issues, new structures

Development of TU Berlin – an interview with Prof. Dr. Christian Thomsen, president of TU Berlin
Prof. Dr. Christian Thomsen,
President of TU Berlin
Working together with the mayor of Berlin in 2015, you initiated the Berlin digitalization plan. This was followed in April 2017 by the opening of the Einstein Center Digital Future (ECDF) and the announcement of the Weizenbaum Institut – Research for the Networked Society and Werner von Siemens Centre for Industry and Science in the following year. May 2020 saw the opening of the Berlin Institute for the Foundations of Learning and Data (BIFOLD), one of only five AI centers in Germany, under the management of TU Berlin. What does the establishment of such large-scale research alliances mean for the University in particular and research as a whole? What advantages and risks do you see here?

Initiatives such as this always provide the opportunity to address new issues within existing structures. In my view, such an approach requires the ability to address modern and socially relevant issues, to ensure that the requisite specialist expertise is present in the faculties and that we develop a level of openness to change. Specifically, inter and trans-disciplinary topics have the potential to pose a challenge to a faculty. The establishment of such institutions usually generates potential for obtaining research funding, supporting the modernization and extension of teaching and attracting the best students. This also enables the faculties to attract top-quality staff working in an interdisciplinary field. In sum, such projects bring great value to the development of the University.

The digitalization campaign was highly effective in establishing an institutional framework in Berlin to attract further funding. TU Berlin was able to secure some 50 million euros in funding over the next six years for the ECDF and its HEIBRiDS research training group alone. The digitalization campaign acted as a structural role model in the Excellence Strategy for the Grand Challenge Initiatives pursued by the Berlin University Alliance.

The campaign which we launched in response to climate change also presents an opportunity to renew the structures of our university; I have committed my full support to its realization and it has secured the involvement of researchers from almost every faculty. To be a success, this particular campaign requires good and prescient management. Its innovative nature requires a certain level of openness on the part of University members to interdisciplinary renewal of their working practices and risks the development of structural imbalances between the various subject areas.

The COVID-19 pandemic has brought radical, if temporary changes to university teaching; in making the changeover to digital teaching, we currently no longer function as a classical campus university. How do you regard this development?

Early 2020 saw a huge effort on the part of the teaching staff and students of TU Berlin, which enabled us to make a rapid transition to digital teaching. At present, the vast majority of teaching takes place online. This development was entirely unforeseeable and we have all learned a lot in the process. The streaming of classes is a clear indication of this change but is not the only possible method of providing digital lectures. The last twelve months saw the development of asynchronous lectures, which students can view at a time convenient to them. We have retained synchronous teaching at fixed times and with the participation of all classes which focus on direct exchange between teachers and students.
A further example is what I call the “flipped classroom,” which functions without streaming, but requires students to take on a greater level of personal responsibility. Another approach is that of “peer instruction” as pioneered by Eric Mazur of Harvard University. I also presented this concept at our Ziethen retreats on teaching and a range of publications. I believe that we were able to respond to the changed conditions presented during the first lockdown because the formats we used were already known to us in some form. We were also able to develop new formats, some of which will be retained over the long term. We are, and will remain, a campus university based around on-campus teaching. Learning is a profoundly social activity and can only take place in such an environment. Nevertheless, the “new normal” in teaching will no doubt be different to what we knew before the pandemic, and some of the most effective new methods of teaching will be retained. The new formats also permit students to take a flexible approach to their studies. We will no longer force students to adapt their routine to our offer and will need to facilitate a higher degree of flexibility than was previously the case. We owe this to those students who finance their studies themselves or have care responsibilities. These developments will enable us to take a step in the direction of greater social fairness for students.

**Digitalization and administration:** Some maintain that the two will never be reconciled. What is TU Berlin’s approach? Where are we and what aims have been set?

It is imperative that we achieve a digitalized University administration; a modern university is inconceivable without this. Moreover, students today expect it. We embarked upon a modernization process some years ago, but probably underestimated the level of complexity and communication involved. We are in the process of introducing modules step by step. We are supported in this process by a team of management consultants and the insights of our own growing expertise. One success in this area was the almost complete digitalization of the enrollment procedure in 2020. Human resource management has yet to be established on a digital footing, which meant that we were unable to make use of new technologies in this area during the pandemic. TU Berlin aims to establish digital procedures for the majority of its administrative tasks and benefit from the greater efficiency and savings which this will bring. We are reaching our goal step-by-step.

**Which lessons can we learn from the current pandemic?** What will the university of the future look like, and what do you expect from those in government?

We will have to wait and see exactly how universities develop. I would like to see TU Berlin enter a discourse about the opportunities for change and improvement in the “new normal”; this process should make use of the experience gained by universities both in Germany and abroad. I would like to see the continuation of openness to change which the University has embraced throughout the pandemic. We will also listen carefully to student feedback and their experience of the pandemic, what worked well and what worked less well or not at all.

I would like the government to provide universities with constructive support through this process of change and renewal and the funding to cover the extra costs which the transition to the “new normal” will incur. Above all, I would like the government to provide at least something approaching the level of funding for universities and their human resources that they plan for the commercial sector.
July 2019 saw TU Berlin achieve – together with Freie Universität Berlin, Humboldt-Universität zu Berlin and Charité – Universitätsmedizin – the status of a University of Excellence (Exzellenzuniversität) for the first time in its history. You started working with your opposite numbers in these institutions to form the alliance in 2016. What have you learned and how has TU Berlin profited?

The status of University of Excellence has brought us increased attention and strengthened our international reputation. However, we did not submit our application just to enhance our reputation; we want to benefit from the research opportunities which it presents, especially in the interdisciplinary fields which we have established with our partners. We know that the ability to make real advances in individual areas increasingly requires researchers to forge connections with other disciplines. Digitalization is just one example of this phenomenon; another is sustainability. Success in the Excellence Strategy has meant that researchers have been able to intensify cooperation between various projects. For instance, a project group combining engineers, natural scientists, social scientists and researchers from the humanities is currently working on the grand challenge social cohesion.

I have also learned that the various university management bodies often take a somewhat different approach to similar tasks; this sometimes slows progress but brings very clear advantages. Researchers at TU Berlin are now accorded far greater scope for participation in collaborative projects; and it is now easier for students to take modules offered by other universities and acquire certificates provided in interdisciplinary topics such as data science or sustainability.

You took part in the first March for Science in May 2019. The current pandemic underscores the value of science for the lives of individual people. Nevertheless, the period has seen the development of a certain level of popular hostility towards scientists, the denial of scientific fact and even funding cuts for certain disciplines in some countries. How do you view the current situation? Are there any grounds for concern?

Society has begun to pay greater attention to the scientific findings during the course of the pandemic. More people are listening to what scientists have to say, and policy makers in particular have begun to pay greater attention to their recommendations. In the fight against climate change, my principal hope is that scientific findings will be accorded greater influence than has previously been the case. This is the stated aim of a number of young people currently campaigning in Fridays for Future before going on to study, take up an apprenticeship or start their careers. This is also one of the demands of the Scientists for Future. In view of this situation, it is the duty of every university to ensure that this issue is taught in a professional, scientifically-substantiated and practical fashion. We must bear in mind that scientific findings and expert interpretations are attacked by people who are unable to substantiate their position. In other words, scientists have the responsibility to present facts and their interpretation of them in such a way that policy makers are able to take decisions in an informed manner. I do not have any reason for concern regarding this, but I appeal to scientists to remain steadfast in their approach.
In addition to digitalization, you place great emphasis on climate protection and sustainable development. You have shared a platform with Greta Thunberg, addressed a Fridays for Future demonstration in front of the Brandenburg Gate and initiated the Climate Change Center network. How would you summarize the current situation? Has the pandemic shifted the focus from the issue of climate change, or renewed our commitment to it?

A bit of both. The pandemic has checked our progress in establishing the Climate Change Center (CCC). We had already identified a number of private and public organizations with which we wished to enter a public-private partnership, for example the ECDF. Unfortunately and entirely understandably, the pandemic has delayed commitments from the private sector. Until the economy has stabilized, we have decided to concentrate on public sources of funding, supplemented by a small number of large companies, for whom climate change represents a clear focus. From this point of view, the pandemic has dampened progress in the fight against climate change. The topic remains one of the key issues facing humankind, it has just been forced to take a back seat in the short term. In one way, the pandemic has taught us that the research community can function pretty well with less official travel and the resulting environmental damage. As such, I am convinced that the “new normal” will involve much less travel and innovative approaches to staging conferences. Virtual conferences attract many more participants than “real” conferences did before the pandemic. We may even be able to hold every second conference in digital format. We will see.

The issue of quarter parity – the equal representation of all four status groups in committees – is still a hot topic and has been under consideration by TU Berlin for some years. At the end of 2020, the Extended Academic Senate and the Board of Trustees concluded a wide consultation exercise with the recommendation to adopt quarter parity in the electoral convocation for the election of the Executive Board. Does this decision change the composition and majority on the board? What lessons have you drawn from this? How will the situation proceed?

The issue of quarter parity at TU Berlin has been a matter of intense discussion over a number of years. The University has since come to a majority consensus on this matter and has established a new mode of election which satisfies the wish for equal participation of all four status groups in the election of the president and vice presidents. Only time will tell whether this will result in a “better” Executive Board. We are currently waiting for confirmation of this change to our statute from the Senate Chancellery as required by the Berlin State Higher Education Act. I am relieved that we are no longer locked in discussion of legal opinions. I am proud of the open culture of debate and openness to change which our university has displayed during this process. We are now free to turn our attention to the work of TU Berlin and our response to the pandemic.
Looking back, which experience impressed you the most?

Of the many visits of heads of state, CEOs of large companies, politicians and academicians to TU Berlin over the years, that of philosopher Judith Butler in January 2020 made a particularly lasting impression on me. In her defense of gender studies, she described how the deconstruction of traditional roles causes widespread unease. As she said, it is not the answers that we provide that worries people, but the questions which we ask.

Interview conducted by Stefanie Terp.
2

Structure & strategy
2.1
The Executive Board - members and tasks

TU Berlin is managed by its Executive Board. The members of the Executive Board have been in office since April 2014. After its re-election in 2018, the Executive Board agreed a new strategy to coordinate its response to the challenges faced by research, teaching, and administration. In particular, this concept focuses on the topics:

- Digitalization
- Sustainable development
- Transfer
- The strategic development of collaborative research
- The advancement of junior scholars

These topics are reflected in this report.

The following section provides an overview of the relevant office holders and their areas of responsibility:

Prof. Dr. Christian Thomsen
President

Prof. Dr.-Ing. Christine Ahrend
First Vice President
Research, Appointment Strategy, Knowledge & Technology Transfer

Prof. Dr.-Ing. Hans-Ulrich Heiß
Vice President
Education, Digitalization and Sustainability

Prof. Dr. Angela Ittel
Vice President
Strategic Development, Junior Scholars, and Teacher Education

Dr. Mathias Neukirchen (until July 2020)
Vice President for Administration

Lars Oeverdieck (since August 2020)
Acting Vice President for Administration
The following restructuring measures were undertaken in the reporting period:

**In the area of responsibility of the President / Vice President for Administration:**
- Integration of the Dept. IV event team in the Office of Communication, Events and Alumni
- Restructuring of the Operative and Strategic Reporting Team and Strategic Collaboration of Science and Art / Culture Team to form Strategic Controlling
- Establishment of Appointments and Strategic Cooperations
- Integration of the Charlottenburg Campus Office in Appointments and Strategic Cooperations
- Establishment of Central Procurement
- Integration of Campus Development into Department IV

**In the Central University Administration:**
- Integration of Organizational Management in Dept. II (IT-OM) and the office of the Vice President for Administration
- Restructuring of the sections of Department IV
- Restructuring of section VC
- Integration of the Office for Doctoral and Postdoctoral Services in the newly-established Center for Junior Scholars (CJS)
- Integration of the ProFiL program office in the newly-established Center for Junior Scholars (CJS)
- The integration of the MINTgrün pre-study orientation program in Department I

**Central institutes:**
- Establishment of Campus Management (ZECM)
- Establishment of the 3D Laboratory (ZE3D)
- Establishment of the BIFOLD central institute
- Establishment of the Center for Junior Scholars (CJS)

**Cooperation and communication**
Since taking office, the Executive Board has placed great importance on open and constructive co-operation and communication with the members of all status groups. This includes:
- Office hours, open discussion sessions and round table events hosted by the president and vice presidents
- The Executive Board newsletter to provide regular updates about the projects managed by the Executive Board
- The weekly bulletin from the president, in which he shares his thoughts on the current pandemic situation with all TU employees
- The establishment of working groups to address specific issues such as the establishment of appointment regulations, the transfer audit, the University Strategy, project applications or topics such as diversity and the advancement of junior scholars
• Joint conferences and round tables of the Executive Board, the faculties and the Central University Administration aimed at improving administration processes

• The Ziethen retreats, which give members of TU Berlin the opportunity to develop new ideas and guidelines for teaching and learning

• The TU Berlin summer festival and award of the "We are TU Berlin" prize, which both seek to strengthen the identification of University members with TU Berlin and reward the commitment displayed by members of staff

• The New Year’s reception hosted by the president of TU Berlin, which gives all those invited the opportunity to review the events of the past year and focus their attention on the challenges of the coming year

• The provision of data, data tools and analyses from Strategic Controlling
2.2
Strategic university development

Berlin University Alliance (BUA)

For the reporting period July 2017 to the first quarter of 2021, the focus of this section of the report is on the most important innovations developed and the progress made by the end of the reporting period. The joint application made within the scope of the Excellence Strategy was submitted on the basis of the outstanding success of the partners within the first funding line of the research competition, in which seven Clusters of Excellence were awarded funding in September 2018. TU Berlin is speaker of three of the successful clusters. The interdisciplinary research project Unifying Systems in Catalysis, Science of Intelligence, and MATH+ were awarded an initial seven years of funding from January 2019 with an annual budget of 10 million euros each (see chapter 4.2).

Through the establishment of the Berlin University Alliance in February 2018, Freie Universität Berlin, Humboldt-Universität zu Berlin, Technische Universität Berlin and Charité – Universitätsmedizin Berlin set themselves the long-term aim of working together to establish and develop an integrated research landscape in Berlin. Going beyond the establishment of individual networks, institutions and disciplines, the alliance is intended to represent the heart and mainspring of an excellent and transdisciplinary Berlin research “ecosystem.”

To this end, the Berlin University Alliance has set itself five aims:

1) The development of a Berlin-wide agenda for joint research into social challenges with global significance (Focusing on Grand Challenges)

2) The establishment and promotion of a network for multi-direction research and knowledge transfer centered in Berlin (Fostering Knowledge Exchange)

3) The concentration of the expertise present in Berlin for the evaluation and development of general quality standards for research (Advancing Research Quality and Value)

4) The establishment of an integrated career and recruitment space for outstanding researchers (Promoting Talent)

5) The establishment of a Berlin-wide network for research services and infrastructures (Sharing Resources)

This is supplemented by three cross-cutting themes:

6) Joint promotion of diversity and gender equality (Diversity and Gender Equality)

7) Research-based teaching and learning (Teaching and Learning)

8) Processes relating to strategic internationalization (Internationalization)

To realize these aims, the units involved concluded a cooperation agreement in February 2018. December 2018 saw the partners submit a joint application to the Excellence Strategy titled “Crossing Boundaries toward an Integrated Research Environment” which was granted in February 2019.

As of 1 November 2019, the Berlin University Alliance receives funding of up to 25 million euros per year within the framework of the Excellence Strategy. The alliance’s numerous calls reflect the breadth of its research and its expertise embraces areas such as social cohesion and the advancement of junior scholars, science communication and projects on the psycho-social impact of the lockdowns during the current
COVID-19 pandemic, international research projects conducted with the Global South, and strategic partnerships with the University of Oxford, University of Melbourne and the National University of Singapore.

The focus for 2020 was on setting up and finding staff for the bodies and institutions responsible for implementing the alliance application. The Berlin University Alliance is steered by a board of directors made up of the heads of the participating institutions. TU Berlin is represented by its president. Composed of a member from each of the alliance partners, the Executive Board is responsible for implementing the strategic decisions of the Board of Directors and is tasked with focusing on the coherence of the enterprise. This role is performed at TU Berlin by the vice president for strategic development, junior scholars, and teacher education. Each aim and cross-cutting theme pursued by the alliance is managed by an individual steering committee made up of a researcher from each of the alliance partners. For example, the vice president for research, appointment strategy, knowledge & technology transfer represents the interests of TU Berlin in the objective Fostering Knowledge Exchange. The vice president for education, digitalization, and sustainability performs the same task in the objective Teaching and Learning. The offices, administrative units, and the sections and departments of the participating institutions ensure the implementation of the planned undertakings.

The law establishing the cooperation platform of the Berlin University Alliance as a statutory body under public law (Gesetz zur Errichtung der Kooperationsplattform der Berlin University Alliance als Körperschaft öffentlichen Rechts) came into force shortly before the end of the first funding year. The platform was established with the aim of simplifying collaboration between the researchers and the administrations of the alliance members.

**tubstart2020**

With the aim of emerging stronger from the current international crisis, the president unveiled the program tubstart2020 in June 2020. This seeks to implement the lessons learned during the pandemic and coordinate all strategic University operations.

The program aims to find answers to a range of pressing questions with direct significance for the future: How do we want to work in the future? Which ways of working have proven effective during the crisis? What is the significance of on-campus working practices in research, teaching and administration and what can and should be undertaken in these areas? What sort of a future do we need to prepare ourselves for? Which role will the climate play and what contribution can we make to the reduction of climate change and mitigation of its impact?

It is clear that an increased level of digitalization will play a central role in our future working life. TU Berlin is moving into the future by establishing mobile working practices in as many operations as possible.

Aware of the greater medium-term significance of climate change in comparison to COVID-19, TU Berlin plans to make this issue one of the central areas of focus of the tubstart2020 program. In addition to establishing the Climate Change Center, realized in close cooperation with a number of Berlin and Brandenburg-based partners, we will place a clear focus on the climate-neutrality of our own campus.
2.3 Strategic research centers

Climate Center

Dealing with and mitigating the impact of climate change on society requires a new level of solution-based interdisciplinary and transdisciplinary thinking. This is the aim of the Climate Change Center established by TU Berlin and partners from Berlin and Brandenburg. The center will bring together researchers from a range of different disciplines with practitioners from the field, who will work together to open new areas for action and develop climate-friendly measures. The establishment of the initiative is one result of the Berlin Climate Change Working Group kickoff held in the fall of 2019 and which brought together representatives from government, industry and civil society. The mayor of Berlin, Michael Müller, was also in attendance.

TU Berlin possesses considerable expertise in a number of areas of relevance to climate change, including the transformation of energy systems, new forms of mobility, the bio-economy, recycling, climate-friendly construction and sustainable construction. We are well-placed to make a central contribution to the establishment of an integrated research framework focusing on the many aspects of climate change. Working together with a number of other universities and research institutes in Berlin and Brandenburg with expertise in the humanities, social sciences, political science, biodiversity research, land use or the healthcare sciences, this network has a unique potential to produce developments in this area. The Climate Change Center Berlin Brandenburg is assisted by the Potsdam Institute for Climate Impact Research in its establishment. The director of the Potsdam center, Ottmar Edenhofer, is professor of the economics of climate change at TU Berlin.

The Climate Change Center Berlin Brandenburg is planned as an interdisciplinary and transdisciplinary research and knowledge-transfer center working with representatives from government, industry and civil society to implement the aims established in the Paris Agreement on Climate Change. The Berlin-Brandenburg region provides the researchers involved in the center with a unique urban-rural real world laboratory where their findings can be transferred into practical solutions.

An application for funding to the Einstein Foundation in Berlin is currently in preparation to support the research, teaching and public policy activities of the center and to promote its international networking. The role model in this respect is the Einstein Center Digital Future (ECDF), which was established in 2017 as a public-private partnership. The center is currently looking for funding to enable the establishment of new professorships and projects at the climate center in the four areas society, technology, nature and town and country.

Berlin Institute for the Foundations of Learning and Data (BIFOLD):

Big Data (BD) and machine learning (ML) represent the new technological foundations of Artificial Intelligence (AI) applications. The AI strategy of the federal government has selected Berlin as the location of one of six national AI competence centers. On 13 November 2020, the Joint Science Conference took the decision to establish the center on a permanent basis. The center will receive over 20 million euros of joint funding from both the federal government and the State of Berlin. BIFOLD is currently being established through the amalgamation and expansion of the existing Berlin Big Data Center (BBDC), a recipient of funding from the Federal Ministry of Education and
Research since 2014, and the Berlin Center for Machine Learning (BZML). Working on
the basis of the internationally renowned output of BD and ML research performed in
Berlin, BIFOLD has established itself as an international "lighthouse" with global reach
and a reputation for producing state-of-the-art scientific and technological break-
throughs. It also makes a key contribution to the industrial application of its findings
and supports and promotes the sustainable industrial development of the region.

BIFOLD addresses three areas of focus:

- Scalable data management (Big Data) and machine learning, e.g. learning and
  inference procedures, data mining, data management and data security
- The management of data science processes, e.g. information integration, Big Data
  management, Big Data engineering, information visualization, visual analytics and
  benchmarking
- New AI architectures and systems, e.g. data analysis infrastructures and informa-
  tion marketplaces, highly scalable systems for the Internet of things and industry
  4.0, open source and open data
- Responsible data management and explainable AI, e.g. comprehensible ML, com-
  puter security, securing data privacy and data security and the associated technical
  principles of responsible, ethical data management
- The application of AI in the natural sciences (medicine, physics, chemistry etc.) and
  humanities, innovative ML procedures, deep learning architectures and scalable
  BD methods with the potential for genuinely new scientific insights

Having established a level and form of integration of big data and ML research unique
in Europe, BIFOLD places a clear focus on research into technologies which seek to
increase trust in the use of BD and ML methods. The institute also seeks to increase
the number of people able to set up and use AI applications and ensure the efficient
and resource-saving use of large quantities of data and ML models.

Although BIFOLD is dedicated to performing basic research, its results are implement-
ed directly into specific applications and will make an important contribution to the
innovation and competitiveness of Berlin’s industry and academia. The systems and
processes generated by BIFOLD function as interdisciplinary basic innovations and
generate added value in a range of academic and industrial applications.

BIFOLD will also train the AI experts (ML developers, data engineers and data scien-
tists) urgently required in all innovation areas. BIFOLD attracts a range of internation-
al top talent, who enrich Berlin’s academic ecosystem. The technology and software
artifacts produced by the basic research conducted at BIFOLD flow directly into start-
ups or the activities of the non-university partner facilities via the application-oriented
research conducted in the center.

Einstein Center Digital Future (ECDF)

Strategic cooperation with partner universities and non-university research institu-
tions with the aim of strengthening research and teaching and the establishment of
new research fields have attained increasing significance at TU Berlin in recent years.

The establishment of the Einstein Center Digital Future (ECDF) represents an impor-
tant milestone in TU Berlin’s long-term strategy within its research field of digitaliza-
tion. Since its ceremonial opening on 3 April 2017, this unique alliance project led by
TU Berlin has played host to top-quality research conducted by international scholars
active in its area of core interest Digital Infrastructure, Methods, and Algorithms and
the innovation areas Digital Health, Digital Society and Digital Industry and Services.

The ECDF is the result of a major public-private partnership (PPP) with partners from
industry, academia and government. The undertaking is a joint project involving Charité – Universitätsmedizin, Freie Universität Berlin, Humboldt-Universität zu Berlin and Berlin University of the Arts. The speaker institution is TU Berlin. A number of top-level non-university research institutions (BIH, DLR, FOKUS, HHI, IZM, MDC, PTB, ZIB) as well as Beuth University of Applied Sciences and the Hochschule für Technik und Wirtschaft are also involved in the project together with the Federal Ministry for Education and Research and the Federal Ministry for Labour and Social Affairs and more than 30 companies.

The ECDF is planned for a duration of six years, with the option of further funding up to 31 March 2028. Approval was granted by the Einstein Foundation Berlin (ESB) in September 2016 following a rigorous assessment procedure.

With a budget of more than 38.5 million euros, the ECDF draws its funding from the private sector (approx. 1/3 of funding), the non-university research centers involved (approx. 1/5) and the State of Berlin.

Since its establishment, the ECDF has functioned as an important motor and initiator of the research into digitalization conducted in Berlin. The professorships established at the center have all been designed with an interdisciplinary focus and work at the interfaces with other disciplines. The ECDF is conceived as a cross-university nucleus for the research and promotion of digital structures in academia, industry and society. Rather than establishing new individual initiatives, the ECDF seeks to combine the research into digitalization conducted in Berlin under a single organizational roof, test new forms of collaboration and concentrate on cutting-edge innovative interdisciplinary research and highly qualified young research talent. HEIBRiDS, a joint graduate program launched in 2018 and hosted by the ECDF and the Helmholtz Society in the area of data science, is just one example of the excellent training available for junior scholars.

The work of the ECDF is widely viewed as having ensured success in the acquisition of the Weizenbaum Institut – Research for the Networked Society, funded by the Federal Ministry of Education and Research. These successful initiatives and BIFOLD have enabled the Berlin universities to position themselves at the forefront of digitalization research in Germany.

More than 40 additional ECDF professors have taken up their work at the Berlin universities and universities of applied science – 23 at TU Berlin alone. Each faculty at TU Berlin is represented by at least one professor. Collectively, these professors strengthen the research conducted into digitalization in Berlin and make an important contribution to teaching in this area.

The interim evaluation conducted in March 2019 was an important milestone for the ECDF. The conclusions of the international group of experts commissioned by the Einstein Foundation can be summarized as follows: The appointed professors are extremely well qualified. The center is a model for the establishment and implementation of inter-university collaboration and the development of public-private partnership models has significantly exceeded expectations. The expert group further concluded that the ECDF has established a reputation beyond Berlin, Germany and the academic community. The creative and innovative concept of the center, with its combination of cooperation, interdisciplinarity and independence, promises to be a gain not just for those involved in the project, but for future employers both within and outside academia.

The Einstein Foundation Berlin and the Senate Chancellery for Higher Education and Research place especial value on the long-term presence of the ECDF as a factor in the further development of Berlin as a center of research and development. As such, the Senate Chancellery has committed to establishing 10 permanent ECDF professorships. The recruitment procedure was started in 2020.
Chemical Invention Factory (CIF)

As one of the fundamental scientific disciplines, chemistry has an essential role to play in the development of a sustainable society which meets present needs without living at the cost of future generations. The development of innovative solutions to this problem requires excellent research. TU Berlin has responded to this need with a variety of initiatives, including UniCat (established in 2007), later the Cluster of Excellence UniSysCat (2019) led by TU Berlin and the Einstein Center for Catalysis. Sustainability requires not only the translation of research findings into efficient applications (technology transfer) but social use (knowledge transfer). The Chemical Invention Factory (CIF) was the first innovation center for green chemistry, established to facilitate these developments in what remains a difficult and complicated sector for transfer processes.

The challenges result from the knowledge, research and capital-intensive nature of these areas, the technical infrastructure required, and the long product development cycles involved. To meet these challenges, a new building with a floor space of some 1,000 m² will be built on TU Berlin’s Campus North in immediate proximity to the existing research infrastructure, to provide temporary accommodation for up to 12 teams. These teams will work with partners from industry to turn research results and patents into startups and technology transfer projects. Recent years have seen the Centre for Entrepreneurship (CfE) and the Center for Intellectual Property (ZfgE) work in partnership with all the faculties at TU Berlin to develop a broad understanding and expertise relating to transfer issues. This is applied within an intensive and well-coordinated level of collaboration and supplemented by suitable laboratory facilities and support services specific to the needs of academic chemistry. These have already been developed and tested with chemistry startups within the scope of the IHK-financed pilot project INKULAB.

The Berlin Senate and TU Berlin have invested a total of 10.8 million euros in the new building. The commission was awarded to SEHW Architektur GmbH in February 2021 following an international planning competition and tendering procedure. The detailed planning phase is already underway (see chapter 3.1) and by mid-2024 TU Berlin will possess a unique building whose general-purpose areas and demonstration laboratory will provide a wide range of additional opportunities. TU Berlin seeks not just to promote technology transfer but establish a dialog with stakeholders in civil society to develop new approaches – from research to successful application – for the benefit of the whole of society. Working with fundamental concepts such as the “12 principles of Green Chemistry” and the key concepts of “The Chemistry Revolution” and “Digitalization,” TU Berlin is seeking to produce chemical applications and products and thus tangible experiences open to all.

Center for Research on Antisemitism & Selma Stern Centre

The Center for Research on Antisemitism has undergone a process of considerable expansion over the last four years, thanks both to increased levels of third-party funding and the social relevance of the issues it researches. Staff at the center are involved in countless national and international cooperation projects and are regularly consulted by a range of state and non-state organizations and institutions. They are also involved in a range of exhibition and education projects and maintain a high media profile.

Of especial interest in this area is the center’s involvement in the Federal Ministry of Education and Research-funded alliance project Forschungsinstitut Gesellschaftlicher Zusammenhalt, which started work in the fall of 2020. This project enables the Center for Research on Antisemitism to transcend subject boundaries and contribute its findings in the key areas of antisemitism and racism to social and political science
research within the Federal Republic.

The Arthur Langerman Archive for the Research of Visual Antisemitism (ALAVA) was established to conserve the collection of visual forms of antisemitism assembled by the Belgian Shoah survivor Arthur Langerman and to make these items available to researchers and educators. This is the largest collection of its kind and was donated by Mr. Langerman to the Arthur Langerman Foundation (under the management of TU Berlin) in March 2019.

The Center for Research on Antisemitism is also a partner in the Selma Stern Zentrum für Jüdische Studien Berlin-Brandenburg (ZJS), an alliance project funded by the Federal Ministry of Education and Research (second funding phase 04/2017-03/2022), and is involved especially in eye witness / culture of memory (after) the Shoah. The Selma Stern Zentrum has established itself as an inter-institutional, supra-regional and international research network. 2017 saw the establishment of the “Righteous Among the Nations” research group at TU Berlin as part of the Selma Stern Zentrum post-doc academy. This was extended by the addition of two doctoral candidates in 2018. A post-doc position at the Selma Stern Zentrum was also finalized in 2018 with responsibility for the joint Interdisciplinary Research on Antisemitism degree program. The (initial) findings of the research were presented and published within the reporting period. In November 2020 TU Berlin organized and hosted an extremely successful international Selma Stern Zentrum annual conference, for the first time as a digital event. TU Berlin chaired the Board of Trustees of the Selma Stern Zentrum in 2018-2020. Professor Dr. Schüler-Springorum was speaker of the Selma Stern Zentrum in the academic year 2019-2020, during which it secured the necessary funding for the continuation of its work.
2.4

Budget and strategic staff development

During the reporting period, the consumptive grant rose from 317.8 million euros in 2018 to 344.6 million euros in 2021 - an increase of 26.8 million euros. Within the same time period, the personnel costs calculated for and covered by the grant, i.e. for employees, civil servants, student employees etc., increased by 31.7 million euros from 267.2 million euros to 298.9 million euros. Personnel costs increased by 4.9 million euros and thus above the consumptive grant.

As a budgetary shortfall (pauschale Minderausgabe) of 5.3 million euros had already been recorded for 2017, this shortfall only increased. It currently amounts to 9.9 million euros. This shortfall must be covered within the course of the respective fiscal year by cutting costs. This aim was consistently achieved within the reporting period. Past years have demonstrated the possibility of covering a budgetary shortfall of under 10 million euros without serious reductions in staffing.

Indeed, some 200 new posts were created within the reporting period. Despite this increase, all operating departments at TU Berlin report extreme operative strain and the increase in staffing levels has not been sufficient to cover additional and new tasks. In the past, increases in staffing levels have not always matched the increase in the number of tasks to be performed. This was especially clear with third-party funding. The University has always been able to increase the level of third-party funding which it acquired, but the funding organizations were not prepared to finance the number of administrative personnel required. The projected shortfall restricts the scope for expansion in this area.

Savings in other areas in the budget are almost impossible. For instance, building management costs – electricity, heating, rent, cleaning etc. increased from 44.1 million euros to 51.0 million euros. This represents an increase of 6.9 million euros and a significantly greater increase than the 4.3 million euros of the previous reporting period.

A further point of increasing concern is the maintenance costs for buildings. The costs of equipping offices and labs for newly appointed professors have increased due to increased requirements. This means that other modernization work such as the improvement of sanitary facilities cannot be performed. This issue is to be addressed by a dedicated infrastructure fund (Sanierungsprogramm für die Berliner Hochschulen).

The clear task for the immediate future is the need to obtain funds for the period from 2023 within the scope of the university contract (Hochschulvertrag) negotiations starting in 2021 to reduce the budgetary shortfall for TU Berlin, increase staff numbers to match the increased number of tasks, and obtain sufficient material funds which reflect actual costs.

Strategic staff development

Strategic staff development is based on the strategic aims of TU Berlin and the skills required to implement them. All staff development measures seek to improve

• qualifications,
• skills and abilities,
• levels of motivation,
• work satisfaction
• and the general health of all members of staff.
As a modern organization, TU Berlin is creating the framework conditions, structures, processes and organizational culture to enable both the organization and its staff to realize their potential.

TU Berlin takes a resource-orientated approach to staff development (this assumes that staff possess the requisite potential, knowledge, and skills) based on a holistic three-pillar model oriented towards the three target groups in its personnel (see Fig. 1).

The Academic Senate moved on 18 July 2018 to adopt the concept for the advancement of junior scholars (the first pillar). Chapter 5 “The advancement of junior scholars” provides further detail about this concept and the advancement of junior scholars in general.

On 5 December 2018 the Academic Senate adopted a concept for staff development for permanent academic personnel with a focus on professors and research associates with permanent tasks (the second pillar). This concept seeks to facilitate individual development in the sense of life-long learning. It comprises all areas of academia (research, teaching, self-governance, management and mentoring skills) in order to ensure targeted support for official tasks. Academics are to develop a clear understanding of their role, extend their own scope for action and establish both internal and external networks.

To this end, the Center for Scientific Continuing Education and Cooperation (ZEWK) offers advanced modules (seminars and workshops) for the individual target groups within the scope of its certificate in university teaching. This includes advisory services for permanent academic staff in matters relating to innovative teaching and learning formats and the use of digital tools in teaching. The “Lunch for good teaching” provides a regular opportunity for networking. The ZEWK also organizes work shadowing and coaching services and further skills training through certificate programs in the areas of science communication and research management. Its offers for junior scholars are outlined in chapter 5. The services of the ZEWK can also be used by academic support staff.

To cater to academic support staff (the third pillar) TU Berlin adopted a framework action plan for strategic staff development in June 2019, which corresponds and supplements the University Framework Agreement. Working on this basis, TU Berlin presented its first multifaceted package of measures for strategic staff and organizational development for academic support staff. It serves to

- strengthen the skills and personal development of staff
- secure the recruitment of highly qualified specialists and managers and
- make TU Berlin an attractive employer.

The three pillars of strategic staff development at TU Berlin
Annual staff-management one-on-ones were started within a pilot process in 2018. The rollout of the concept in the TU administration will be completed in 2021. TU Berlin responded to the COVID-19 pandemic with the digitalization of teaching and remote digital working practices. The actual form taken by the measures involved in this response and their implementation were realized and developed through cooperation between

- The Executive Board
- The various university bodies
- The responsible organizational units
- The representatives of the working groups assembled to this end
- All further relevant stakeholders

**The Human Resources Strategy for Researchers (HRS4R)**

The Executive Board also decided on 9 April 2019 to implement the Human Resources Strategy for Researchers (HRS4R). Developed by the European Commission, HRS4R is a process dedicated to improving working conditions and developing opportunities for academics. Established on the basis of the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers, its 40 principles apply to researchers at all career levels and pertain to:

1) Ethical and professional issues
2) Appointment procedures
3) Working conditions
4) Career development and continuing education

TU Berlin has been in the initial phase of the HRS4R project since early 2020, during which an analysis of the status quo and an action plan are being developed. The implementation phase will be launched in summer 2021. TU Berlin uses the HRS4R project to develop its staff development strategy for academic personnel (first and second pillars). This aims to raise the international profile of TU Berlin and recruit the best researchers.

**Family policy aspects**

Certified as a family-friendly university, Technische Universität Berlin seeks to address the multiple challenges posed by work, academic qualification and childcare by taking advantage of the family policy aspects of the Act on Academic Fixed-Term Contracts (WissZeitVG). To this end, TU Berlin issued the circular “Using the family policy aspects of Section 2 (1) sentence 4 WissZeitVG at TU Berlin” for use as procedural regulations on 30 May 2017.

WissZeitVG restricts the period for which an academic can be employed by a university for the purpose of pursuing academic qualifications to six years before and six years after the awarding of a doctorate. The family policy aspects of this law establish that the full period of 12 years can be extended by up to two years for every child under the age of 18 for which the candidate has care responsibilities. This measure is intended to prevent disadvantages arising.

The family policy aspects of this law do not constitute a legal claim but present an option for the extension of a contract subject to the financial resources of the employer. Against this background, TU Berlin has established a positive track record since 2017 in using the family policy aspects of the legislation to make strides in combining career and family for academics (see chapter 10).
Academic study of the employment situation of office and technical staff

Since 2019, the Cooperation Center for Science and the World of Work has been conducting an empirical study of the working and employment situation of office and technical staff at TU Berlin. This study continues the tradition established in 2002 of conducting regular studies into the working situation of academic personnel, providing an analysis of the working and employment situation of academic support staff at TU Berlin in all job descriptions (Central University Administration, the faculty administrations, offices, libraries, Campus Management, laboratories, workshops etc.). The study also incorporates staff members from both university and research management as well as those from the “new university professions” i.e. highly-qualified members of the University administration not primarily active in research and teaching, but who are closely involved in the organization of University operations.

Working with the results of the standardized online survey conducted in February 2020 regarding:
- Working tasks
- Working content
- The organization of work
- The contractual situation
- The experience of the workload
- Continuing education
- Satisfaction

the Executive Board decided in summer 2020 to conduct a total of 40 in-depth guideline-led interviews with active and former members of staff. The majority of these interviews are planned for the first quarter of 2021. Mid-December 2020 saw the presentation of an intermediate report aimed at members of the University; this was presented and discussed within the scope of a University dialog event. This study will conclude with the submission of the final report planned for the end of 2021.

The results of the study will be evaluated and possible measures derived by a project group established by the steering group responsible for the study. This will be composed of members from:
- Staff and organizational development
- Health Management
- Human Resources Management
- The Staff Council
- The Cooperation Center for Science and the World of Work (advisory role)

Health Management

2016 saw the launch of the Health Management Office run by TU Berlin in conjunction with Techniker Krankenkasse. The project is set to run until December 2021 and seeks to provide structures and offers with the aim of:

(1) Promoting a healthy working and organizational structure
(2) Encouraging individual healthy patterns of behavior
In 2017 and 2018, the health management steering group presented the results of a University-wide survey focusing on organizational and working conditions at TU Berlin. Meeting in a number of central and decentral events, the steering group liaised with TU staff about the results of the survey and possible measures to be derived. The steering group worked to develop a range of target group-specific health promotion measures which have been implemented successively since 2018. One measure was a program implemented in 2019 to provide advice and assistance relating to dependency-prevention, cycling safety and the establishment of recovery strategies. 2020 saw the successful transition from on-campus events to a range of digital formats. The steering group reacted to the exigencies of the pandemic situation by providing online seminars on topics such as ergonomic practices when working from home.

The steering group also developed a framework concept for the professionalization of conflict management at TU Berlin. Conflict is an integral part of working life and studies and should be viewed as an opportunity for personal and organizational growth. The steering group’s proposal extends the existing decentral advisory services over the coming years by establishing an Office for Conflict Management. The services of this new office will be available to all members of the University and work towards preventing, identifying and resolving conflicts at TU Berlin.
3

Campus infrastructure & research and communication
3.1 Campus development & construction planning

Campus development and renovation planning

The report on repairs requirements at the 11 state universities in Berlin from 2018 revealed a medium-term requirement for work amounting to 3.2 billion euros, of which 1.1 billion is required by TU Berlin. The authorities requested that the 11 universities draw up a campus development plan to define their requirements more closely. The plans were to envisage a 15-year completion period and outline the annual funding requirements to achieve this. The Senate Chancellery consolidated the 11 plans from the individual universities into a single master plan to form a state campus development and renovation plan, so as to increase the chances of success in the budget negotiations.

Supported by external consultants, TU Berlin established a broad-based committee to draw up a TU-specific campus development and renovation plan to ensure the long-term viability of the Charlottenburg Campus. The TU Berlin construction and modernization strategy addresses acute renovation requirements and includes six independently-realizable lines of action designed to incorporate further aspects of the long-term development of TU Berlin at its current locations. This plan was drawn up in accordance with all the objectives of the Climate Protection Agreement and included sufficient scope to permit reaction to future developments. This makes the development and renovation plan an important instrument to outline the long-term financial requirements of TU Berlin in a clear and transparent manner. The development and renovation plan also identifies and sets out the financial resources required by the measures of modernization and (replacement) construction in a clear and understandable fashion. All future notifications of the requirements for investment must be integrated into or derived from the respective campus development and renovation plan. The starting point and important milestone in the campus development and renovation plan is the modernization of the old mathematics building. In September 2020, TU Berlin was able to demonstrate the need to incorporate this step in the investment plan 2021-2025 and it has been included in the next investment planning round.

Hertzallee and Campus North / East

The Senate has launched a zoning plan procedure within its plan for the development of the campus around Hertzallee north, between Müller-Breslau-Straße, Fasanenstraße, Hertzallee and the railway lines. A preparatory construction evaluation has been performed based on the requirements notified by the various stakeholders. TU Berlin has submitted a requirement of approx. 47,000 m² gross floor area for an “AI tower,” a replacement building for the experimental physics building, and ancillary facilities such as childcare facilities, student accommodation, accommodation for visiting scholars and a science gallery. The eastern site represents the last significant area where TU Berlin can extend the central Charlottenburg campus. The interests of the University are represented in the process by the Executive Board and Department IV.
New buildings for the Institute of Mathematics and IMoS

The new building housing the Institute of Mathematics and the research building financed in accordance with Section 91b Basic Law for the Interdisciplinary Center for Modeling and Simulation (IMoS) will be constructed on TU Campus East as state construction measures by the Senate Department for Urban Development and the Housing. The general planning team began its work following the decision in the competition in September 2017 with construction beginning in 2019. Preparations for construction were made in 2018 with the demolition of the WF, MB, RDH buildings and a container building owned by the Senate. A number of infrastructure measures were completed to improve access to the site. As of November 2020, the budget for construction amounted to 111 million euros for the Mathematics Building and 56 million euros for IMoS. TU Berlin will contribute some 21 million euros for the IMoS research building from its own budget. The IMoS building is scheduled for completion in summer 2022; the Mathematics Building will be completed in early 2024.

Chemical Invention Factory (CIF)

TU Berlin is planning the construction of a pre-startup center for Green Chemistry on Campus North (Marchstraße in Charlottenburg) called the Chemical Invention Factory. Responsibility for construction was transferred to TU Berlin in 2017 and the 7 million euro grant from SIWANA III was confirmed. Laboratory and office space with an area of some 1,000 m² (Nutzflächen 1-6) is planned for the location on Marchstraße, north of the Aeronautics Building. An architectural competition was held in 2019/2020 following a comprehensive requirements planning procedure. A winner was selected in late summer 2020 and the design planning phase began in 2021.

“The Simulated Human” research building

2010 saw Charité – Universitätsmedizin and TU Berlin conclude a strategic partnership agreement to develop a campus for biotechnology and medical technology at a site at the corner of Seestraße/Amrumerstraße. A research building to be shared equally by Charité and TU Berlin will be built on a subarea of the site by 2023 in accordance with Section 91b Basic Law. It will be used by the Simulated Human project dedicated to research into the issue of medical technology and biotechnology. Charité is responsible for the construction work, which commenced in 2020.

Campus opening and restoration of the art installation

The Ionic columns and Borsig Bogenhalle monuments on the main campus underwent a fundamental restoration in 2018/2019. This project was funded by lottery money and a grant from the Senate Department for Urban Development and Housing. The restoration addressed a range of problems which would have impaired the monuments' long-term safety. An information system to provide the historic background of the buildings is currently planned.

Since 2018, the re-design and extension of Hertzallee on the TU Berlin main campus in Charlottenburg has opened up the space to the surrounding area. A first construction stage saw the remodeling of the entrance area on Fasanenstraße up to the crosswalk at the TU canteen. The Senate Department for Urban Development and Housing granted Charlottenburg-Wilmersdorf district authority 1.3 million euros for redevelopment of the extended Hertzallee in conjunction with the work of the “Active Center City West” urban development zone.
Since winter semester 2018, students and teachers at TU Berlin have been working together in interdisciplinary classes to devise ideas for the conception, positioning and design of an exhibition pavilion and the surrounding area on the main campus. A number of knowledge trails crossing the campus will make the area more accessible to a wider public. This also included the redevelopment of the second phase of Herzstraße, which will enable the complete experience of the axis from Ernst-Reuter-Platz over Fasanenstraße to Hardenbergplatz / Bahnhof Zoo. The Senate Department for Economics, Energy and Public Enterprises has committed to providing the requisite funding of approximately 12.5 million euros; the funds should arrive in April 2021; see chapter 8, Climate Protection Agreement and Berlin program for sustainable development (BENE) and chapter 3.3 Charlottenburg Campus.
3.2 Digital infrastructure and services

Campus Management

Seeking to continue the integrative approach begun with the adoption of an SAP system, TU Berlin moved to establish many of its decentralized IT services under the aegis of a single department. Replacing tubIT, the new Campus Management combines the remit, personnel and budgets of tubIT, the IT coordinator and tuKERP. The consistent implementation of an integrative approach facilitates the exploitation of synergy effects, for example in the establishment and operation of support structures (help desk and local support), joint operating platforms (hardware, licenses, machine rooms), and standardized administrative procedures. The previous professorial management structure has been replaced by three management levels: strategic, integrative and operative. See Fig. 2.

The new management structure, which includes the amalgamation of the Campus Management steering committee (LK-CM) and the CIO body, means that TU Berlin is excellently equipped to face new challenges.

Working within the scope of the development of the tubCloud and DFN cloud architecture (outlined in the last report), 2020 saw the renewal and extension of the database and memory system. The University was thus able to extend existing quotas (maximum memory space) and cater to increased requirements generated by a range of factors including remote working and online teaching. The provision of Only Office, which permits the simultaneous editing of Word, Excel and PowerPoint-compatible files directly in the cloud, facilitates collaborative cloud-based working practices. The first DFN cloud instances were run using Kubernet as a dynamic private cloud service.

Preparations for switching the TU Berlin telephone system to a Voice over IP system (VoIP) started in 2018. Rollout of the system began in 2019 with Building E. The rollout will move from building to building; by the end of the changeover, we will have

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Figure 2  The IT infrastructure/ governance structure of TU Berlin
replaced some 8,000 telephones and their numbers. Integration of the TU Berlin IT systems into a centralized communications architecture (combining a traditional telephone system with video conferencing, mobile working, an electronic fax system and other services) will establish shared digital working practices. The rollout will continue over the coming years in accordance with the required network upgrade.

**Enterprise Resource Management System (ERM)**

The campus management project currently running at TU Berlin includes the comprehensive introduction of SAP in what is set to be the largest SAP project in Germany. The project aims to integrate the vast majority of administrative processes in an integrated system, replace a multiplicity of isolated software solutions and develop more effective and efficient processes.

Enterprise Resource Management (ERM) focuses on finance, human resources and research management, the administration of third-party funding, and building and services management. The central modules for human resources, finances and third-party funding were introduced on 1 January 2019. Further processes and modules are currently in the implementation phase or implementation preparation phase, such as e-recruiting and the digitalization of procedures for official travel from registration to accounting.

**Employee Self-Service/Management Self-Service (ESS/MSS)**

Within the ERM project, the human resources subproject is responsible for the implementation of HR-relevant processes in the SAP system (HCM module). The ESS/MSS scenarios (Employee Self-Service/Management Self-Service) describe the operating interfaces with input forms for individual applications which can be operated via the web interface tuPORT.

The ESS app “My proofs of payment” has been online since August 2019. This was followed in March 2020 by “My certificates” and “Outgoing EU country” from SAP Personnel Payroll. Members of staff can use these apps to access their documents and certificates in the corresponding application and print or save them (digitally) and transmit information contained in them.

The following ESS/MSS scenarios from SAP Time Management will follow in the first quarter of 2021 as a pilot phase: “Inbox,” “My team calendar,” “My attendance/leave requests,” and “Planning on-call duty.” These scenarios enable the first step in transitioning procedures required to manage leave and on-call duty into automated workflows, including the process communication between staff and management. Teams from various departments will take part in the pilot project. Following the subsequent evaluation and any optimization, these scenarios will be rolled out in the departments.

The following ESS scenarios from SAP Personnel Administration will go live for all departments in the first quarter of 2021: “My addresses,” “My communication data,” “My official addresses,” and “My bank data.” These scenarios permit staff to access and update their own data at any time. This is to be followed by the following ESS/MSS scenarios in SAP Time Management: “My time booking,” “Swap days in part-time,” “Preliminary notification of sickness,” and “Registration as fit for duty.”

**The Speedikon real estate management system**

TU Berlin is currently engaged in the rollout of the Speedikon® C real estate management system. 2020 saw the finalization of the specialist concept for the Strategic Space Management module and implementation of its functions in Speedikon. The
pilot phase with some 20 users from Faculty V and Strategic Space Management was started at the beginning of 2021. The University-wide rollout will be initiated following a successful pilot phase in summer 2021, and the processes for further modules in Speedikon such as strategic space budgeting, cleaning management, and maintenance will start.

The Alma library management system

The libraries at the four Berlin universities adopted the Alma library management system (from ExLibris) in 2017. This package solution for all stages of media acquisition, cataloging, research and use is based on an innovative cloud-based infrastructure and has resulted in a clear improvement to a number of processes (administration in particular) through the use of electronic resources, a factor which is gaining increasing significance. The integration of Alma in the University SAP system, planned for 2021, will simplify and accelerate invoice processing. The introduction of Leganto in 2021, an Alma-based tool for the management of literature lists, will make an important contribution to the digitalization of teaching. This compatibility serves to underscore the value of Alma as a motor of innovation. TU Berlin is the first university in Germany to deploy Leganto.

SAP Business Intelligence (BI) reporting system

Within the process of introducing a comprehensive SAP system landscape, TU Berlin took the decision in 2017 to deploy innovative technologies (Hana, Business Objects) to revolutionize the approach to providing reports and information for a range of recipients and purposes. The replacement of superX and the introduction of the SAP Business Intelligence (BI) reporting system serve as replacements for the various separate manually managed solutions previously deployed across the University to enable systematic, comprehensive, and standardized reporting. This move was intended to establish a reliable data base providing a high level of user and service orientation; targeted information provision is designed to provide the basis for the operative and strategic management of TU Berlin.

Reporting & data consolidation

Summer 2019 saw the first wide-scale provision of finance and personnel reports for all users. A range of further reports are continually being added, so that since the start of 2021, the end users at TU Berlin can access a large proportion of the reports that they require to perform operative resource management. Larger packages of reports are also being generated for specialist departments; for instance, reports regarding allocation frameworks or third-party funding statistics can be generated at the push of a button. Even if not all the reports saved in superX are available, we have succeeded in overcoming the largest hurdles which inevitably arise during such a complex system replacement. Thus for example, deployment of the reporting system has established an intermediate solution for the issue of authorization so that reports can be made available to end users via the portal in the absence of automated authorization.

In addition to the increase of available reports, data consolidation in the specialist departments assumes a central role. This area requires considerable improvement and coordination, as not all data input or booking processes run smoothly. Automated role issue and training will be implemented in the course of 2021, for which a suitable training system is to be established.

All these innovations required a suitable supporting hardware structure. To this end, two new HANA servers have been commissioned within the scope of the renewal of
the HANA database infrastructure. This will be adapted to the needs of the coming years and seeks to ensure a continual chain of support services for the hardware and software. The old systems are still deployed in the development and test systems; extension of the available memory space and the redundancy will result in the provision of extended services. Further development of the HANA technology means that both database nodes will now provide processing power. Development and test systems divide the load over four smaller machines, which will result in massively increased flexibility, for example with compatibility tests. The process of establishing the new HANA environment will continue until Q3 2021 so that the database migration does not disrupt day-to-day University operations.

Open access policy

The Academic Senate of TU Berlin adopted an open access policy in 2017. The stated aim of the policy is to facilitate access to research findings, permit their use in digital teaching and ensure the application of new methods such as text and data mining. The establishment of an open culture of science in terms of open access publications as well as access to processes and forms of communication poses a significant challenge.

The years 2017 to 2020 saw the University make strides towards establishing open access publishing as a key part of its culture of research. An open access officer was appointed in 2016 to advise the Executive Board on all strategic decisions pertaining to open access publishing. The officer maintains close communications with the University Library, which is responsible for all matters regarding open access publishing. The University Library regularly develops its advisory and service offers so that researchers can obtain high-quality support in all matters pertaining to open access. Members of TU Berlin publish some 2,200 articles in academic journals every year. Roughly 52% of this output was available as open access publications between 2017 and 2020.

The University Library has concluded transformation agreements with important publishing houses, which permit reading access and open access publication (currently with Wiley, Springer and RSC). Supported by the German Research Foundation, the University Library has maintained a publication fund to pay for the fees for articles in open access journals since 2017. 670 open access articles were awarded central financing between 2017 and 2020, part of an upwards trend. A fund was set up in 2018 for the publication of open access books, with 18 books financed by 2020. Moreover, by developing the DepositOnce repository for research data and publications, TU Berlin has established its own open access publication infrastructure. More than 10,000 publications have been published in the repository; some further 1500 are added every year. 73% of dissertations produced at TU Berlin are now published online and accessible to an international audience via DepositOnce. TU Berlin University Press marked its 50th anniversary in 2019. Publishing some 40 new top-quality open-access books every year, its website was revised and updated in 2020.

TU Berlin has also made great strides in the area of open access to cultural data. The TU Berlin Architekturmuseum provides access to 89,500 works in the public domain; the University Library has digitized over 1,800 analog works.

Research data

Research data is the basis of all academic findings and has a long-term significance as resource not only for researchers, but wider society. In 2019 the Academic Senate adopted the TU Berlin Research Data Policy. This sets out the principles for handling research data for all researchers at TU Berlin. The approach can be summarized under the acronym FAIR (Findable, Accessible Interoperable, Reusable) and calls on re-
searchers to save their data in a sustainable fashion, wherever possible as open data to ensure open access.

Researchers can obtain help in research data management from the Research Data Management Service Center (SFZ), a joint service of the University Library, Campus Management and Department V – Research. Since 2012, the Research Data Management Service Center has developed and operated the TU Berlin research data management infrastructure with the DepositOnce repository and the web tool TUB-DMP for the generation of data management plans. The center aims to develop research data management services in such a way as to establish professional data management practices in research operations as a matter of course so that researchers are not required to expend any time or resources on infrastructure or tools.

A help desk and advice services have been set up to supplement technical services. A research data management independent learning course has been available as an e-tutorial since 2020. Working on the basis of a survey of researchers conducted in 2020, 2021 will see the start of further discussions of the resources and structures required to guarantee permanent basic research data management at TU Berlin.
3.3 Science communication & science and art/culture

Science communication

TU Berlin has expanded its science communication strategy since 2017. This includes the web relaunch. The new TU Berlin website went online on May 2020; it features a new design and a new information architecture. Up-to-date information as well as the organization and brand values of the University are depicted in a user-oriented and responsive manner. Our approach allows content from our social media channels to be integrated into the website and provides access to a growing media database and an online events calendar. This makes it possible to communicate important issues relating to the University in an attractive manner. TU Berlin also presents itself as an employer and offers quick access to its job advertisements. We are now able to present important issues to prospective and current students in an integrated fashion and present individual degrees programs in uniform profiles. The TU Berlin website is in German and English. The relaunch required not only an overhaul of the online design but also its integration into a new corporate design for all communications including printed material and letterheads.

The second pillar of our science communication strategy consists of communication campaigns focusing on both the University and its research. The Office of Communication, Events and Alumni supported the establishment of the Einstein Center Digital Future with a range of communication services and made a central contribution to establishing its international reputation. Similar campaigns were implemented for the related issues of climate protection, sustainability and Fridays for Future. The campaigns aimed at underscoring the value of science for ordinary citizens and reflected the TU Berlin mission statement: “We’ve got the brains for the future. For the benefit of society.”

The third pillar of the strategy is centered around providing comprehensive continuing education in the area of science communication. New offers were established within the collaboration between the Office of Communication, Events and Alumni and the Center for Scientific Continuing Education and Cooperation (see chapter 7.5). Researchers now have access to a three-stage qualification process: certificate courses in science communication, science marketing and a continuing education master’s degree program in science marketing. The TU Berlin science marketing strategy is organized by tubs GmbH; its range of offers is exemplary for Germany. The qualification in science communication is also viewed as a measure of quality assurance and presents a further professional opportunity for junior scholars at TU Berlin.

Reflecting on science communication constitutes the fourth pillar of this strategy. A success in this area was achieved with the joint acquisition together with the Fraunhofer-Gesellschaft of the Federal Ministry of Education and Research third-party funded Transfer Research project, focusing on science communication. This was preceded by involvement in the conception of the science communication section of the (successful) application by the Berlin University Alliance to the Excellence Strategy.
Communication during the pandemic

The COVID-19 pandemic established internal communication as a key focus of the activities of the Office of Communication, Events and Alumni. This included: supporting the strategic communication of the TU Berlin crisis committee, publishing and distributing information letters, and creating a coronavirus portal on the new website as well as the large-scale social media campaign #TUgetherAtHome to foster solidarity and identification with TU Berlin when working at home. This represents the cornerstone of a TU Berlin internal communication strategy.

Hybrid platform

The hybrid platform is a unique example of science communication. Established 10 years ago as a joint project platform by the Berlin University of the Arts and TU Berlin within the framework of the Charlottenburg Campus, the hybrid platform serves as an international model for the interdisciplinary and institutional networking of art, science and technology. Taking a central role since 2017 in the establishment and program design of the Berlin Open Lab, it initiated the Design and Computation degree program, successfully guided the Shaping Space Excellence initiative into its second round and established cooperative partnerships with Schering Foundation and Futurium. The platform reached more than 12,000 viewers in 50 events in just under four years and also organized a number of publications, workshops and lectures at events such as the 12th Forum Wissenschaftskommunikation. The hybrid platform supported over 100 initiatives, projects and applications within this period. Up until mid-2018, TU Berlin was represented on the hybrid platform project management team by the heads of the Research Department and the Audio Communication Group. Since the end of 2020, responsibility for management of the project has been shared by the Collaboration of Science and Art / Culture unit in Strategic Controlling and the Audio Communication Group.

Science Gallery

November 2020 saw TU Berlin join the Science Gallery Network. Consisting of nine universities, the network seeks to develop new models of science communication located at the interface between art and science. Science Gallery Berlin organizes exhibitions, lectures, events and other educational programs to address pressing social problems. Its work establishes it as a platform to disseminate the findings of cutting-edge research into society. By addressing persons aged 15-25, Science Gallery Berlin seeks to target future managers in science and art.

Charlottenburg Campus

Established 10 years ago, Charlottenburg Campus is a network of twelve interdisciplinary cooperation partners located around Ernst-Reuter-Platz. Charlottenburg Campus is intended as a research and development campus where TU Berlin collaborates with partners from science, art, industry and government. Charlottenburg Campus is a nationally and internationally registered word and design mark and one of eleven “future locations” set up by the State of Berlin since 2019.

The network hosts a range of cooperation projects with the aim of increasing the attractiveness of the location. One example is the re-purposing of Steinplatz in 2018 as an accessible, attractive space for hosting public events focusing on issues of importance for the future. The plan for remodeling the square was developed as part of a student project selected from a number of entries to the competition “Steinplatz meets Campus” which attracted proposals from students at both UdK and TU Berlin.
A further example of a successful infrastructure measure initiated by Charlottenburg Campus is the application for opening up the TU Berlin campus to the surrounding area, which was submitted in 2018 and is set to be implemented in 2021. Working within the framework of these measures, the University plans to establish an exhibition pavilion and knowledge trails on the central TU Berlin campus (see chapter 3.1).

TU Berlin expects further ideas for the re-design of the campus from the first joint master’s Design & Computation degree program run between TU Berlin and UdK. Following a new staff appointment at TU Berlin in February 2020, focus has been placed on reactivating the network and establishing the location development and profile along the interdisciplinary issues of sustainability and knowledge and technology transfer.
4

Research & transfer
4.1 Strategies for excellent research

Collaborative Research Centers

Established for up to 12 years, Collaborative Research Centers have a high strategic importance for the institutional focus and structural architecture of the University. The coordination and concentration of personnel and resources in the applicant universities resulting from the establishment of these centers enable long-term innovative, demanding and complex research projects. As a beacon of excellent research, Collaborative Research Centers play a key part in TU Berlin’s research strategy. As such, TU Berlin’s research strategy places a key focus on the promotion, expansion and retention of Collaborative Research Centers.

TU Berlin currently maintains five Collaborative Research Centers with a total funding volume of 12.8 million euros (as of October 2020). This number corresponds to the number of spokesperson Collaborative Research Centers at the start of the reporting period (July 2017). With six alliances, this number was a little higher for the years 2018 and 2019. The number of Collaborative Research Centers acquired by TU Berlin over the long term places it in a very good mid-table position in a comparison of leading German technical universities, though this needed to be readjusted somewhat at the start of 2020 due to the ending of funding for a project.

Seeking to strengthen the research capacity of TU Berlin in this area between 2018 and 2020, the University drew up a Collaborative Research Center strategy for the period 2020-2025. Adopted by the Executive Board in June 2020, the new strategy for the funding of existing and future Collaborative Research Centers pursues the following aims:

• Set incentives to benefit fully from the advantages presented by the funding instrument without placing an undue strain on the University structure

• Extend freedoms for application submissions, so as to strengthen the framework conditions for applications

• Create offers conceived as supporting services

The strategy is financed by the TU Berlin internal research fund and additional funding from the Executive Board and builds on existing measures of research support as well as targeted support for Collaborative Research Center initiatives. Building on this basis, draft proposals for five Collaborative Research Centers are currently in planning. We expect TU Berlin to acquire two or three new Collaborative Research Centers by 2025.

The highly promising Collaborative Research Center initiatives are currently being supported by measures from the new Collaborative Research Center strategy. A draft proposal for one of these initiatives was submitted to the German Research Foundation (DFG) in 2020/2021. The submission of a second outline is planned for the end of 2021. A third initiative plans the repeat submission of a revised proposal which was unsuccessful in the first attempt.
Committee for Ethics in Research (KEF)

The Executive Board took the decision in 2020 to establish a Committee for Ethics in Research. The establishment of this committee followed a recommendation issued by the German Research Foundation and Leopoldina, focusing on the freedom and special responsibilities of academia. The committee has been tasked with developing principles of ethical research and their evaluation. In so doing, TU Berlin wishes to raise awareness of the possibility of and issues surrounding the misuse of research findings and to minimize the risks resulting from conducting research, without disproportionately circumscribing either its freedom or the use of its findings for peaceful purposes and the benefit of society.

As one of the central bodies established to advise the president, the committee is responsible for general questions of ethics and drawing up guidelines in this area. It has been assigned a range of tasks, including the evaluation of dual use questions pertaining to ethics and technology research, IT research and individual cases of biochemical research; the evaluation of the legal requirement for TU Berlin to remain an institution of non-military research; the evaluation of individual cases affected by export control procedures; and the evaluation and generation of recommendations in individual cases of considerable difficulty, which cannot be addressed in the faculties' own ethics committees.

This committee is made up of nine members. Two are external appointments, one of which is usually an international appointment. Members should represent various status groups and a range of research disciplines; non-voting consultants may also sit on the committee. The president appoints the members for a period of four years (two years in the case of students). The committee started its work at the start of February 2021.
### 4.2 Research funding & the acquisition of third-party funding

**Successes in the acquisition of third-party funding**

After a slight decrease in the years 2015 and 2016, the proportion of expenditure covered by third-party funding registered a continual increase in the reporting period since 2017, reaching 188.5 million euros in 2019. This positive development was highlighted by the acquisition of successful lighthouse projects from the German Research Foundation collaborative research program. For example, the reporting period saw a third round of funding for a number of Collaborative Research Centers for which TU Berlin is speaker; an additional such center started its work in 2017 and is about to submit an application for a second funding phase. Funding was granted to the research group 2402 "Rough Paths, Stochastic Partial Differential Equations and Related Topics" (Prof. Dr. Peter K. Friz) for a second funding phase in 2019; the research group 3033 "Dimensions of Technology in the Arts" (Prof. Dr. Magdalena Bushart) was awarded its next round of funding in 2020; and the research group 2736 "New Refined Observations of Climate Change from Spaceborne Gravity Missions NEROGRAV" (Prof. Dr. Frank Flechtner) was awarded renewed funding in 2018. TU Berlin was able to celebrate a success of truly outstanding significance in the establishment of the Einstein Center Digital Future, funded since 2017 by the Einstein Foundation Berlin, and the acquisition in 2020 of project funding for the Werner von Siemens Centre for Industry and Sciences (WvSCIS) together with Siemens AG and further project partners from Investitionsbank Berlin. In addition to these prestigious projects, TU Berlin also acquired funding for a range of undertakings financed by various federal ministries (see chapter 2.3).

![Figure 3](image-url)

**Figure 3**
Third-party funding expenditure (million euros), incl. funds forwarded to project partners

<table>
<thead>
<tr>
<th>Year</th>
<th>Federal</th>
<th>Public (state/other)</th>
<th>DFG</th>
<th>EU</th>
<th>Private</th>
<th>Endowments (Einstein, VW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>56</td>
<td>55</td>
<td>54</td>
<td>56</td>
<td>11</td>
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</tr>
<tr>
<td>2015</td>
<td>55</td>
<td>55</td>
<td>54</td>
<td>56</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>2016</td>
<td>54</td>
<td>54</td>
<td>56</td>
<td>56</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>2017</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>2018</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>62</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>2019</td>
<td>67</td>
<td>67</td>
<td>67</td>
<td>67</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

- Federal
- Public (state/other)
- DFG
- EU
- Private
- Endowments (Einstein, VW)
In addition to alliance projects, the ever-increasing number of individual projects with third-party funding acquired by TU Berlin and which constitute a basis for large alliance projects pays testament to the breadth of TU Berlin’s research profile.

Internal TU research funding

TU Berlin deploys internal research funding to support the acquisition of collaborative research projects and individual projects: The period 2017 to 2021 saw a total of 141 grants of internal start-up funding for externally funded projects. The current ratio of invested funds and acquired third-party funding is approximately 1 to 4.

The internal calls of internal TU research funding also serve to sharpen the profile of TU Berlin. Working within the framework of the strategic call “Citizen Science” (2018), four projects were awarded funding from a total of 23 applications with the aim of strengthening this participative approach. Working within the framework of the strategic call “Pro Sustainability” (2020), seven research projects (from 26 applications) were implemented as a contribution to the overall concept of the sustainable university. The focus was placed on inventions and new cooperations.

Attracting 49 applications, two infrastructure calls (2018 and 2020) awarded funding to 22 applications for improved and modernized equipment. This program sought to improve the chances of success for future research applications made by TU Berlin.

The dialog platform established in 2017 developed innovative formats for the structured project development of alliance projects (from generation of the idea to the application) such as the ideation conference “Digitalization and Sustainability” (2018) and over 70 method-led workshops.

The findings of a comprehensive survey of the target groups conducted in 2020 confirmed the direction taken by the internal TU research funding program and identified details which are currently being used to develop it further.

The Excellence Strategy

TU Berlin and its partners from the Berlin University Alliance emerged successful in the Excellence Strategy application process. After an intensive internal quality assurance process, an initial set of seven initiatives were submitted to the German Research Foundation in April 2017 within the scope of the first funding line for Clusters of Excellence. These eventually led to four full applications and funding to establish three Clusters of Excellence. The three clusters Unifying Systems in Catalysis, Science of Intelligence, and MATH+ started work in January 2019. This success was continued within the scope of the second University of Excellence / Excellence Alliance funding line where TU Berlin and its partners were the only successful alliance.

University rankings

TU Berlin has established itself in the major international university rankings such as:

- THE (Times Higher Education) World University Ranking
- QS (Quacquarelli Symonds) World University Ranking
- RUR (Round University Ranking)

Sixteen areas at TU Berlin featured in the top echelons of the various university rankings during the period 2018-2020. The leading compilers of university rankings have refined their methodologies over recent years, diversifying their business model to focus on rankings by subject and reputation rankings (e.g. employer reputation). TU
Berlin achieves regular success in the employer reputation surveys, reaching position 69 worldwide and position 5 for Germany in the THE Global University Employability Ranking and position 98 worldwide and position 4 for Germany in the QS Graduate Employability Ranking.

Selected research prizes and awards

Funding from the Alexander von Humboldt Foundation can be viewed as a measure of the level of internationalization of German universities. With a total of 150 funded researchers (29 prize winners and 121 scholarship holders), TU Berlin is placed fourth (weighted) in the Alexander von Humboldt Foundation 2020 Ranking (seventh in absolute terms).

European Research Grants (ERC) are awarded in the categories Starting (StG), Consolidator (CoG) and Advanced (AdG), as well as Proof of Concept (PoC) of a previous grant. In the reporting period, TU Berlin acquired a Starting Grant (Begüm Demir 2017), a Consolidator Grant (Maria Rentetzi 2017), two Advanced Grants (Peter Bürgisser 2017 and Giuseppe Caire 2017), and a Proof of Concept (Dirk Schulze-Makuch 2019), see chapter 6 for further information.

Eva N. Paton was appointed as Heisenberg Professor for Ecohydrology and Landscape Evaluation. This post was renewed in 2017. 2017 saw mathematician Christian Stump win a Heisenberg scholarship. Sociologist Isabell Stamm has been researching entrepreneurial group dynamics since 2017, funded by a Freigeist Fellowship from the VW Foundation. Four Emmy Noether junior research groups were established at TU Berlin during the reporting period: Timo de Wolf 2017 (mathematics), Johannes Teichert 2017 (chemistry), Markus Brill 2018 (computer science), and Anna Pappa 2019 (computer science).

TU researchers were also elected to the most important German academies: nine in acatech, three in BBAW, and one in Leopoldina.

Two researchers from TU Berlin won a junior scholars prize in the "Wissenschaftspreis des Regierenden Bürgermeisters": the mathematician and physicist Myfwany E. Evans (2017) and the physicist Steve Albrecht (2019), who was appointed to a joint post at TU Berlin and HZB. The exigencies of the COVID-19 pandemic meant that the result of the 2020 prize was unknown at the time of publication of this report.

In 2020 the highly prestigious Umweltpreis der Deutschen Bundesstiftung Umwelt (DBU) was awarded to climate economist Ottmar Edenhofer. Professor Edenhofer is a joint appointment of TU Berlin and Potsdam Institute for Climate Impact Research.

TU Berlin is very proud to announce the award of the highly prestigious Wilhelm Leibniz Prize for 2021 to telecommunications researcher Giuseppe Caire. Professor Caire becomes the latest researcher at TU Berlin to be awarded this prize.
4.3 The TU Berlin transfer strategy

The development of a transfer strategy for TU Berlin involves a number of stages including a comprehensive survey of all transfer-relevant activities. A range of activities were started during the reporting period to this end, including workshops involving a range of stakeholders from both the central and decentral areas of the University, the establishment of a transfer committee to advise the Executive Board, and the Stifterverband transfer audit. To be presented in the course of 2021, the TU Berlin transfer strategy will bring together and intensify all the activities currently performed in five areas of action / transfer dimensions, with the aim of making transfer a core activity and integral part of research and teaching at the University.

The transdisciplinarity strategy

2020 saw TU Berlin make considerable advances in the implementation of its transdisciplinarity strategy. National networking in this area was strengthened by the planning of the specialist conference “The institutionalization of transdisciplinarity in universities” (postponed from March 2020 to June 2021) initiated and hosted by TU Berlin. The transdisciplinary undertakings of TU Berlin have raised its profile within the ENHANCE network of European Universities; the University will continue with its focus in this area. The issue of transdisciplinarity has also played a key role in TU Berlin’s transfer strategy since its inception in 2018. In combination with other aspects of participative research, it constitutes the transfer focus research with society / academia science and society. The inclusion in 2020 of all the important units at TU Berlin in this common working structure will facilitate closer links with civil society.

More than 40 transdisciplinary projects at TU Berlin were scheduled to present their work at the Co:Lab conference in March 2020. Just under 200 people had registered for this popular event, making its cancellation as a result of the COVID-19 lockdown all the more disappointing.

TU Berlin is part of the Berlin University Alliance (BUA) established within the Federal Excellence Strategy. Inclusion of the structures and expertise of TU Berlin in this alliance has given it a clear transdisciplinary orientation. An important subproject of the BUA Knowledge Exchange, the research fora, are managed at TU Berlin within the transdisciplinarity strategic project.

2020 saw intensive involvement of the strategic transdisciplinarity project team in the conception and transdisciplinary orientation of the Berlin-Brandenburg Climate Center which is currently being established.

Living lab strategy/urban transformation

Funding from CityLab Berlin enabled the establishment and start of the transdisciplinary pilot project “Stadtmanufaktur Neu-Hohenschönhausen” at the end of 2019. This initial project culminated in the establishment of a central platform for TU Berlin’s living labs and a joint location for living lab research in Berlin. An urban transformation officer was appointed in May 2020 with the task of establishing a long-term “Stadtmanufaktur” platform. Within the scope of an initial survey conducted in January 2020, 40 living labs and living lab initiatives were identified at TU Berlin and networked.

A multi-day workshop was run within the “Climate and City” research forum in November 2020. Representatives from industry in the district, associations, local residents,
academics and further stakeholders from the area surrounding the Charlottenburg campus were invited to develop a shared vision for a climate-friendly Charlottenburg campus living laboratory. This work is set to continue in 2021. At the same time, work began on the development of a digital table for the development of transdisciplinary scenarios for a climate-friendly campus. This will be made accessible from March 2021 as a working area and exhibition maintained by TU Berlin and its civic partners.

Two films focusing on transdisciplinarity

Working together with two media agencies, TU Berlin is currently engaged in the production of two films focusing on the topic of transdisciplinarity. One film addresses the question “What is transdisciplinarity” and provides an accessible explanation of this topical issue. A second film seeks to motivate researchers to try out and adopt this form of research. The second film takes the successful TU project “Taste!” as an example to explain the differing roles played by researchers and praxis partners and establish the value and even fun nature of this type of research. Both films have a running time of 4-5 minutes, are freely available and are designed for use in TU Berlin’s PR strategy. They seek above all, to develop a common understanding of this issue within various stakeholder groups. The films will also be deployed within the scope of the Berlin University Alliance.

Technology transfer

At the end of the reporting period, the active patent portfolio of TU Berlin consisted of over 680 applications or granted patents. The following table gives an overview of the figures and the number of applications claimed or granted and the development of the patent applications:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of applications</th>
<th>Of which are freely available</th>
<th>Preclaims</th>
<th>Claims</th>
<th>Grants</th>
<th>Priority applications</th>
<th>National and international patent applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>70</td>
<td>42</td>
<td>28</td>
<td>53</td>
<td>16</td>
<td>19</td>
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<td>15</td>
<td>50</td>
<td>14</td>
<td>19</td>
<td>157</td>
</tr>
<tr>
<td>2018</td>
<td>46</td>
<td>30</td>
<td>16</td>
<td>36</td>
<td>10</td>
<td>17</td>
<td>103</td>
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<td>11</td>
<td>49</td>
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<td>20</td>
<td>92</td>
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<tr>
<td>2020</td>
<td>66</td>
<td>63</td>
<td>3</td>
<td>33</td>
<td>23</td>
<td>17</td>
<td>71</td>
</tr>
</tbody>
</table>

The number of R&D agreements concluded by Research Contracts, Patents and Licenses increased during the reporting period. Negotiations in this area continue to focus on the establishment of clear regulations for dealing with inventions and patents as well as freedom of research and publication. One clear development however was the increasing significance of open source software and regulations for the use of data.

A further 43 sustainable usage agreements were also concluded in the reporting period, the majority of which were sustainable purchase agreements with national and international industrial partners, license and software license agreements, and options for startup partnerships with TU Berlin.

The number of agreements concluded also meant an increase in the usage income of TU Berlin, although comparison of the individual years reveals fluctuations. Thus 2016 saw the generation of 308,912 euros which increased in 2017 to 583,618 euros;
these figures declined successively in the following years, only rising to the high point of 540,000 euros in 2020.

At the same time, expansion of the patent portfolio resulted in an increase in expenditures from 420,000 euros in 2016 to an unusually high level of approximately 650,000 euros in 2020. The increase in expenditures resulted from the growth of the patent portfolio of about 400 patent applications or issued patents at the start of the reporting period to more than 680. An unusually high number of evaluation reports and patent issues in 2020 (a total of 110), especially those in Europe, which require subsequent validation, account for these increased costs.

Export controls

During the reporting period TU Berlin became one of the first universities in a German-speaking country to implement internal export controls. In so doing, TU Berlin has adopted a leading role among academic institutions in implementing the specifications of foreign trade law. This is in keeping with the responsibilities of a dynamic university of excellence with an increasing international orientation and takes into account the general tendency in legislative practice for the promotion of a culture of compliance.

In 2019 TU Berlin became one of the first German universities to appoint a central export controls officer. Tasked with the development of an internal TU export control and foreign trade organization and the establishment of effective control standards, the officer will process export control procedures, raise awareness of this issue amongst researchers and provide advice to researchers and the Executive Board at TU Berlin in all questions relating to foreign trade legislation. They will also work with the Berlin customs authorities in the foreign trade audit process.

The express commitment of the Executive Board to support the implementation of this internal export control system represents the necessary foundation for university excellence, the maintenance of modern compliance standards, the shouldering of ethical responsibility and the reliable appraisal of academic action in a global context. This also ensures that TU Berlin retains its reputation as a reliable expert partner in academia, industry and government.
5
The advancement of junior scholars
During the reporting period, TU Berlin developed the structure and content of its strategy for the advancement of junior scholars. Measures were taken on the basis of the TU Berlin concept for the advancement of junior scholars, adopted by the Academic Senate on 18 July 2018. The concept for the advancement of junior scholars is embedded in the TU Berlin staff development strategy and was developed as part of a participative process involving all the relevant stakeholders in the faculties as well as those working in the advancement of junior scholars in the central university administration. It builds on the successes of the initiative for Post Graduate Education at TU Berlin (PGE@TUB). Developed in 2018 within the framework of a cross-faculty initiative launched by the Executive Board, PGE@TUB is intended to concentrate and expand the established and successful structures designed for the advancement of junior scholars in all target groups, establish a modern, transparent and University-wide qualification framework, and develop participative measures designed to advance the position of junior scholars in the areas:

- Research
- Teaching
- Academic self-governance
- Project management

PGE@TUB also seeks to provide professional advice to junior scholars in all phases of the qualification process and generate opportunities to qualify for a wide range of careers both within and outside academia. This includes the structural networking of the various services within the Berlin University Alliance and the establishment of joint quality standards in research and teaching, above all to provide doctoral students with high-quality qualification and continuing education opportunities in Berlin as an excellent location of academic training. Berlin's universities increasingly view the advancement of junior scholars as a joint undertaking to be expanded and developed under the aegis of the Berlin University Alliance.

The concept is to be implemented based on the advancement of junior scholars action plan 2019 – 2021, which was adopted by the Academic Senate on 17 July 2019. A participative approach to the generation of an action plan was ensured through the previous establishment by the Academic Senate of the advancement of junior scholars working group. In light of the COVID-19 pandemic in early 2020, the Academic Senate and the faculties agreed to extend the duration of the action plan (2019 – 2020) for a further year until the end of 2021.

In addition to the extension of opportunities for further qualifications, the plan includes measures to optimize the structures for the advancement of junior scholars. A range of further measures have also been adopted with the aim of:

- Strengthening and developing the culture of academic supervision
- Improving the culture of welcome
- Optimizing networking opportunities for junior scholars
- Optimizing information flow in the area of the advancement of junior scholars
- Internationalization
- Specifically promoting women junior scholars

The implementation process will be accompanied by a continual, centrally-managed monitoring program supervised by the vice president for strategic development, junior scholars, and teacher education.

Clear success was achieved in the measures supporting the advancement of junior scholars, including the round tables for the advancement of junior scholars initiated by
the vice president for strategic development, junior scholars, and teacher education in winter semester 2018/19. Within the framework of the rollout planning for the junior scholars concept, the round tables serve to integrate the target groups in a dialog focusing on the development of proposals for the advancement of junior scholars. They now assume the tasks of ensuring constant exchange and networking between

- Junior scholars
- The Central University Administration
- The Executive Board

The recently established Young Academics Network (YAN), a networking initiative for junior research group leaders and junior professors at TU Berlin emerged from the work of the round tables, which since winter semester 2019/20 were themselves involved in the implementation of aspects of the advancement of junior scholars action plan 2019 to 2021.

Establishment of the TU Berlin Center for Junior Scholars (TUB-CJS)

The move to optimize the structures created for the advancement of junior scholars at TU Berlin was also made in response to the challenges presented by the establishment of the Berlin University Alliance and the need to develop structures similar to those already in place at the other Berlin universities (the Humboldt Graduate School, HU Berlin; Dahlem Research School, FU Berlin). Decisions by the Academic Senate (04.03.2020) and the Board of Trustees (03.04.2020) established a new central organizational unit for the advancement of junior scholars in early 2020: the TU Berlin Center for Junior Scholars (TUB-CJS).

The new center focuses on supporting the faculties in their activities designed to advance the careers of junior scholars. The TU Berlin Center for Junior Scholars also supports the strategic development of the advancement of junior scholars at TU Berlin and serves as a central point of contact for junior scholars at the University.

The predecessor organization TU-DOC – Office for Doctoral and Postdoctoral Services as well as the ProFil program – a cross-university program run by TU Berlin, FU Berlin and HU Berlin located at TU Berlin aiming to advance the position of women in research and teaching – were incorporated in the new center.

The TU Berlin Center for Junior Scholars is led by the head of the Center for Scientific Continuing Education and Cooperation (ZEWK) at TU Berlin.

Continuing education program for junior scholars

The continuing education provided by the Center for Scientific Continuing Education and Cooperation (ZEWK) enables doctoral students, post-docs and newly appointed professors to acquire further qualifications in the areas:

- Teaching and learning
- Research management
- Work and management techniques
- Science communication

The program was substantially developed from 2017 to 2020, and the curricula in the four areas were adapted to the various career stages and paths of a skills model developed for this purpose in 2018.
The research management and science communication certificate programs were rolled out in 2020. The tried-and-tested university teaching certificate was supplemented with the international version “Teaching in English – Basic and Advanced Courses.”

Graduate program

TU Berlin has continued its success in the acquisition of research training groups and other doctoral programs, both independently and in cooperation with other universities and research institutions. During the reporting period, TU Berlin was speaker of a total of ten German Research Foundation-funded research training groups, three of which started work between 2018-2020. Professors from TU Berlin are also involved with six further research training groups. The majority of the Collaborative Research Centers / Transregios (TRR) with a TU Berlin speaker and the UniSysCat, Sciol and Math+ clusters also comprise an integrated graduate program. In addition to the current Berlin International Graduate School in Model and Simulation based Research (BIMoS), TU Berlin joined forces with FU and HU in 2019 to form the Berlin School of Optical Sciences and Quantum Technologies (BOS.QT) which has secured funding from the Joachim Herz Foundation until 2024. The involvement of TU Berlin in a total of 17 Innovative Training Networks of the EU Marie Skłodowska Curie Actions represents a further success.

The Berlin University Alliance’s Berlin Graduate Studies Support has provided all TU Berlin doctoral candidates with a qualification program since 2020, which reflects the various phases of a doctorate. The program comprises five core events:

1) A retreat for new doctoral candidates
2) A good research and research integrity conference
3) A writing week
4) Blended learning events focusing on mental health and resilience
5) A career development day (an orientation event for doctoral students focusing on their career development with advice services and talks from alumni).

All five core events were conducted in 2020.
6 Appointments
6.1 Strategies & structures

62 new professors started at TU Berlin during the reporting period. 38% of these new appointments were women. TU Berlin thus increased the proportion of women professorial appointments by 8% in comparison to the previous reporting period. TU Berlin was also able to acquire three Einstein professorships.

The establishment of Appointments and Strategic Cooperations at the end of 2018 brought together all units in the University administration concerned with professorial appointments. The office acts as the central point of contact for all issues relating to professorial appointments, including joint appointments, ad personam appointments, tenure track appointments, and appointments made in connection with special programs.

Appointment regulations

The Academic Senate adopted the statute regulating the appointment of professors and junior professors (appointment regulations) in January. This statute establishes the principles, structures and procedures for the appointment of professors and junior professors at TU Berlin and was published in Official Gazette no. 2/2019.

The guidelines for conducting appointment procedures provide recommendations and information. The guidelines were developed in close consultation with the faculties and are based on the legal requirements of the appointment procedure and a range of further laws and regulations. They guide the reader through the individual stages of a professorial appointment, starting with application for approval of a professorship up to the negotiations with the successful candidate. They provide a range of important information pertaining to fairness, transparency and conflicts of interest, and make recommendations on how to deal responsibly with applicants and ensure gender equality and equal opportunities.

Joint appointments

The instrument of joint appointments has considerable academic potential and innovative power and reinforces academic excellence by strengthening networking between university and non-university research. Serving to align and complement the research strategy of these two types of institutions, the resulting cooperation produces synergy effects such as shared applications for third-party funding, shared access to special research infrastructures, the advancement of doctoral students and junior scholars, and the development of regional skills networks and clusters. The special research profile of the professorships also enriches university teaching. Joint appointments also contribute to the achievement of the aims agreed between the federal government, state governments and research institutes laid out in the Research and Innovation Pact.

Working within the scope of the pact, TU Berlin cooperates successfully with more than 34 institutions, in particular the Fraunhofer-Gesellschaft, the Helmholtz Association, the Leibniz Association, the Max Planck Society and a range of other research institutions such as those run by the federal government.

Over 70 contractually-agreed joint appointments with non-university research institutions, a further 16 agreements relating to new joint appointments, and a total of 20 joint professorial appointments were concluded during the reporting period.
Active Recruitment

Active Recruitment provides advice and support to faculties in both researching and contacting potential candidates for a professorship. The aim is to increase the number of highly qualified applicants and international applicants for positions at Technische Universität Berlin. Research is conducted in a systematic and targeted fashion in consultation with the faculties. Candidates are identified on the basis of the job posting and their qualifications. Active Recruitment then contacts them proactively, encouraging them to apply for the post with which they have been matched. Applicants identified in this way then take part in the appointment procedure in the usual manner.

Working within the scope of a pilot phase funded by the Berlin Quality and Innovation Initiative (BQIO 2016-2020), Active Recruitment was set up in July 2018 on a project basis and integrated in Appointments and Strategic Cooperations. A pilot phase based on an evaluation of the decentral and central recruitment structures tested the active recruitment concept. 21 procedures, comprising 15 W3 professorships, five W2 professorships, one W1 professorship (of which two were joint appointments), two endowed professorships and one tenure track professorship were supervised during the reporting period. Of the 64 actively recruited applicants, 18 were invited to interview and two were placed on the appointment list. The sustained high level of demand from the faculties for the services of Active Recruitment and its success in identifying suitable candidates led the Executive Board to take the decision on 1 January 2021 to establish this office on a permanent basis.

ERC strategy

The ERC strategy started in mid-2017 with the following aims: 1) Doubling the number of ERC applications from TU Berlin / the recruitment of internal candidates, 2) Recruiting external candidates and acquiring external grantees, 3) Maintaining the success rate of TU Berlin, 4) Improving and extending the culture of welcome and appreciation, 5) Improving levels of satisfaction with the administration of the grants, and 6) Improving the international reputation of TU Berlin. The majority of these aims were reached during the reporting period and after successful evaluation of the three-year pilot phase, the strategy was made permanent at the end of 2020.

The newly-established ERC support measures and the comprehensive ERC service offers established themselves quickly and were met with positive feedback from researchers and ERC grantees at TU Berlin.

The number of ERC applications submitted in association with TU Berlin has more than doubled (from 36 applications in the working programs 2013-2016 to 74 applications between 2017-2020) with a concomitant increase in the quality of the applications. This improvement is the result of the introduction of quality assurance measures and the newly-established start-up financing for ERC applications, of which 40 applicants have taken advantage.

TU Berlin was awarded 7 ERC grants (and an ERC proof of concept grant) during the reporting period. The University’s excellent reputation is reflected in the high number of external ERC grantees who chose TU Berlin as their ERC host institution and researchers who choose to submit ERC applications with TU Berlin. In the reporting period, four external ERC grantees chose to conduct their work at TU Berlin and a large number of external researchers have submitted ERC applications with TU Berlin.

One of the new ERC grantees has been appointed as a group leader and three grantees were appointed visiting professor status, one of which will be switched to a joint appointment together with the DLR. As such, the ERC strategy contributes to establishing a permanent link with excellent researchers.
The next phase of the ERC strategy will involve the implementation of additional measures to increase the TU success quota. The most important requirements for this development – a clear increase in the number and quality of applicants – have already been achieved.
6.2 Programs

Funding program for junior scholars / tenure track

In 2019, TU Berlin acquired 17 tenure track professorships within the program for the advancement of junior scholars (WISNA program, 1000 Professuren program). The following measures were also adopted within the scope of the application:

- Appointment regulations
- Tenure Track regulations
- A staff development concept for permanently-employed academic personnel

An advisor for tenure track and career development for junior scholars was also financed from the strategy fund of the funding line. They will support the implementation of tenure track professorships, which must be filled by 31 May 2023. The procedure for approving the professorship and establishing the specialist and professorship-specific evaluation criteria were essentially concluded in 2020. The majority of appointment procedures have already started.

A draft concept for bias training for members of the appointment committee was also developed and submitted for discussion. A structured mentoring program for tenure track professors is currently being developed. Extending beyond tenure track professorships, this and other procedures developed together with the introduction of the tenure track are intended to introduce structural and cultural change.

Within their participation in the funding program, the faculties have agreed to fill a proportion of their professorships established in the TU Berlin budget using the tenure track procedure, so that a total of 25% of professors at TU Berlin will be tenure track professors. The Executive Board has pledged to support this with internal TU funding measures.

Einstein Profile Professorships (EPP)

The Einstein Profile Professorships program is a competitive instrument deployed by the Einstein Foundation to appoint high quality international staff of strategic significance for Berlin as a center of research and development. To this end, the Einstein Foundation has made some 500,000 euros per year available from the DAMP Foundation for five years. The State of Berlin has also committed to continue funding of these professorships after the end of the foundation funding. TU Berlin has submitted five applications since the start of this program in 2018. Three of the applications (two applications from Computer Science and an application from Mathematics) were successful. Appointments for two of the professorships are currently being finalized.

Werner von Siemens Professorships

The Berlin-based Siemens works, the Fraunhofer-Gesellschaft, the Federal Institute for Materials Research and Testing (BAM), and TU Berlin joined together in 2018 to establish the Werner von Siemens Centre for Industry and Science (WvSCIS). Funded by the State of Berlin, TU Berlin has acquired three new permanent professorships which were tendered in the fall of 2020: Design for Additive Manufacturing at Faculty V – Mechanical Engineering and Transport Systems, Materials for Additive Manufacturing at Faculty III – Process Sciences, and Mathematical Modeling of Industrial Life Cycles at
Faculty II - Mathematics and Natural Sciences. 2020 also saw Technische Universität Berlin acquire some eight million euros funding for 14 academic chairs engaged in the three current research projects at the Werner von Siemens Centre for Industry and Science (WvSC). Funding for these projects is provided by subsidies from the European Funds for Regional Development (EFRE) and the State of Berlin.
7

Study & teaching
Higher-quality teaching through the Quality Pact for Teaching

The reporting phase saw the successful conclusion on 31 December 2020 of the second funding phase of the Federal-State Program for Improving Studying Conditions and More Quality in Teaching (Quality Pact for Teaching). The program ran for a total of nine years (2012-2020) and received a total volume of funding 21.2 million euros.

The Quality Pact for Teaching sought to initiate a change in the culture of teaching at TU Berlin. The central framework project \textit{tu inspire} successfully initiated and promoted this change during the reporting period:

Three further strategy workshops took place in 2017, 2018 and 2020. The Ziethen retreats have established themselves as a regular institution and have generated a number of ideas for a new culture of teaching and learning at TU Berlin. An invitation to Ziethen has now become something of a distinction. The formulation, coordination and supervision of the complex process of discussion and implementation of the TU Berlin mission statement for teaching, and the impact of the Ziethen working group would indicate that \textit{tu inspire} has not only initiated processes of change but has ensured their continual development and vitality. The “Lunches for good teaching,” now in their fourth year, have also established themselves as a fixed forum of exchange with steady attendance figures. This process was accompanied during the
second funding period by a professional PR strategy which contributed to developing the range and visibility of topics focusing on teaching and teaching innovations.

As a result, the accompanying research conducted into quality development and impact assumed an especial significance during the second funding period. The centrally-established continual monitoring of the subprojects and the measures implemented in 2017 for their decentralized evaluation has enabled data-based documentation of the project developments and project results as well as the empirically-founded balancing of the Quality Pact for Teaching project, which served in the first quarter of 2020 as the basis for decisions regarding the continuation or discontinuation of the measures or projects started by the Quality Pact for Teaching. Six of the nine Quality Pact for Teaching subprojects were established on a permanent basis and transferred to the regular TU budget on 1 January 2021.

The one-year pre-study orientation program MINTgrün established itself as the largest study program at TU Berlin in 2017 and the largest pre-study orientation program in Germany. It has clearly demonstrated its importance in achieving an informed choice of degree program (see Fig. 8).

The media-based didactics continuing education courses and media services (e.g. unicam, podcasts / screencasts and remote experiments) introduced through the tu digit digitalization project developed by the online teaching team (ZEWK) and innoCampus during the reporting period established the necessary requirements to anchor digital media in teaching at TU Berlin long term.

tu tutorplus, the subject-specific university teaching qualification program for student employees with teaching responsibilities provided teacher training for a third of all newly-appointed student tutors between 2017 and 2020, thereby effecting a change in culture in terms of the quality of teaching provided by students. The student project teaching in tu projects also made a key contribution to fulfilling the aims expressed in the mission statement for teaching to enable experiences of self-efficacy and problem-solving at the beginning of students’ studies. The peer mentoring program tu buddy international introduced an intercultural service learning module in winter semester 2018/19, which has since established itself as an important aspect of Internationalization@home and the TU Berlin internationalization strategy.

In addition to monitoring tu inspire, the central Quality Pact for Teaching team also served as the interface between sources of third-party funding, project-executing agencies, the University management, the Quality Pact for Teaching subprojects, and the administrative areas of TU Berlin. The wide expertise available in the coordination team (evaluation, strategic and operative management and PR) ensured effective internal control and management of the subprojects and the overall project. The combination of teaching development and the coordination of future third-party funded programs has been continued in the Strategic Teaching Team since 1 January 2021. This team has supervised a range of projects since the first quarter of 2021, including the conclusion of the OPL and QIO projects and the applications for their successor programs.

MINTgrün – the pre-study orientation program

The free admission, two-semester pre-study orientation program MINTgrün was developed as a Quality Pact for Teaching project. Roughly 3,800 students have completed the course since its launch in 2012. Since 2017, approximately 600 pre-students have enrolled in the MINTgrün program, making it the largest pre-study orientation program in Germany. 35% of participants are women, a figure significantly higher than the corresponding numbers for MINT subjects in Germany. Participants attend foundation modules from the MINT degree programs taught at TU Berlin supplemented by classes developed for the course. Seeking to foster social responsibility in the next
generation of students, the program takes an interdisciplinary approach to the issue of sustainable development. The program seeks to provide an introduction to a range of approaches, techniques and methods from the subjects taught at TU Berlin. After completing the program, its participants are in a position to make an informed choice of degree program.

The formal requirement for admission to the program is enrollment in a bachelor’s degree program (physics) to obtain student status and thus the eligibility to take examinations which can be used for credit transfer after commencing a regular degree program. The science window module gives participants a perspective on research questions and career paths after graduation. The pre-study orientation program helps students address general questions within a degree program and strengthens their decision-making capacity. The foundation modules teach the knowledge required in the various subjects, which students can then apply in the MINTgrün project laboratories. In the reflection section of the program, participants consider how the specialist knowledge they have acquired serves the needs of society.

This innovative new pre-study orientation program is in high demand and has made an important contribution to the area of science communication. The first large-scale conference focusing on this issue to be held in Germany was held at TU Berlin. 21 universities and three ministries attended to receive advice. There were 100 academic contributions (articles, book chapters, workshops, poster presentations, lectures) and over 100 talks at schools and fairs for school students. The event also generated a further 100 newspaper articles, six television reports, three radio reports, 20 podcasts and one video blog.

TU Berlin will continue the pre-study orientation program in 2021.
7.2 Quality management, a raised profile and incentives for good teaching

System accreditation

After the decision taken by the Academic Senate in 2015 to introduce system accreditation, the Central Evaluation and Accreditation Agency review committee made its first inspection in January 2016 followed by a second visit in January 2018. Deficiencies identified in the quality management system meant that the procedure was suspended for a maximum of two years after receipt of notification in January 2019. TU Berlin was invited to address these problems in the intervening period and then submit an application for their resumption. This period was used to rectify the problems identified. Milestones in this area were the adoption of the mission statement for teaching in November 2018 and the decision taken in January 2020 to issue quality management regulations. Process descriptions were also supplemented and established, and degree program evaluation procedures carried out in over 40 programs. A revision committee was set up in July 2020 to conduct appeals procedures against internal accreditation decisions. A summary overview of the quality management system is provided in a quality management handbook. The application for resumption was submitted in December 2020; a final inspection is planned for March 2021.

The TU Berlin Mission Statement

1. Our educational goals
2. Academic education at TU Berlin
3. Our aspirations for teachers and students
4. Project-based learning and teaching
5. Research-based learning and labor market qualification
6. Individual profile building and active participation
7. Transition from school to university
8. Internationalization
9. Diversity and equality of opportunity
10. Sustainability
11. Digital transition is changing teaching and studying
12. Studying, teaching and life on the campus
The quality dialog, degree program review, teaching conferences and the evaluation of classes have been applied across the University since 2015 and contribute to improving teaching and studies. A total of 50 degree program evaluations had been performed by 2020 and have resulted in the further development of degree programs in relation to the mission statement for teaching. The University-wide surveys TUB Sonar and the graduate survey contribute to improving teaching and studying and identifying the areas requiring further action to implement the mission statement for teaching and TU Berlin’s quality aims. The surveys conducted in 2020 and 2021 including the survey of teaching staff in summer semester 2020, the course evaluations from summer semester 2020, the Teaching Committee survey, the survey of first-semester students in winter semester 20/21) focusing on the challenges presented by the COVID-19 pandemic were of particular significance. One result of these surveys is the decision taken on the targeted expansion of digital teaching and the improvement of the infrastructure necessary to achieve this. We expect that the “new normal” after the pandemic will include a greater proportion of digital teaching. A student-centered approach has been established as central to all digitalization measures.

Innovation in teaching and funding program for quality in teaching

During the reporting period, the position of an officer for PR strategy, communication and networking was established in the second Quality Pact for Teaching funding period. The position is responsible for supervising the TU Berlin Quality Pact for Teaching project and raising the profile and reach in the University of the development process of the mission statement for teaching (2017-2019), the Day of Teaching organized every semester, as well as issues of teaching, teaching quality and innovation in teaching.

Working under the question “When does good teaching pay out?” the 2018 Ziethen retreat developed initial ideas and approaches to the question as how best to incentivize teachers to become involved in initiatives for good teaching. Concluding that the matter was a complex issue requiring considerable action, the decision was taken to set up a working group to address the issue on behalf of the vice president for education, digitalization, and sustainability. The conference has developed a number of ideas which the working group will develop before issuing recommendations for action.

The incentive schemes for good teaching practice working group began its work on 29 May 2019. After analyzing the current situation in various areas, the group developed proposals aimed at developing existing instruments and measures to provide incentives for good teaching at TU Berlin. The working group presented its findings in a report to the Executive Board in early 2020 which was then circulated to various persons and bodies (e.g. to the deans of studies and the Academic Senate). Implementation of these proposals began in the third quarter of 2020 with consultation on a reform of the LINF system and the conception of a web portal for teaching on the TU homepage (in collaboration with the Press Office and the Quality Pact for Teaching team). The web portal will go online during the first quarter of 2021 (see chapter 3.3).

The incentive schemes for good teaching practice working group

2019 saw the establishment of the incentive schemes for good teaching practice working group. The working group developed proposals aimed at developing existing instruments and measures to provide incentives for good teaching at TU Berlin. The working group defines good teaching as exhibiting three characteristics: the consist-
ent implementation of the mission statement for teaching at TU Berlin; a high level of motivation amongst students and teachers; and a high level of motivation amongst those tasked with organizing degree programs and teaching rooms.

The working group presented its findings and recommendations in a report submitted in March 2020. Processes and projects for the implementation of these recommendations will be initiated beginning 2021. The central topics for action are: raising the profile and level of appreciation for good teaching; awarding prizes for good teaching; focusing on teaching skills in academics’ summaries of skills and experience; adaptation to the LinF parameters; promoting innovations in teaching; modifying the evaluation process in teaching; providing continuing education in university teaching; and intensifying the culture of welcome in teaching.

Transdisciplinary teaching

Transdisciplinary teaching was institutionalized at TU Berlin with the establishment of the position of transdisciplinary teaching officer in the Office of the Executive Board on 15 April 2020. The holder of this post has been tasked with developing, consolidating and raising the profile of transdisciplinary teaching at TU Berlin. To this end, TU Berlin launched an international networking campaign in May 2020, culminating in a double blind peer review publication project for the promotion of a specific method of transdisciplinary teaching. The Handbook of Transdisciplinary Didactics published in 2021, lead-managed by TU Berlin, brings together expertise on key issues in transdisciplinary teaching (e.g. living labs, Citizen Science, project studies) thereby addressing a requirement in the didactics of transdisciplinary teaching in universities. The handbook represents the start of a long-term international process of work and exchange in the basic principles of transdisciplinary didactics. Further tasks to promote transdisciplinary teaching at TU Berlin include the redesign of the Mathematics Building (the promotion of inter and transdisciplinary teaching formats through campus development) and the extension and refining of the TU Berlin transfer strategy.
7.3 Digitalization

Student Lifecycle Management (SLM)

Following the start of a pilot phase of the examination management subproject for selected degree programs in the fall of 2016, further milestones were achieved during the reporting period within the scope of the introduction of a Student Lifecycle Management system:

Within the examination management subproject, the pilot operation was consolidated through continual improvement of the applications and their expansion in accordance with specific TU requirements such as examiner-oriented examination registration and the new student app tailored to the needs of TU Berlin. The incorporation of all TU Berlin study and examination regulations in the SAP system was also continued.

A significant milestone was reached during the reporting period during the transition from 2019 to 2020 within the subproject “student administration services” when the first part of the student administration services went online in SAP. This means that all students, degree programs and staff were able to move away from HIS-SOS. The processes of enrollment, re-registration, leave of absence incl. semester fee, exmatriculation, the generation and provision of official university statistics and notifications to the statutory health insurance providers now operate completely in the Student Lifecycle Management system under SAP. All students are now able to verify themselves and obtain certificates via an app.

All processes were digitalized as part of the changeover to SAP. This removes the need for paper-based submissions and enabled staff to continue the application procedure during the lockdown of early 2020.

In addition to the completed consolidation of the first part of the student administration services in SAP, including the realization of remaining functions, preparations for the wide-scale requisite transfer of knowledge and data migration are currently being made to enable the rollout of SAP applications to all TU Berlin degree programs within the examination administration system.

Digital EU services

A range of activities were launched in the reporting period to prepare for the new Erasmus Without Paper, which represents a central pillar of the new Erasmus+ program generation set to start from 2021. This program foresees the successive and obligatory implementation of learning agreements, inter-institutional agreements, standardization and transcripts of records in an entirely digital fashion. Steps taken in this direction included the introduction of the Mobility Online database at TU Berlin for the administration of international cooperation and mobility schemes.

Digital campus and PIM

As a partner of the Federal Ministry of Education and Research-funded joint project “Digital Campus,” TU Berlin has set itself the target of establishing a portal of networked platform services dedicated to recruiting international students and providing them with a range of information, as well as language, subject-specific and cultural preparation for international study.

Since May 2020, TU Berlin and the University of Göttingen have been leading the Platform for International Student Mobility (PIM), a project financed by the Federal
Ministry of Education and Research. PIM provides universities, institutions of education, and students a digital platform to facilitate the transfer of ECTS credits earned in an international context. An important aim of this project is to provide universities with feasible solutions to facilitate implementation of the requirements of the online access law and the Erasmus Charter for Higher Education.

Online services for international students

Seeking to respond to the needs of international students during the current pandemic, TU Berlin provided a range of services for both exchange students and international students enrolled in conventional programs. These include digital introductory events tailored to the needs of the target group; digital information events covering questions such as residence law; digital German courses for exchange students taught by the Modern Language Center; and networking services to bring together small groups of students studying in the same course to discuss their studies online.

A focus was placed during the reporting period on efforts to make the digitalization of teaching beneficial for the internationalization strategy. In 2019, TU Berlin succeeded in acquiring EU and DAAD funding to develop new blended learning and virtual mobility formats, for example to integrate serious games with MOOC offers.

The expansion of e-learning and e-examinations

Working within the scope of tu digit (Quality Pact for Teaching up to 31.12.2020), the online teaching team in the Center for Scientific Continuing Education and Cooperation (ZEWK) expanded the range of support services for digital learning, teaching and examination formats at TU Berlin. The online teaching team was established on a permanent basis on 1 January 2021.

Advice, support and continuing education for digital teaching skills

The course program for the further development of digital teaching skills was extended to 8-10 courses per semester. Parallel to this, lecturers and teaching teams from all academic chairs are increasingly taking advantage of individual advice and support offers when developing innovative forms of teaching, from the conception phase to the production of teaching videos. The experience gathered during this process and the regular development of the offer portfolios proved particularly valuable during the digital semesters organized in response to the COVID-19 pandemic. The services were provided on an ad hoc basis, so that 46 courses, webinars with 420 participants, and other services could be run over nine months.

Digital media productions

A new professional audio cabin and a video studio are now used to record high-quality teaching materials ranging from podcasts to videos. Members of the teaching staff receive flexible support during all phases of the process from concept development to editing. As part of the response to the COVID-19 pandemic, TU Berlin moved quickly to loan over 200 recording sets and issue 400 software licenses for staff to use at home.
Information, experience reports and handbooks focusing on digital teaching

In addition to the praxis blog (focus: best-practice examples from all faculties) TU Berlin established a comprehensive wiki focusing on the concepts, methods and tools of digital teaching. Events were hosted to raise the profile of online teaching such as the tenth Day of Teaching in 2018 (focusing on gamification) and the incorporation of digital teaching issues in the “Lunches for good teaching.” Support was also provided for the Digital Education Hackathon 2020.

Digital examinations

Working together with innoCampus, the ZEWK online teaching team was able to establish on-campus e-examinations at TU Berlin. TU Berlin has provided e-examination courses for teaching staff every semester since 2016. The University uses the ISIS examination software, with which the majority of the teaching staff is familiar. Within a pilot project supported by the vice president for teaching, newly-purchased laptops have been made available to conduct on-site e-examinations and loan to students with financial hardships. The e-Assessment Alliance (EA²) BUA project will enable the expansion of on-campus laptop-based examinations.

The switch during the pandemic to online examinations conducted from home was facilitated by the organizational, legal, didactic and technical infrastructures and resources already established at TU Berlin by early 2020. TU Berlin shares experiences with other universities working in this area within the scope of the annual e-examination symposium (ePS), the SIG e-Assessment, and bilateral meetings with other universities in the Berlin/Brandenburg region. Discussions focus on a range of innovative issues such as tasks which are skills-oriented and automatically evaluable or subject-specific types of questions (such as describing and applying formulas and entering program code).
7.4 Creating opportunities and shaping transitions

In(2)TU Berlin

In 2015, TU Berlin began to concentrate the various programs which it provides for refugees (prospective students, students and researchers) under the aegis of the In(2)TU Berlin program. The range of measures involved all focus on the provision of professional advice and support as the individuals involved seek to take up and progress through their studies. This means that the Academic Advising Service is the first point of call for refugees who are studying or are interested in studying. Advisors provide individual consultation to help refugees adapt to the German university system and point them towards other services which can assist their integration in the University. The Preparatory School provides dedicated MINT language courses which enable specialist targeted language preparation for science and engineering courses. The guest student program for refugees enables an accessible introduction to studying in Germany. The program is supplemented by target group-specific psychological counseling services and advice services for students with disabilities and chronic illnesses, which are in part made possible through external funding. 2,000 advising sessions with refugees were conducted from 2017 to 2020; the language course was attended by 575 participants. Moreover, two refugee researchers were in receipt of funding during the reporting period from the Philipp Schwartz initiative run by the Alexander von Humboldt Foundation.

Educational Outreach Office

The reporting period saw the Educational Outreach Office integrate certain services for school students provided by the Academic Advising Service and the University's faculties.

The incorporation of career and study orientation in the school curriculum has resulted in a clear increase in demand for services provided by TU Berlin in this area. A dedicated contact person has been appointed at TU Berlin to liaise with schools and youth employment agencies. This ensures a sustainable cooperation.

The Educational Outreach Office has established itself as the central contact point for schools to request visits; it has developed a comprehensive overview of the needs of schools and translated them into a range of concepts, which are in high demand. This includes events, pilot projects organizing information events focusing on the student experience, as well as visits to laboratory sessions and lectures. The formats are supplemented by target group-specific elements to ensure the provision of effective study orientation programs and thereby act to encourage school students to apply to TU Berlin.

Since 2020, the Educational Outreach Office has supervised the development of a range of asynchronous digital audio formats focusing on the study programs offered at TU Berlin as well as general study orientation and advice. These are made available to schools and prospective students as part of “StudienberatungAtHome.” The next step in the overall program is the targeted communication of digital offers and the re-establishment of the partner school activities program run by the Educational Outreach Office.
Vocational training

With roughly 100 trainees in 15 different trades, TU Berlin is one of the largest providers of vocational training in Berlin. Our programs are recognized and certified by the Verwaltungsakademie Berlin (VAK), Industrie- und Handelskammer Berlin (IHK), and the Handwerkskammer Berlin (HWK). Vocational Training is responsible for the selection and appointment of trainees. Its responsibilities include recruitment, processing applications, IT-supported screening tests, and structured interviews and assessment centers.

The following table outlines the number of applications received between 2015 and 2020; the three occupations with the most applications are stated for each year (see Table 2).

<table>
<thead>
<tr>
<th>Applications received</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1451</td>
<td>1428</td>
<td>1454</td>
<td>1284</td>
</tr>
<tr>
<td>Chemical laboratory assistants</td>
<td>189</td>
<td>160</td>
<td>163</td>
<td></td>
</tr>
<tr>
<td>Administrative assistants</td>
<td>370</td>
<td>361</td>
<td>397</td>
<td>298</td>
</tr>
<tr>
<td>Carpenters</td>
<td>194</td>
<td>247</td>
<td>298</td>
<td>305</td>
</tr>
<tr>
<td>IT specialists for application development</td>
<td></td>
<td></td>
<td></td>
<td>123</td>
</tr>
</tbody>
</table>

Table 2
Applications for vocational training posts at TU Berlin 2015-2020

Over the past years, TU Berlin has employed an average of 46 trainees every year. In 2020, the exigencies of the COVID-19 pandemic meant that only 16 of the intended 47 posts could be filled.

Seeking to ensure the quality of training, Vocational Training has selected suitable departments where trainees can learn and become familiar with the tasks and responsibilities of their chosen occupation. Although it is not possible to guarantee every trainee a job at TU Berlin, the University has committed to guaranteeing employment to all those who complete vocational training in areas with sufficient vacancies. The only requirement is successful completion of the training and a favorable report. This commitment will be made clear in the job posting and currently only applies to the position of administrative assistant. In 2020, TU Berlin employed 17 of its former trainees.

Career Service

In addition to a number of programs organized by the Career Service to facilitate career entry, the reporting period also saw the successful launch of the TU company contact fair “jobwunder” and “jobwunderDIGITAL 2020.” These events were organized in cooperation with the Centre for Entrepreneurship (CfE) and the TU Berlin alumni program. They focus on startups, academia and the Berlin-Brandenburg region. The Career Service is also involved in the internal TU transfer audit and the establishment of the Industriestadt Berlin 2018-21 master plan (SenWEB) working in the area of staff transfer and the retention of skilled workers. The Career Service was also involved in drafting the new cooperation agreement with the Federation of Commercial Enterprises Berlin-Brandenburg in 2019. This agreement focuses on the issues of entrepreneurship, digitalization, the retention of skilled workers, continuing education and the cooperation between academia and industry. Following Career Service’s contributions to the regional group, the “Career Services in Berlin-Brandenburg” working group, and the umbrella organization csnd e.V., discussions were held about the possibility of establishing career services as a university unit within the Berlin State Higher Education Act.
The project funding for the Alumni Mentoring program (Quality Pact for Teaching) and the course PREAORE (QIO) were discontinued in 2020. 2020 saw the successful application for and start of the project (M)INT2work to prepare international and refugee students for career entry in Germany (Integra). This is one of three subprojects conducted with the Modern Language Center and the Preparatory School under the management of the Department of International Affairs.

All events were conducted online during the pandemic year 2020 under #CareerServiceatHome.

### The Deutschlandstipendium and fundraising

The reporting period saw the Deutschlandstipendium Office in the Career Service enter its 10th funding period. A number of records were broken with donations enabling 150 scholarships in 2020/21, bringing the total to 1,062 scholarships and a volume of 1.91 million euros awarded (including the contribution of 3.82 million euros from the Federal Ministry of Education and Research) in the 10 years since the start of the program in 2011.

One central development in the reporting period was the launch of the first matching fundraising campaign involving TU Berlin alumni and sponsors under the title “Simple donations work twice” run in cooperation with the Press Office and the Society of Friends of the TU Berlin. Since its inception in 2017, the program has seen annual growth in the number of scholarships awarded (2017: 28; 2018: 36; 2019: 58; 2020: 32 scholarships)

In addition to donations from companies, foundations and private individuals, TU Berlin organized two campaigns. Firstly, the crowdfunding of the student initiative Medieninformatik (MInitiative) providing one scholarship in 2019 and two scholarships (together with FU Berlin) in 2020. The second campaign “TU hilft” was launched by the Executive Board on the initiative of a TU Berlin professor during the 2020 pandemic year and raised funds for 28 scholarships using donations from University staff.

The increase in the number of applications and donations recorded in 2019 and the experiences from previous years led to the expansion of the selection committee through the addition of a member from each faculty. Each faculty now sends two representatives to the committee (one professor and one research associate). The statute has been revised accordingly. In addition to their role as the fundraising coordinator appointed by the Executive Office, since 2020, the chairperson of the selection committee also chairs the Society of Friends of the TU Berlin, so as to take advantage of synergy effects. To this end, the partners successfully tested a fundraising format as a networking event for current and potential donors. Held within the scope of the 2019 award ceremony, additional representatives from the various areas of the University were also invited. The aim was to harness additional potential and develop new projects such as in architecture.

### Centre for Entrepreneurship (CfE)

Over the last 11 years, the Centre for Entrepreneurship has been responsible for concentrating all measures in the area of entrepreneurship and providing practical support for startups. In 2017, the Executive Board adopted the Triple Impact Strategy to ensure the strategic development of the CfE. The center developed successful formats in the area of entrepreneurship teaching, innovation research and practical support for startups, with a focus on economic, ecological and social sustainability.

A transfer team was established within the scope of the strategic realignment of the CfE, which advises the academic chairs in the use of research data and provides a tar-
geted matching service with companies. The following section provides an overview of a selection of activities performed during the reporting period.

- 2019: Opening of EINS, a 1000 m² innovation platform and co-working space at Ernst-Reuter-Platz 1
- 2019: TU alumni generated a turnover of 5.4 billion euros and employed 31,000 members of staff (estimated value from the 2020 startup survey)
- 2017-2021: The CfE acquired 7 million euros of grants for startups
- 2018-2020: A total of 17 completed dissertations / 20 research contributions focusing on the issues of entrepreneurship, innovation and sustainability
- 2020: Development of the cooperation with BUA’s startup services through the establishment of the Science&Startups alliance
- 2020/21: The number of applicants for the Innovation Management and Entrepreneurship and Sustainability MSc increased to 1,343
7.5 Scientific continuing education

Center for Scientific Continuing Education and Cooperation (ZEWK)

The ZEWK continuing education program has continually expanded and its work targets the following groups:

- Tutors
- Research associates
- Post-docs
- Newly appointed professors and existing professors

2017 to 2020: an average of 62 courses per semester (summer semester 2017: 23 courses / summer semester 2020: 95 courses). 20% of these courses are taught in English.

Particularly worthy of mention are two certificate programs designed to open alternative career paths to doctoral graduates which were extended during the reporting period.

Participants in the Science Communication certificate program learn to communicate their complex and specialist findings to non-specialists. In the course, participants implement and reflect on a number of projects focusing on interdisciplinary issues such as press and media work, communication strategies, legal principles, basic and extended knowledge in writing, presentation techniques and design. The course also prepares its participants for the Science Management / Marketing continuing education master’s degree program taught at TU Berlin.

Taught in courses adapted to the career phases of its participants, the certificate program also strengthens research management skills, such as:

- Creativity techniques
- Writing project applications
- Financial planning
- Project management
- Team leadership
- Project evaluation
- Marketing research findings and various methodical principles.

The center also runs seminars for doctoral students focusing on a range of issues in phases ranging from preparing for a thesis to its defense and publication.

The Neuberufene@TUB program was implemented in cooperation with IIP EBW. An onboarding process consisting of a range of workshops and coaching services helps newly-appointed professors in the areas teaching, research and management.

The participants in these courses learn working and management techniques and a range of methods and approaches which support sustainable research and teaching practices. A range of career courses open perspectives on alternative career paths outside academia. Tutors can take part in courses which facilitate the transition from student to teacher and open a perspective on the possibility of becoming a research...
associate. Another course focuses on the transition to retirement for those coming to the end of their career.

The BANA course for auditing students is an innovative continuing education course for post-professional qualification.

**TUBS as the central provider of continuing education degree programs**

At the beginning of the reporting period, continuing education at TU Berlin was characterized by different forms of organization. In issuing resolution 41/2017 on 28 September 2017, the TU Berlin Executive Board decided to concentrate all new continuing education degree programs under the aegis of TUBS GmbH. The providers of existing programs of continuing education are encouraged to offer them through TUBS; this however remains voluntary. TUBS organizes and manages these study programs on behalf of TU Berlin. Academic matters such as curricula, statutes and regulations, examinations, the choice of teachers etc. are the sole responsibility of TU Berlin.

Handing over the organization of these degree programs to TUBS releases considerable potential, helps minimize administrative costs, spreads the economic risk of individual degree programs, expands the TU Berlin marketing and branding strategy and raises the level of general professionalism in this area. TUBS is currently engaged in the realization of the following five degree programs (all under the oversight of the Joint Commission for the Study Programs on TU-Campus EUREF): MBA in Energy Management, MBA in Sustainable Mobility Management, MBA in Building Sustainability, MBL in Energy Law and MSc in Science Management. TUBS will accept responsibility for the Space Engineering degree program currently run by Faculty V in summer 2021.

TU Berlin is also planning to task TUBS with the management of the study programs taught at its El Gouna campus in Egypt in 2021 as well as substantially increasing the number of additional seminars and continuing education certificate courses (both subject to fees) it offers.
7.6 Overview of new degree programs and student numbers

Winter semester 19/20 saw the establishment of four new master’s teacher training programs in the area of vocational training (Civil Engineering, Information Technology, Electrical Engineering and Mechanical Engineering) with Mathematics as a secondary subject. These programs are aimed at lateral entry students already in possession of a relevant degree qualification and who wish to qualify as teachers. A further new master’s degree program Theory and History of Science and Technology was introduced which serves as an expansion and replacement to the History of Technology and Philosophy of Science master’s degree programs. The Media Technology bachelor’s degree program (Fac. IV) was started in winter semester 18/19.

Two new master’s programs in Design and Computation (run in cooperation with UdK) and Systems Engineering were started in winter semester 20/21. The European Studies continuing education master’s degree program was discontinued.

The development in the number of students enrolled at TU Berlin is shown in Figure 4. An increase from 31,897 (winter semester 14/15) to 35,449 (winter semester 20/21) was recorded. The proportion of women students also increased slightly from 32.1% to 33.8%. The proportion of international students increased from 13% to 25.9% in the same period, demonstrating the increased international attractiveness of TU Berlin. The number of students completing their studies in the standard period of study increased from 17,883 in winter semester 14/15 to 20,588 in winter semester 18/19, before falling to 18,371 in winter semester 20/21.

Figure 6
The development over time of the total number of students completing their studies in the standard period of study in the winter semester of the respective academic year
The development in the number of students starting bachelor’s and master’s programs (1st degree semester) is shown in Figure 6. This decreased from 7,378 in the 2015 academic year to 6,203 students in the 2020 academic year. The number of students starting a master’s degree has remained steady at some 3,900 since 2015. Whilst the proportion of international students starting a bachelor’s degree remains almost unchanged at 16.1% since 2017, the number of such students starting a master’s degree increased from 24.3 % in 2014 to 38.8% in 2019. The same figures declined slightly to 37.1% between 2019 and 2020.

Figure 7 shows the development in the number of students in the 1st university semester and the 1st degree semester. Whilst a certain stability was achieved between 2015 and 2019, the decrease from 11,230 students to 9,693 in the 1st degree semester from 2019 to 2020 is striking. This represents the first time since 2015 that TU Berlin has not met the number of 5,440 students in the 1st degree semester agreed in the University Agreement. The relative proportion of students studying in their 1st university semester to those studying in their 1st degree semester decreased from 0.53 to 0.48 between the 2019 and 2020 academic years.
Figure 8 shows the development in the number of students graduating from a bachelor’s or master’s degree. The figures for graduates from master’s degree programs registered an increase from 1,780 (2014) to 2,639 (2019). There were no clear trends for bachelor’s degrees. Substantial examination data for 2020 has not yet been gathered, but the conditions of the COVID-19 pandemic lead us to expect a decrease in the number of graduations. Comparison of the figures for students commencing and graduating from an individual degree program clearly shows that success rates are significantly lower in bachelor’s than in master’s degrees and underlines the need for action.

Figure 9
The development over time of graduations in bachelor’s and master’s degree programs 2014-2019
Teacher training

School of Education TU Berlin (SETUB)

SETUB has been active on many levels since 2017 to advance the coordinated development of teacher training at TU Berlin. Working within the scope of the nationwide “Quality Initiative in Teacher Training,” SETUB achieved success in every round of funding and acquired a total of 4.4 million euros for three projects in the period 2016-2023. The projects concentrate on the three comprehensive areas of focus common to all three teacher training degrees:

1) The development of a praxis and research-orientation in teacher training degrees (teaching & learning laboratories, co-labs for the development of tasks and problem-oriented learning arrangements)

2) Digitalization of the teacher training programs (the media didactics innovation laboratory, the use of digital feedback tools in the practical semester, the Q-Master Quest learning platform)

3) The diversity-sensitive recruitment of teacher training students

Seeking to prepare teacher training students even better to master the issue of digitalization, TU Berlin applied for and was granted funds from the “Special program for the best (teacher training) education in Berlin” maintained by the State of Berlin to set up a new professorship for “Education in the Digital World.”

The current shortage of teaching staff in Berlin requires a range of measures from TU Berlin. In addition to its regular Prevocational Education degree program, the Senate Department tasked TU Berlin with the training of lateral entrants to the teaching profession in the subject Economics, Work and Technology. Winter semester 2020/21 saw two cohorts with a total of 46 lateral entrants enroll in this part-time degree program.

TU Berlin also continued its endeavors to internationalize its teacher training program by establishing the framework conditions for further student mobility. This included a semester at FHNW Basel and NTNU Trondheim, a practical semester in German schools outside Germany and the opportunity for students to work on their final theses at Bar Ilan University in Tel Aviv. This was supplemented by the MOVE IT project run between 2021-2024 and funded by a DAAD grant of 600,000 euros. The project is preparing to implement a range of initiatives including a tri-national, digitally-supported tandem program and the establishment of a national round table for the internationalization of vocational teacher training programs.

The stated aim of SETUB is to adapt development programs to the needs of students in an evidence-based fashion. In addition to the instruments of system accreditation, TU Berlin conducted a number of student surveys during the reporting period and involved those in teacher training in their evaluation. These included:

- The annual first-semester student survey, a comprehensive student survey conducted in summer semester 2019
- A survey focusing on experiences during the pandemic semester
- A number of surveys focusing on experiences gathered in the practical semester

SETUB also extended its collaboration with other universities. In addition to regular and intensive cooperation within the scope of the practical semester with the other Berlin universities involved with teacher training, TU Berlin also signed cooperation agreements with Freie Universität Berlin, Humboldt-Universität zu Berlin and Beuth.
University of Applied Sciences focusing on extending and safeguarding study programs. Working together with five universities of applied sciences (FH) in Berlin and Brandenburg, TU Berlin established the strategic cooperation project for lateral entrance master’s programs to improve communication with prospective students.

Development of teacher training programs

Responding to the long-term, nation-wide shortage of students enrolled in teacher training degrees for vocational subjects, TU Berlin focused on the development of innovative study programs to attract new applicants in this area during the reporting period. A special master’s degree program for lateral entry students holding an engineering degree enables direct entry to a Master’s of Education program and thus entry to the teaching profession. Additional funding from the University Agreements enabled the establishment in winter semester 2019/20 of four new study programs in which students study Mathematics as a secondary subject in conjunction with a core subject (Civil Engineering, Mechanical Engineering, Electrical Engineering or Information Technology). The size of the first two entry cohorts to these programs show that they have attracted a significantly larger number of students than the previous degree types.

Following the recent negotiations for the University Agreements, admissions to teacher training bachelor’s degree programs with restricted admission have increased. Thus for instance, admissions numbers to the Prevocational Education bachelor’s program (without students with a secondary subject) increased from 60 to 100 (winter semester 2020/21); admissions to the Food Science and Nutrition degree program increased from 25 to 48. These increases resulted in a number of ideas for reforming these programs, which the University is working hard to implement.

After a slight increase in recent years, student numbers at TU Berlin have stabilized. The total number of SETUB students (including students with a secondary subject in Prevocational Education) currently amounts to 961.

### Table 3

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of TU teacher training students (WS)</th>
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<tr>
<td>2016/17</td>
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<tr>
<td>2017/18</td>
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<tr>
<td>2018/19</td>
<td>814</td>
</tr>
<tr>
<td>2019/20</td>
<td>788</td>
</tr>
<tr>
<td>2020/21</td>
<td>827</td>
</tr>
</tbody>
</table>

Teacher training students at TU Berlin (core subject students per winter semester)
8

Sustainability & climate protection
The Council for Sustainable Development & Sustainability Report

2018 saw the TU Berlin Council for Sustainable Development organize the first ever sustainability competition with a prize of 200,000 euros. The competition launched 17 projects seeking to make a contribution to the sustainable development of TU Berlin. This includes a CO₂ meter, a sustainability portal, a cargo bicycle sharing scheme, the planning of raised beds on the campus and a number of other exciting projects.

October 2020 saw the publication of the first TU Berlin Sustainability Report, the contents of which are also available in the new sustainability portal. To this end, the TU Berlin Environment Report, published annually over the preceding twenty years, was developed further as part of a participative process under the management of the Council for Sustainable Development and Occupational Health and Safety Services and Environmental Protection. This report is based on the 17 UN sustainable development goals to which TU Berlin has signed up in full; a commitment renewed through its joining the HochN network of universities.

The Climate Protection Agreement (KSV)

In the Climate Protection Agreement concluded with the State of Berlin and the Senate Department for the Environment, Traffic and Climate Protection, Technische Universität Berlin committed to targets aiming at a 25% reduction in CO₂ emissions (some 13,000 t of CO₂) between 2020 and 2030. Working together with the stakeholders involved at TU Berlin, the University submitted a working version of the Climate Protection Agreement to the Senate in December 2020. The 33 measures of CO₂ reduction are subdivided into the following groups: construction and technical measures, renewable energies, mobility, digitalization, measures in teaching and research, knowledge transfer and networking, organization, climate balancing measures and adaptation to climatic developments. At the end of 2020, the State of Berlin supplemented the target originally established in the Climate Protection Agreement – reduction of CO₂ emissions within a 10-year period – with an additional focus on avoiding the generation of CO₂ emissions resulting from burning fossil fuels. The decision was also taken to integrate the 10-year measures in a climate neutrality pathway extending to 2050.

This pathway demonstrates how TU Berlin can become climate-neutral by 2050 and will be drawn up within the scope of the revision of the Climate Protection Agreement in the first half of 2021. May 2020 saw the Executive Board of TU Berlin establish the Climate Action Task Force (CATF) led by the member of the Executive Board responsible for sustainability issues. The CATF has been tasked with networking, implementing and evaluating the climate protection activities of TU Berlin.

TU Berlin began to implement certain individual measures agreed in the Climate Protection Agreement before it was concluded. Evaluations are being conducted of all current building measures as to whether they satisfy the requirements of climate neutrality. The findings from these evaluations will be incorporated in future building and modernization projects to ensure long-term progress in this area. Building plans will be coordinated closely with academic projects conducted by TU Berlin such as “Energetic modernization of the TU Berlin Charlottenburg Campus.” A further project for the installation of a green infrastructure in the hydraulic engineering hall financed by a BENE application from the “green infrastructure project” is currently underway. The Charlottenburg-Wilmersdorf district authority has expressed an interest in becoming involved in financing the measure. The project seeks to implement a public, research and teaching-related living lab project related to the issues of building facade greening and precipitation water management. The project is to be supplemented by the addition of an approx. 2000 m² solar power system.
The Climate Action Task Force & One-Stop Climate Shop

These developments were supplemented by the establishment of the Climate Action Task Force. Set up by and reporting to the vice president for education, digitalization, and sustainability, this committee coordinates the climate protection measures conducted within the University and seeks to play its part in establishing TU Berlin as a climate-neutral institution. The committee is responsible for the implementation and monitoring of the Climate Protection Agreement. The One Stop Climate Shop was set up as the central contact point for internal and external inquiries relating to all climate protection matters and acts to network the various stakeholders in this area.

In July 2019, the TU Berlin Executive Board expressed its support for the aims of the Paris Convention on Climate Change and the 1.5°C target demanded by Fridays for Future Germany. The Executive Board and Scientists for Future TU Berlin have made a number of public interventions in support of the campaign for the action required to bring about a sustainable future.

Energy in Motion

Seeking to stimulate discussion on the topics of renewable energies on the basis of scientific findings, TU Berlin took over the exhibition "Energy in Motion" developed by the private company Total. Working together with a range of further partners (Windnode, MINT-EC, SINT-EG), it installed the exhibition in the rooms of the old TU Berlin library in the TU Berlin Main Building. Based on the exhibition, a group of teachers from the MINT-EC network developed a curriculum for the secondary education level (Sekundarstufe). The exhibition was opened as part of the Long Night of the Sciences on 16 June 2019 and is especially suited to school classes and groups of students. The exhibition was supplemented by exhibits from students who had engaged with the topic in their Critical Sustainability course. The rooms are also used for a range of different events all focusing on the topics sustainability, the energy transition, and climate protection.

Sustainability as a central part of all modules

On 7 November 2018, the Academic Senate established the UN definition of sustainability as a central learning objective at TU Berlin. To this end, the General Study and Examination Regulations passed on 9 September 2020 specify that “students are to learn to examine their acquired knowledge and resulting actions within a higher historical, social and cultural context and to consider the ethical consequences of action, in order to make their own personal contribution to sustainable development.” This requires that students complete corresponding tasks amounting to a minimum of 12 credit points. By taking this step, TU Berlin ensures that every student is introduced to issues of sustainability, irrespective of their degree program.

The sustainability certificates introduced in 2017 were made permanent in January 2021. This enables students in all programs to engage critically with the topic of sustainability. Participants are required to earn 18 credit points and complete a project assignment or final thesis on a topic related to sustainability. The certificate program and the certificate module focusing on critical sustainability were well received and are now also available as an English-language offer. By now making the program available as an English-language offer, TU Berlin demonstrates to international students its commitment to its responsibilities within its curriculum. The Blue Engineering concept (itself closely related to the sustainability certificate) has been adopted by a range of further universities and serves as a model for sustainability-oriented engineering training.
October 2019 saw the launch of the “TU Berlin for Future Climate Change” lecture series. The event has gathered together a broad range of researchers from TU Berlin and other institutions to provide lectures to an interested general public. Attendance was excellent and the series was repeated in winter semester 2020/21 as an online event. Plans are being developed for its continuation.
International affairs
9.1 The internationalization strategy and responsible units

The HRK Internationalization of Universities re-audit

Working within the scope of the HRK Internationalization of Universities re-audit (2015-2018), TU Berlin succeeded in implementing many measures to promote internationalization, whilst at the same time raising awareness of both its internationalization and internationality. The participative inclusion of all responsible persons in the development and implementation of these measures helped form an important foundation for the success of the re-audit. This also allowed participants to strongly identify with the areas for action and corresponding measures.

Internationalization@home

The measures implemented within the scope of the re-audit have highlighted the potential of internationalization at staff and structural level and have created and released synergies at working and strategy level. As part of Internationalization@home, a University-wide language policy was developed and a central translation service established. A specific auditor program enables refugees to participate in classes at TU Berlin and even take examinations in individual cases. Members of staff at TU Berlin can participate in a special continuing education course with an international focus, culminating in the award of the Intercultural Knowledge and Competence certificate. Non-academic personnel can also take advantage of the opportunity to participate in an exchange with a TU partner abroad. This program is financed from central funds.

Establishment of the Department of International Affairs

One of the central and institutionally significant measures introduced within the scope of the re-audit was the establishment of the Department of International Affairs in 2016. This was the first time at TU Berlin that all the measures and forms of internationalization at university level had been brought together within a single department. This represents an important step towards coordinating work in the area of internationalization on a strategic basis. In addition, internationalization at TU Berlin can now benefit from a greater level of internal and external visibility and a wider scope of action.

With all the organizational functions of a department, the unit reports to the president of TU Berlin through the vice president for strategic development, junior scholars, and teacher education. January 2018 saw the appointment of a new head of department with a long history of international experience and strengths in strategic management.

A further structural development in the area of internationalization was to assign responsibility for the issues of diversity and international affairs to Equal Opportunities Controlling (see chapter 10).

The structures for exchange and discussion created within the course of the HRK re-audit, such as the vice deans’ conference for international affairs and the international advisory board, have also helped establish a broad base for the University internationalization strategy. The measures taken have contributed to a cultural and structural
change at institutional level and represent an important transition to the long-term goal of mainstreaming the internationalization strategy at all levels of the University.

The TU Preparatory School

The Preparatory School is incorporated in the Department of International Affairs. The intensive teaching at the Preparatory School is a good practice model for international applicants who wish to prepare for a degree program. A total of 12 Preparatory School courses run per semester (six in the first and six in the second semester) with an average participation of between 20 and 25 students. The courses focus on engineering and are aimed at students who wish to study engineering or natural sciences. Courses for economic and social science degree programs, a course for medical degree programs commissioned by the Charité, and a precourse with tuition fees are also offered.

The Preparatory School has offered general and specialist language courses for refugees since November 2015. The courses are financed by the Federal Ministry of Education and Research and the German Academic Exchange Service (Integra program). At present, three such courses with approximately 15 participants are currently running.

Working together with the Goethe Institute in Cairo, the TU Berlin Preparatory School launched a three-year pilot project to run a T course in Egypt. A similar course for running the assessment test has been launched in Casablanca, where examinations for the first cohort were successfully conducted in summer 2020. Working with a consortium of German universities, the DAAD and the Goethe Institute, TU Berlin has also joined a project to establish a digital course for preparation to study in Germany.
9.2 Internationalization measures

Internationalization does not just mean collaboration and exchange with international partners, but a lived culture of internationalization on our Berlin campus. TU Berlin welcomed a total of 8,638 international students in winter semester 2020/21. At the end of 2020, more than 9% of professors and 21% of research associates held non-German citizenship. A range of internal measures have been implemented during the reporting period to provide all members of TU Berlin – both national and international – with the best-possible study, working, teaching and research conditions:

- The provision of English-language online and offline information and forms. The TU translation service is well-established and provides a comprehensive service for the faculties and central administration focusing on the translation of forms, calls and other texts. This also enabled the website to be relaunched as a bilingual offer. An academic text editing service for junior scholars established in 2020 has generated good feedback.

- TU Berlin staff can participate in a course of international and intercultural continuing education culminating in the “Intercultural Knowledge and Competence” certificate: The certificate is issued following an examination by Human Resources and Continuing Education. Intercultural training seminars, language courses and participation in the mobility program or other private and professional international experience will be recognized.

- International Week: Open to all members of TU Berlin, International Week provides information about all aspects of international exchange. International Week moved online in summer semester 2020. The positive reach of the event meant that the virtual format will be retained and extended in future years.

- The international buddy program: This well-established program facilitates exchange between TU students and students from our partner universities. Some 500 TU students provide advice and support to international exchange students every year to help them make a good start at TU Berlin. In so doing, they make an important contribution to the social and academic integration of exchange students at TU Berlin and the stated aim of internationalization@home.

- Intercultural skills: Since 2019, TU students have the opportunity to take an intercultural module. Students can receive six credit points for their degree program or an additional qualification.

The TU Berlin language policy

As part of the ongoing process of establishing German / English bilingualism, multilingualism, intercultural skills and a culture of internationalism and diversity at TU Berlin, the Academic Senate moved on 16 May 2018 to establish the TU Berlin language policy, itself an important milestone in achieving these goals. This policy is but one component of a broader strategy adopted within the scope of the internationalization re-audit.

The TU Berlin language policy seeks to establish a common understanding of the importance of language and language acquisition at TU Berlin. The long-term goal of the policy is to provide the best possible support for members of TU Berlin in their attempts to acquire language skills. A considered and reflective approach to language and multilingualism is a defining feature of an open and globally oriented university culture, and an explicit component of our successful internationalization strategy.
Rather than a set of regulations with direct effect on the employment conditions of staff, the language policy represents a series of recommendations regarding language teaching and multilingualism at TU Berlin, based upon three central principles:

1) German as the central language
2) English as a second language
3) Embracing multilingualism and intercultural skills

TU Berlin seeks to support its members by providing a number of language acquisition offers through the following units:

- Human Resources and Continuing Education (II PE-WB)
- The Center for Modern Languages
- The Center for Scientific Continuing Education and Cooperation
- The Language and Cultural Exchange

The Modern Language Center

The Modern Language Center was able to maintain regular teaching offers during the reporting period. More than 2,100 students from all faculties studied eight modern languages in an average of 100 courses per semester.

All the courses taught at the center are oriented to the needs of academic language and prepare students to study both abroad and in Germany. A range of courses teach subject-specific language skills such as “Technical German” or “Subject-oriented English for the natural and engineering sciences.” All these courses conclude with an examination; students can apply credits earned in these courses to their elective or compulsory elective subjects. Student demand for these courses exceeds supply by 100% (approx. 2,100 waiting students per semester). The failure to increase resources for the Modern Language Center has prevented it from expanding its offers.

The Modern Language Center works closely with the Department of International Affairs to match demand. The Modern Language Center also works together with the Preparatory School under the aegis of the INTEGRA program (preparation for studies for refugees) and since 2020 has provided part-time language courses for refugees using external funding.

The Modern Language Center works together closely with international partner universities, especially in China, Spain, France, and Russia, to provide TU students with the best-possible foreign language courses. The Modern Language Center is a member of the German TU9 expert association of modern language centers. The cooperation agreements made with HWR Berlin and Beuth University of Applied Sciences are to be continued. In 2020, the Modern Language Center started the first courses of continuing education for TU Berlin teaching staff teaching in English called “English as a Medium of Instruction.” Offers from the Chair of German as a Foreign Language for teaching and research personnel at TU Berlin were continued successfully in the form of “German for university and work” evening classes. The Modern Language Center is a certified test center for the TestDaF and ONSET examinations.

In response to the COVID-19 pandemic, the Modern Language Center moved almost all of its teaching and examinations online in March 2020. The center developed and tested a range of new curricula, tools, and teaching and learning materials to ensure that teaching could be continued.
Language and Culture Exchange

The Language and Culture Exchange continued its work successfully during the reporting period, offering between 100 and 130 courses to between 700 and 1,200 participants every semester.

The number of courses and participants is currently declining, as the courses are neither subject to credit transfer within the University nor accepted by official language examinations. This disadvantage is offset by the cultural and creative diversity of the courses offered.

Past years have seen the Language and Culture Exchange develop a large range of quality assurance measures, including

- Regular and systematic course evaluations
- The development of internships for future school teachers
- The organization of workshops and further training courses for established school teachers

The Language and Culture Exchange, Modern Language Center, and Chair of German as a Foreign Language began collaboration in a number of areas such as teacher exchanges and joint measures of further training which will be expanded in coming years.

Internationalization in research

Researchers at TU Berlin have developed countless international research contacts. TU Berlin supports the development and maintenance of research contacts with a range of strategic partners through start-up financing and the acquisition of mobility funding (ERASMUS+ mobility with partner countries). Of especial interest are the partnerships with the stakeholders of the Berlin University Alliance and the University of Oxford. These partnerships have already generated fruitful research collaborations. TU Berlin has recently acquired a new partner university, the University of Technology Sydney.

TU Berlin does not just focus on those universities at the head of international rankings, but also seeks to support researchers working on questions of global importance and within partnerships with institutions from the Global South. 2019 and 2020 saw a number of seed funding calls for projects with the Global South. TU Berlin is also actively engaged in the development of the Berlin Center for Global Engagement (BCGE) of the Berlin University Alliance, established in 2020.

The concept developed in 2018 for the advancement of junior scholars focuses explicitly on increasing the international mobility of junior scholars as a strategic policy. Specific measures have been implemented to enable junior scholars to acquire international experience. Seeking to raise its profile as an institution of excellent research in the European and international research landscapes, TU Berlin works within its EU and ERC strategy to increase the volume of EU and ERC funding which it receives.

Internationalization in studies and teaching

The mission statement for teaching adopted at TU Berlin in 2018 underscores the importance of preparing students for international careers as well as the importance of the internationalization of teaching. The internationalization of teaching focuses on two aspects:

1) The mobility of international students at TU Berlin for exchange and full study
2) The mobility of TU students to partner institutions

TU Berlin has developed a database to facilitate recognition of international courses and degree programs. The value of this database in promoting international mobility was recognized by the award of a prize from the Stifterverband. The international buddy program improves the integration of international students, whilst enabling TU students to develop intercultural skills without leaving their campus.

With a total of 8,638 international students (25.7% of the total intake), TU Berlin assumed a leading position in Germany for international diversity in 2020.

A focus was placed during the reporting period on efforts to make the digitalization of teaching beneficial for the internationalization strategy. In 2019, TU Berlin succeeded in acquiring EU and DAAD funding to develop new blended learning and virtual mobility formats, for example to integrate serious games with MOOC offers.
9.3 
Mobility programs

Mobility programs for students

During the reporting period, TU Berlin succeeded in developing international degree programs (12 consecutive and 12 continuing education master’s degree programs) which address international students either in general or from a certain region. New dual degrees were added and a number of existing programs were updated. TU Berlin takes advantage of the opportunity provided by the ERASMUS+ program to integrate a European or international dimension in teaching and studies in as many areas as possible. The extension of student and staff mobility levels are two central aims of ERASMUS+.

TU Berlin operates more than 570 exchange programs with universities in Europe and over 80 cooperation agreements with partner universities outside Europe. TU Berlin welcomes some 600 exchange and dual degree students every year, whilst 550 of its own students go abroad to study at one of its many partner universities. A slow but constant increase in student mobility numbers has been observed over the past years. Fortunately, more and more students from natural and engineering sciences programs are applying to complete part of their studies at a partner university outside Germany; this group was previously underrepresented in the international mobility statistics. The number of students applying to study for a single semester abroad is also increasing.

Student Mobility and International Students works closely with the academic chairs and international officers within the faculties to advertise programs, provide information and advice and assist in selecting applicants.

Staff mobility

The program for staff mobility and outgoings to partner institutions serves to:

• Promote specialist networking
• Maintain networks
• Refresh language skills
• Extend the professional cultural horizon of non-academic personnel

A program tailored to the needs of the target audience was launched to promote staff mobility and is promoted and administered by the Department of International Affairs. Calls and selection procedures attracting an average of 20 applications are made twice a year. All travel plans for 2020 were canceled in response to the COVID-19 pandemic. Scholarship holders should be able to travel again as soon as the situation has normalized. The conditions prevailing during the pandemic meant that the University decided against issuing a University-wide call. Interested parties were encouraged to establish contacts with partner institutions so as to prepare a possible application after the end of lockdown.
9.4
Raising the profile of TU Berlin through international networking

TU Berlin maintains a large number of active research collaboration agreements throughout the world. Working on the basis of long-term sustainable collaboration, we currently maintain strategic partnerships with seven universities:

1) Warsaw University of Technology
2) Norwegian University of Science and Technology
3) Politecnico di Milano
4) Technische Universität Wien
5) St. Petersburg State Polytechnical University
6) Tongji University
7) University of Science and Technology, Sydney

A total of 109 international agreements with leading universities throughout the world and further mobility agreements with 300 European and 8 non-European universities as well as membership in leading global networks such as the TIME network and TASSEP program ensure that TU Berlin is at the heart of international academic cooperation.

TU Berlin also runs two liaison offices in Cairo and Brussels and is a partner in the German Centers for Research and Innovation in New York and São Paulo. All locations make a central contribution to raising the international profile of TU Berlin by working intensively to maintain and expand existing networks, implement our research marketing strategy and identify and recruit junior researchers.

The El Gouna campus and central institute

The El Gouna campus in Egypt performs a similar role. Providing internationality and excellent application-oriented teaching divided between Egypt and Berlin, the El Gouna campus of TU Berlin offers a unique experience. The degree programs and research projects run on the campus focus on the most pressing development questions currently facing the Global South and act as a testament to the commitment of TU Berlin to its global responsibility.

After establishing itself as a stakeholder in the Egyptian university landscape, TU Berlin has intensified its networking efforts in the MENA region in more recent years. Various academic projects were completed with partner universities from Algeria to Tunisia and Iraq. These projects focus on the exchange of knowledge and experience within a relationship of equality with the aim of developing the content and learning experience of degree programs. Further relationships have been established with India and Iran. In 2017, the Department of Urban Development in El Gouna organized the international conference "Quality of Life" in cooperation with the Egyptian Housing and Building Research Center (HBRC), which attracted 230 active participants. The first German-Egyptian forum focusing on the energy transition in Egypt was hosted on the campus in 2020 and attracted leading international experts.

Some 180 students from 28 nations have already graduated from a master’s degree program at Campus El Gouna and are currently employed as specialists in important
roles in industry, civil society and the educational sector throughout the world. The founding of the Alumni Club in October 2016 marked the start of the systematic development of the international network of former students. A DAAD-funded alumni degree semester has been organized every year since 2017. Alternating between EL Gouna and Berlin, the program focuses on social topics of global interest and has received further DAAD funding for 2021/2022.

The COVID-19 pandemic has had a considerable impact on the EL Gouna campus. Public health and travel restrictions mean that teaching has been moved online, at times taking place across continents and time zones. As such, it was not possible to accept a new academic cohort. 2021 will be defined by a process of evaluation and a strategic re-orientation of activities.

Further development of international cooperation

TU Berlin has played an active role in the development of the Berlin University Alliance as part of a wider strategy to increase its international profile. Our three strategic partners

1) University of Oxford
2) University of Melbourne
3) National University Singapore

all have international reputations as leading centers of research. Structured programs, such as the Centre of Advanced Studies established together with the University of Oxford, provide researchers at TU Berlin with excellent new opportunities for top-level international scientific cooperation.

In addition to working to extend the cooperation hosted within the scope of the Berlin University Alliance, TU Berlin successfully established the European Universities of Technology Alliance (ENHANCE) in November 2019. TU Berlin sees this as a route to extend its European strategic partnerships and raise its profile at the European level. Members of the ENHANCE alliance include:

1) Chalmers University of Technology (Sweden)
2) Norwegian University of Science and Technology (Norway)
3) Warsaw University of Technology (Poland)
4) Politecnico di Milano (Italy)
5) Universitat Politècnica de València (Spain)
6) RWTH Aachen University (Germany)

2020 also saw TU Berlin act as the lead applicant in an application for EU funding for the ENHANCE alliance. The successful application was the green light for further development of this truly innovative European initiative. Through

• Simplified mobility
• Blended learning offers
• And best-practice teaching and learning methods

ENHANCE aims to enable students to take part in a truly European degree program. In terms of research, ENHANCE will strengthen the co-creation of knowledge on the European level, above all in the field of sustainable cities and climate action.
Gender equality, diversity & equal opportunities
10.1 Research, units & services

Coordinating Office for Women’s Advancement and Gender Equality

2017 saw a new appointment to the office of the TU Berlin Main Women’s Representative; the new post-holder was re-elected unanimously for a second term of office in 2020. In 2018, the office of the Main Women’s Representative was re-named as the Coordinating Office for Women’s Advancement and Gender Equality. The new title is intended to reflect developments in women’s advancement and gender equality, and to raise the profile of the unit and its staff.

During the reporting period, the Main Women’s Representative coordinated the TU Berlin application to the national women’s Professorinnenprogram III. The application was approved and TU Berlin is now able to implement three early successor appointment procedures for women using 1.8 million euros of funding. A further focus of work during the reporting period was the coordination of applications for measures within the Berlin Equal Opportunities Program.

Gender equality projects were also continued and long-term successful projects were established on a permanent basis within the reporting period. These included the Promotion program for women doctoral candidates. This program was made permanent in 2018 and, in accordance with the precepts of gender mainstreaming, its administration was established in the TU Berlin Center for Junior Scholars.

The Coordinating Office for Women’s Advancement and Gender Equality retains responsibility for the International Post-Doc Initiative (IPODI) which awards fellowships to excellent women academics and was co-financed by EU funds until 2018. This also represents the continuation of a project which had proven very successful. Funding was secured from 2019 with internal funds.

The reporting period also saw the establishment of a new cooperation with the TU9 partner universities, which submitted a joint application to the EU for project funding in September 2020. The Joint Programs project, which awards visiting professorships to women from industry and thereby seeks to promote alternative career paths, was financed until the end of 2018 by the Professorinnenprogramm II. The success of the project meant that it could be continued using TU Berlin’s own resources.

July 2017 saw the approval of an application to the Berlin Equal Opportunities Program from an alliance of 13 universities for funds to realize the DiGiTaI project. This project was implemented during the reporting period. An application for continued funding will be submitted to the funding organization at the end of the reporting period. The ProScience project for women students continues to be run under the aegis of the Coordinating Office for Women’s Advancement and Gender Equality and was implemented during the reporting period.

The office also coordinates the award of the annual Clara von Simson prize for excellent final theses from women students in MINT subjects.

An important issue during the reporting period was the provision of support to women members of technical and administrative staff. A meeting of all women members of staff was called in 2019 to debate the issue of fair pay. The latest edition of the journal NEWS, edited by the Coordinating Office for Women’s Advancement and Gender Equality, focused on this important issue during the first quarter of 2021. A TU Berlin language guideline was issued in the reporting period; its recommendations met with positive feedback. The guidelines focused especially on the issue of gender diversity,
which was subsumed within the TU Berlin diversity strategy. A part-time post was established within the Coordinating Office for Women’s Advancement and Gender Equality to work in this area, initially limited to the end of the reporting period. A number of measures were taken to this end:

- Summarizing information on this topic on a website
- Providing advice to those affected
- Introducing continuing education measures

The campaign “Time for a cultural change – Fight sexism in all forms” was also organized. Participants made posters and organized workshops to raise awareness of this issue. The campaign was selected a best practice example by the Federal Anti-Discrimination Agency and was featured on its website during the first quarter of 2021.

Workshops for women researchers, coaching for women professors, courses of continuing education for women’s representatives and further events on a range of topics were organized during the reporting period. An event which generated especial resonance was the theater play “Curie, Meitner, Lamarr – Uniteilbar” staged to mark International Women’s Day 2019. The Main Women’s Representative and her deputy and staff are all involved in a number of committees and working groups, where they advise on issues of gender equality.

Strategic controlling, gender equality, diversity, and internationalization

The remit of Equal Opportunities Controlling was extended during the reporting period to encompass strategic controlling, gender equality, diversity, and internationalization. It is now responsible in particular for the further development of controlling in terms of planning and control instruments and the internal data and key figure systems. It advises the Executive Board in the design and implementation of the University-wide strategy in these areas.

Working together with the Main Women’s Representative, Equal Opportunities Controlling supervised the implementation and development of the TU Berlin gender equality concept and the women’s advancement plans of the individual administrative units during the reporting period. It also provides various administrative units with comprehensive data sets on an annual basis as well as advice in implementing their plans.

An especial focus of the work performed during the reporting period was placed on the diversity strategy agreed in 2019, its establishment at TU Berlin, and its interlinking with gender equality and internationalization. The launch of the diversity strategy represents the start of a new process for implementing a diversity mainstreaming process at TU Berlin. The diversity working group established in 2018 networks the various stakeholders involved in this area and both provides ideas for and advises on diversity and anti-discrimination and all the issues involved in the diversity strategy. In addition to implementing the TU Berlin diversity strategy, the working group is currently involved in developing measures for the prevention of and protection against discrimination.

The platform for the implementation of research-oriented gender equality standards of the German Research Foundation

The platform for the implementation of research-oriented gender equality standards of the German Research Foundation was established to promote co-ordination between central and decentral units of the University, to develop the strategic position-
The following issues were discussed during the reporting period and recommendations were made to the Executive Board and other bodies and stakeholders:

- Qualitative reports on the research-oriented gender equality standards of the German Research Foundation
- Development of the Berlin Equal Opportunities Program
- Interfaces to the Excellence Strategy or the corresponding interdisciplinary topics of the Berlin University Alliance
- Further development and implementation of the diversity strategy
- Development of a compensation program to enable women to perform committee work
- A gender bias training concept for the appointment committees

**Center for Interdisciplinary Women’s and Gender Studies**

During the reporting period, the Center for Interdisciplinary Women’s and Gender Studies appointed Professor Hanna Meissner to the W3 professorship for Interdisciplinary Women’s and Gender Studies on 1 January 2020 within the scope of an early successor appointment procedure.

Moreover, the Office for the Skills Network of the Working Group for Women’s and Gender Studies Units at Berlin Universities (funded by the Berlin Senate), anchored in the Center for Interdisciplinary Women’s and Gender Studies and in receipt of infrastructural funding provided by the German Research Foundation, has joined forces with the Gender Studies Centers at Humboldt-Universität zu Berlin and Freie Universität Berlin to establish the first ever digital repository for Gender Studies: GenderOpen.

External funding (from the German Research Foundation, the Federal Ministry of Education and Research and the Volkswagen Foundation) has been acquired on a large scale. The Center for Interdisciplinary Women’s and Gender Studies has been involved in the DFG research unit “Law – Gender – Collectivity: Processes of Standardization, Categorization and Solidarization” since 2018. The Center for Interdisciplinary Women’s and Gender Studies is involved in the DiGiTal program funded by the Berlin Equal Opportunities Program with two of its own projects. The Center also holds a leading position in the establishment of the Diversity and Gender Equality Skills Network (DiGENet) within the scope of the Berlin University Alliance (BUA).

**Family Services Office**

The Family Services Office is the central point of contact for all questions regarding balancing work or studies with family or care responsibilities. It provides professional advice to all status groups, develops and organizes support services for those with family responsibilities, and guides PR activities relating to the topic of balancing work and studies with family or care responsibilities. It is also responsible for the project coordination of the family-friendly university audit and is involved in developing implementation strategies for promoting balancing work and studies with family or care responsibilities at TU Berlin. A series of new measures were implemented within the reporting period all with the aim of changing the prevailing culture.
An important aspect is PR work, which seeks to raise awareness of this topic amongst all status groups in TU Berlin. It uses two formats to achieve this: “Lunch talk between nappies and academia” (an information event in collaboration with TU-DOC), an Instagram story, presentations, e.g. at “Tutor Plus.” TU Berlin has worked together with voio, a holiday childcare agency, since 2019 and which provides childcare services throughout the year. Since the onset of the pandemic, TU parents are able to take advantage of a further range of virtual and free-of-charge services. Feedback about these services was positive, as parents have found the double burden of working from home and childcare to be strenuous. During this period, the Family Services Office initiated the “virtual summer challenge” for the children of TU staff and students.

Use of the advice service has increased to a significant degree, with inquiries coming in about emergency childcare during periods in which schools and childcare facilities have been suspended. TU Berlin reacted with a range of options for paid leave. The Family Services Office regularly updates its homepage with advice and support information for parents and those with care responsibilities. This was supplemented by the call “equal opportunities for academics.” A range of measures were implemented to lighten the load for academics with family responsibilities. A working group has been established to create the framework conditions for successful mobile working.

Students with children can take advantage of a range of virtual networking events with the aim of supporting parents with children. The flexible childcare service is a fixed part of our portfolio and is very popular amongst staff and students alike. Working together with the Academic Advising Service, guidelines were drawn up and published setting out how students can access academic adjustments. This area is becoming increasingly internationalized, with standardized processes and information developed for international members of TU Berlin with families.

**Dual Career Service (DCS)**

The TU Berlin Dual Career Service was established in 2012 as an instrument of strategic recruitment for newly appointed professors and managers in the administration as well as the promotion of women and family. The need for this new service was made clear by the realization that the career path decisions of highly-qualified applicants are increasingly dependent on the level of opportunity presented to their partners to pursue their careers in the new location and to ensure that their family can establish a life in Berlin. Responding to this need, the Dual Career Service provides a range of advice and support services to the partners of newly-appointed members of staff regarding career, childcare, schooling and life in Berlin.

The most important developments in the Dual Career Service from 2017 to the start of 2021 are: 1) The establishment and anchoring of the dual career network Berlin-Potsdam (HU, FU, TU, Uni Potsdam, BerlinPartner) to ensure shared support services for newly-appointed staff, 2) The extension of the networking activities relating to the relevant institutions in Berlin and the dual career network in Germany, 3) The inclusion of ERC grantees in this process, 4) The revision, modernization and complete translation of all DCS materials to project a professional public image, and 5) The involvement of the Berlin University Alliance in the process for implementing the Dual Career Fund.
10.2 Audits and prizes

Total Equality Award

Following on from 2008, 2011 and 2014, the University once again received the Total E-Quality Award in 2018. Within the scope of this distinction, TU Berlin was also awarded the newly-created Diversity Award, by Total E-Quality Deutschland e. V., intended to encourage organizations to take the initiative in implementing equal opportunities. The jury explained its decision as follows:

“TU Berlin demonstrates a clear commitment to promoting diversity, anchored for example in its future concept, plans for the advancement of women, target agreements and mission statement. This is underscored by a range of prizes and program funding measures: the family-friendly university audit (last in 2018), the Berlin Equal Opportunities Program (2001-2020) and the signing of the Diversity Charter 2013. [...] TU Berlin is pioneering innovative new paths in this area, with target-group specific measures. In sum, TU Berlin has clearly set itself apart from other universities in this sphere.

Family-friendly university audit

Certified as a family-friendly university since 2008, TU Berlin is permitted to use the “family-friendly university audit” seal of quality awarded by berufundfamilie Service GmbH. Since then, the University has been re-audited every three years. The last re-audit was in fall/winter 2014. TU Berlin is currently engaged in the dialog re-auditing process which replaces the reporting process.

TU Berlin has submitted a new action plan for 2021-2024 focusing on care duties, mobile working practices and family-conscious management to berufundfamilie Service GmbH for evaluation. The action plan was developed by a number of TU Berlin members under the supervision of the Family Services Office. We expect the results on 15 March 2021.

In view of the specifications of WissZeitVG, TU Berlin is attempting to find satisfactory solutions for situations in which research associates employed via third-party funding require leave to attend to family responsibilities. The family-friendly university steering group is currently addressing this issue.
Outlook
In 2020, the pandemic forced TU Berlin to move quickly, improvise, and select innovative and bold responses to the challenges it presented. Changes on this scale would normally have been tested within a pilot project. However, recent events have forced the entire University to undergo a massive pilot project, such as when switching to working from home.

The experience gained by TU Berlin in the move to working from home has reinforced our conviction that mobile working practices are a central element of any modern working environment in the post-COVID future. Mobile working is more than just working from home; it can include rail travel, at home with parents needing care, and other locations. Only a year ago, we were drawing up plans to enable staff to take advantage of mobile working for single days in the year, for example on days on which they were expecting a handyman to come to their home. Now, TU Berlin is convinced that a range of working areas are suitable for staff to work mobile for up to two days a week. We are currently working on solutions for staff whose working practices – for example needing to access large volumes of paper files – make mobile working more difficult.

TU Berlin is taking its first steps in a new working world and mobile working will not be the only legacy of the pandemic year. TU Berlin is set to celebrate its 75th anniversary in 2021. We can look back on a great history and an exciting future. We are planning a virtual conference in early 2021 entitled “Universities as the Shapers of the New Normal” to mark this event. Universities will not return to working exclusively in offices and lecture halls. When we return to normalcy, the world we find will be more modern, better and fairer.

Another very important topic for the future is our climate. All experts agree that the climate will pose one of the greatest challenges of the coming decades. Working together with a range of partners from Berlin and Brandenburg, TU Berlin has launched its Climate Change Center to make a contribution to addressing climate change. Researchers at TU Berlin are working in a range of areas which, taken together, are of relevance for the issue of climate change, including the transformation of our energy systems, new forms of mobility and climate-friendly urban development and sustainable construction practices. The combination of the metropolis of Berlin and Brandenburg, a large sparsely-settled region, represents a unique real world laboratory and makes the region ideally-suited to the development of such a climate center.
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